Head Office: Università degli Studi di Padova

Department: Filosofia, Sociologia, Pedagogia e Psicologia Applicata (FISPPA)

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The relationship between the student-centered approach and students' competence development in higher education: case studies in Italy and China

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Coordinator: Prof. Michele Biasutti
Supervisor: Prof. Cristina Zaggia
Co-Supervisor: Prof. Hui Liu

Ph.D. student: Jiahui Li

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Declaration

I would like to declare that the doctoral thesis was original research, which is a result of my investigation and research while supervised by Professor Cristina Zaggia. No conflict of interest, degree, and funding exists in the thesis.

Abstract

Transitioning to competence-based teaching and learning has been one of the main challenges confronting universities in recent years due to the increasing concerns and demand for students' competence development. Given that, there is a growing interest in finding strategies to develop students' competence effectively. The student-centered approach has always been recognized as an effective teaching and learning strategy because of its positive consequence for meeting the needs of stakeholders and the quality of student learning. In this context, this cross-cultural study explores what and how the student-centered approach impacts university students' competence development in Italy and China.

With this aim, a historical perspective is first employed to examine the development of the concepts and policies evolution of student-centered approach and competence, and analyze how these policies impact the practice under the European and Chinese cultures. A systematic review and analysis are conducted to identify the influential factors promoting students' competence development under the student-centered approach, laying the groundwork for constructing the empirical survey instrument.

This study adopted the case studies with mixed methods. Data were collected from eight cases in Education with Bachelor's and Master's degrees from Italian and Chinese universities. The structural equation models were constructed using quantitative data to prove our hypothesis. The results revealed evidence of a positive effect of the student-centered approach on students' competence development within various factors, and the comparison in two contexts was discussed. Moreover, based on the analysis of qualitative data – the stakeholders' perspectives in two different cultures, the study deduced the student-centered concepts, summarized teachers' practical experiences in promoting students' competence development, and analyzed the role of course design, activities, delivery, assessment, and institutional support, developing a holistic understanding.

The results provided a deeper understanding of the beneficial role of the student-centered approach on students' competence development in the Italian and Chinese university context and offered more nuanced theoretical insights into the worldwide literature on this topic. Practical suggestions were presented for implementing the effective student-centered approach in a university course.

Overall, given the results of this comparative study, there is no unified formula for applying the student-centered approach to develop students' competence. On the contrary, teachers and students perceive and apply it differently in distinct contexts. The Chinese philosophy of '*ge mei qi mei, mei mei yu gong*' (respect one's own culture, and appreciate the culture of others for harmony and prosperity) provides us with some implications.

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BFUG	Bologna Follow-Up Group
CNKI	China National Knowledge Infrastructure
ECTS	The European Credit Transfer and Accumulation System
EHEA	European Higher Education Area
EI	Education International
ENQA	The European Association for Quality Assurance in Higher Education
EQF	European Qualification Framework
ESG	Standards and Guidelines for Quality Assurance in the European Higher Education Area
ESIB	European Student Information Bureau
ESU	European Students' Union
ETUCE	European Trade Union Committee for Education
EUA	European University Association
MOE	Ministry of Education, The People's Republic of China
OECD	Organization for Economic Co-operation and Development
QA	Quality Assurance
UNESCO	United Nations Educational, Scientific and Cultural Organization
WoS	Web of Science

Content

Chapter 1 Introduction

1.1 Research background

The context in which higher education is operating today has changed considerably compared to the past. In the context of global changes and increasing complexity, increasing attention is being paid to the university's quality of teaching and learning (Devlin, 2007a; Marginson, 2007; Shin et al., 2015). The factors affecting the quality of teaching and learning involve a ton of aspects. Externally, the forces of complex social, economic, political, technological, and demographic changes, and internally, institutions, teachers, and students have their specific contextual influences, especially the teaching and learning approaches, emotions, classroom atmosphere, and students' motivation and so on. These forces are intertwined to promote changes in teaching and learning in higher education.

In the first place, with the growing impact of globalization, the economic and social environment has given increasing attention to the efficiency and effectiveness of higher education and has focused on developing the students' skills to meet the needs of economic and social development (Naidoo & Jamieson, 2005; Pollitt & Bouckaer, 2011). Especially in developing and industrialized countries, it is now widely recognized that high-quality higher education is essential for developing economies to get rid of the periphery of the world economy (Task Force on Higher Education, 2000). The university has been positioned as an important place for the production and international dissemination of economically productive knowledge, innovation, and technology (Carnoy, 1994; Naidoo, 2008). In terms of teaching and learning, the challenge of today's higher education is not only to impart a large number of domain-specific frameworks and subject insights to students but also to cultivate the skills that make them versatile experts in their fields and lifelong learners (Asikainen & Gijbels, 2017; Rieckmann, 2012). Additionally, there is evidence that the competence-based and student-centered approach are essential for serving the demands of a diverse student population (Capone, 2022; Henri et al., 2017). Therefore, universities are required to equip a large proportion of the population with advanced skills that can be effectively used in the knowledge economy. It can be informed that universities are facing the growing pressure to impart to students not merely the knowledge, skills, and personality, but also the ability to learn how to learn to continuously improve their skills so that they can meet the requirements of the changing global economy. For achieving these goals, the more effective teaching and learning in higher education are expected to enable students to participate in deep learning approaches and develop in the direction of more meaningful and critical learning, rather than just duplicating knowledge (Asikainen, 2014; Biggs, 2011).

Second, since the 1980s, along with the rapid expansion of higher education worldwide, a significant concern and challenge is quality, so higher education is facing increasing demands for teaching excellence and quality education (Mok, 2005; Nicholls, 2002). For a long time, most international higher education ranking systems have concentrated on the institutions' research achievements or mechanical use of learning outcomes, which have shown to be misleading as indicators of relative or absolute quality (ETUCE Policy Paper, 2014). However, the perspectives on quality in higher education and the standards for measuring universities are gradually changing. In the mission of universities, it is realized that disseminating knowledge and preparing students for creative and critical thinking are as important as creating knowledge. As the Group on the Modernisation of Higher Education rightly pointed out in the report submitted to the European Commission, "good teaching, unlike good research, does not lead to easily verifiable results, but

in a process" (High Level Group on the Modernisation of Higher Education, 2013, p. 36). Therefore, people have been exploring the most valuable ways to improve higher education's teaching status, encourage high-quality teaching and learning, value the development of students' skills, and focus on student learning experience instead of "racing for the best score" among academics.

Third, sustainable development is one of the priority themes of the 21st century, the needs and trends of which have drawn further attention to the development of students' competencies. Universities can play an important role in shaping the future of the world society in terms of sustainable development "by solving sustainability issues through the main functions of education, research and outreach" (IAU, 2010). In other words, it means universities can create a specific learning environment where students can improve and develop their knowledge and abilities, thereby contributing to society toward sustainable development in the future. Existing data show that experts regard "creating and changing values, attitudes and awareness" and "developing competencies" as the most important objectives of education for sustainable development, and examine the pedagogical approach to advancing competence development (Lozano et al., 2019). However, European experts pay more attention to "the transmission of knowledge and understanding," while Latin American experts attach more importance to the ability to cooperate (Rieckmann, 2012). Regardless of the desired competency, it can only be acquired through learning; hence, sustainable development must be understood as a learning process (Vare & Scot, 2007), and the student-centered approach has been identified as a central component of education for sustainable development (Komatsu et al., 2021). Higher education is required to produce work-ready graduates, and given the scholarly nature of higher education, part of that should be the development of deep approaches to learning (Lake & Boyd, 2015). In this sense, essential is a new learning culture, which will further value the development of students' competence.

Last but not least, there has been a shift from teacher-centered to learner-centered education in the past years (Cole-Onaifo, 2022; Reynolds & Miller, 2013). There has also been a change from content-centered curricula to competence-centered curricula (Bergsmann et al., 2015; Zhao & Tröhler, 2021). The competency-based and student-centered approaches are essential topics in educational research and practice, especially in the European Union. The creation of the European Higher Education Area (EHEA) has prompted the need to advance the understanding of student-centered learning, knowledge acquisition and competence development. Numerous European institutions are undergoing a transformation in which the development of students' competence becomes the central axis bridging the teaching-learning process to ensure that students can face their careers more successfully (Hernández-López et al., 2016). In this sense, the student-centered approach, an outgrowth of constructivism, consider that students construct their understanding via their actions and experiences, which has given rise to a variety of active teaching and learning methods and fostered the development of students' competence (Ali, 2019; Serin, 2018). Furthermore, the education paradigm focusing on the student and his learning activity spurred changes in designing and structuring the educational process, including reaching learning outcomes, cultivating competencies, teaching techniques, and assessment (Frasineanu & Ilie, 2017). As the theory of the student-centered approach enjoys burgeoning advocacy for application worldwide, it is pertinent to note that Italy and China have devoted themselves to catering to this trend, but there are still challenges in translating theory into practice (Rapanta, 2021; Wagenaar, 2014).

Therefore, It can be seen that the changing forces related to teaching and learning in higher education come from many aspects, and almost all stakeholders are very concerned about how to improve the quality of teaching and learning, particularly in teaching and learning approaches and the development of students' competence. Faced with the changing context, the EHEA has responded through a series of profound transformations and radical changes in the principles and structures. As Zaggia (2008) said, if the first revolution of the European university was that which introduced the study cycles and the credit system, in fact, the second is precisely that of learning outcomes and skills. According to the ENQA document (2005) on Standards and guidelines for quality assurance, the Tuning Educational Structures in Europe project (2003), in which the definition, training and evaluation of learning outcomes are considered important indicators the quality of a course of study, and stating the level of competence should be expressed in terms of learning outcomes. In the case of Italy, the ministerial decree of 26 July 2007 defining the guidelines for the establishment and activation by universities of study courses. It required that the definition of the competences to be ascertained at the end of the study programs and of the courses was included among the minimum requirements, which is necessary for the establishment and activation of university training courses. Moreover, the year 2015 was an important year for *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG). The growing demand for skills and competences in Europe requires higher education institutions to respond to this situation in new ways. The original text in 2005 was updated to reflect the progress of quality assurance and other Bologna action guidelines, such as the qualification framework, qualification recognition and promotion of the use of learning outcomes with a shift towards student-centered learning and teaching (ESG, 2015). After that, student-centered learning has entered center stage on the European higher education policy agenda. It has become the key principle underlying the intended reforms toward enhancing the quality of teaching and learning in European Higher Education. Moving toward student-centered approach will lead to greater success for students and increased job satisfaction for teachers is supported in the pedagogical literature (McDavid et al., 2018). Despite the universal appeal, student-centered learning remains poorly defined in policy documents and this ambiguity potentially jeopardizes its implementation (Hoidn & Reusser, 2020; Jambor & Habanik, 2017).

In the past few decades, China's socioeconomic transformation and prosperity have resulted in significant changes in higher education. As China's higher education enters the universal stage, the development strategy has changed from extensible development with scale expansion to connotative development with quality improvement (Liu, 2014; Pan & He, 2019). The Ministry of Education (MOE) has issued several documents to emphasize the importance of talent training quality and students' competence development, and the move toward student-centered teaching and learning reform. For example, in 2012, the *Twelfth Five-Year Plan for National Education Development* released by the the MOE pointed out that talent training is the central mission of universities, and teaching is the main content of teachers' evaluation, to fully mobilize students' enthusiasm and initiative. In 2016, the *Guidance on Deepening Educational Teaching Reform in Universities under the Central Government* promulgated by the the MOE proposed promoting student-centered changes in teaching and learning approaches, emphasizing enhancing students' social responsibility, innovative spirit, and practical skills. In 2019, the *Notice on Implementing the "Double Ten Thousand Plan" for Construction of world-class Undergraduate Disciplines* once again mentioned adhering to the belief of being student-centered, stimulating

students' learning interests and potentials, and enhancing the spirit of innovation, practical skills and social responsibility (MOE, 2019). However, there has been slow progress in involving students in the teaching-learning process as both beneficiaries and implementers (Tsegay, 2015). Since each student does not embrace them to participate in course interactions equally, the teacher's guidance is critical and could significantly affect their participation and move to higher-order learning (Zhao et al., 2021). Despite facing various challenges, with the advancement of the student-centered approach, students have gradually experienced some benefits even in large classes, including improving their cognitive and practical skills and applying knowledge to real-world problems (Wang & Zhang, 2019).

In recent years, to better prepare students for a career, institutions have attempted to make students equipped with both hard skills and soft skills in recent years (Gruzdev et al., 2018). Many strategies have been provided, such as creating learning settings (Zhang et al., 2021), refinements of course design (Awidi & Paynter, 2019), changing teaching and learning approaches (Guo et al., 2020), and using new educational technology (Dunn & Kennedy, 2019). There are also many studies on students' learning, teaching and learning methods and competence development, such as those conducted by scholars Biggs, Bloom, Entwistle, Trigwell, Etc., which also have been the focus of teaching and learning transformation during the past two decades. Although it is realized that the student-centered approach is more conducive to student learning, the traditional teacher-centered approach has still dominated (Englund et al., 2017). Hence, these skill-related goals are not easy to achieve. Darling-Hammond (2000) pointed out that universities have little effect on student performance, while substantial differences are mainly attributed to their teachers, and the classroom is always an important site for teaching and learning. For these reasons, this study intends to go deep into exploring how the student-centered approach plays a role in competence development.

1.2 Research questions and objectives

Incorporating students' competence development into curricula requires systems thinking and calls for pedagogical innovations that provide interactive, experiential, transformative deep learning are worth studying. Most efforts to integrate student competency development into the course have focused on curriculum design, delivery, or learning outcomes (Biggs, 2011; Biggs & Collis, 2014; Supena et al., 2021; Villarroel et al., 2018). To better improve the quality of teaching and learning in the course, in previous studies, research on competency-based curriculum, student-centered approach or competence development has flourished respectively, though there have been some exceptions: for example, the connections between pedagogical approaches, knowledge domains, and four key competencies (Wright, 2011); connecting competences and pedagogical approaches for sustainable development in Higher Education (Lozano et al., 2017); the association between flipped classroom and knowledge, skills, and engagement in higher education (Murillo-Zamorano et al., 2019); students' skills between conventional learning and blended learning (Hadiyanto et al., 2021). Despite these examples, there is still limited research linking how teaching approaches affect students' competence development. Consequently, the question remains open on how students' competence developed by changing the traditional teaching approach in universities and how the learning outcomes can subsequently be assessed (Adomssent et al., 2007; Barth & Rieckmann, 2016; Sutiani, 2021). Further research is needed. This paper aims to prove whether there is a connection between the student-centered approach and

students' competence development, providing a framework to link the two and, in turn, providing a reference for teachers to cultivate competent students.

1.2.1 Research questions

Through the literature review and analysis of various research, there are a number of elements to take into account when searching for the subject of the student-centered approach and students' competence, especially the lack of precision in the key concepts, the diversity of student skills, the transformation of the role of teachers, different views of teaching and learning in the course, the implementation of evaluation, and so on.

In terms of terminology, the concepts of higher education quality, effective teaching, best teaching approaches, and students' competence have appeared more and more frequently over time, but there is still no standard definition (Harvey & Newton, 2007; Motjolopane, 2021; Pirsig, 1999; Ryan, 2015; Trigwell, 2001). Moreover, these definitions are constantly updated and developed. For example, quality is no longer perceived as being done to stakeholders, but by stakeholders. (EUA, 2014). In this sense, these definitions depend on specific objects, conditions, characteristics, and other contextual factors. Thus, it is necessary to contextualize and explain the key concepts of student-centered approach and competence in the study.

There have been numerous studies on how teachers conduct teaching, student learning, and studying methods in the past two decades. Some academics have noted that the emphasis of teaching reform during this period lies in the innovation of teaching approaches, promoting students deep learning and engagement, fostering students' skills, etc. (Grant & Baden-Fuller, 2018; Lee et al., 2014; Pittich & Ludwig, 2022). In this context, many specific teaching and learning approaches like problem-based learning and flipped classrooms are deeply studied, and students' competence development like professional skills and teamwork are extensively discussed. However, although collaborative and constructive teaching approaches have become more common in higher education in the past twenty years, the lecture model has still dominated (Budiman et al., 2021). It is evident that teachers' deep-rooted beliefs are tough to shake up, and taking steps toward teaching and learning change still has a long way to run.

Moreover, there are many practical tools for understanding how teachers cope with teaching tasks and how students perform learning tasks, such as the Study Process Questionnaire (SPQ), the Approaches to Studying Inventory (ASI), the Approaches to Teaching Inventory (ATI) and its various forms and derivative forms. Whereas the teaching and learning approach, in essence, is a way to realize the goals; that is, goals are the desired outcomes that students obtain in higher education. In general, these outcomes are diverse, depending obviously on different situations. The intended learning outcomes include knowledge, development of advanced cognitive skills, social skills, employability, etc (Bloom, 1956; Khalaf et al., 2018). These are gradually being valued (Kuh, 2019). The student-centered approach is promoted as a teaching and learning approach that can enhance student learning outcomes. Our research will construct a survey instrument to determine how different modes and framing of student-centered approach played a role in students' competence development.

Therefore, faced with this panorama, we ask ourselves some fundamental questions to start searching for knowledge. The students' competence is required to be continuously improved to cope with the new challenges emerging globally, so is there a new kind of methodology to deal with it in daily class? If the teachers encourage the student-centered approach, how could teachers

train the talent, guide them to reach the learning outcomes, and develop their competence? In this regard, we put forward the general question: What and how does the student-centered approach impact the students' competence development in higher education? And the hypothesis: There is a close and positive relationship between the student-centered approach and students' competence development.

And based on the current general topic, four specific research questions are developed:

a) What is the student-centered approach and competence from policy documents and stakeholders?

b) In the student-centered course, what factors influence students' competence development?

c) Is there any structurally intrinsic relationship between the student-centered approach and students' competence development?

d) As for students, which factors are more effective or could motivate them? Regarding teachers, what is the structure of the student-centered course, and how did they do? In terms of the institutions, what efforts have been made to construct systems and culture?

1.2.2 Research objectives

Considering the general question mentioned above, we arrive at the overall objective of exploring how teachers design, implement and evaluate the student-centered course, thereby impacting student competence development. Accordingly, we try to construct frameworks or models, and make suggestions to improve teaching and learning quality. And the four specific objectives corresponding to the particular questions are posed as follows:

a) Identify the concepts of student-centered approach and students' competence from literature, policies and stakeholders' perspectives.

b) Define the factors that the student-centered approach affects students' competence development and construct the survey instrument.

c) Explore the different structurally intrinsic relationship between the student-centered approach and students' competence development based on Italian and Chinese cases.

d) Develop a holistic understanding from the stakeholder's view (students, teachers and institutions).

This study hopes to make contribution to debate and reflection on the deeply ingrained teaching method, encourage and deepen the students' competence development to deal with society's challenges, and pave the way to further study of teaching and learning reform. The study adopted the cases of Italy and China as the samples. Both Italy and China have distinct ways of promoting the student-centered approach and developing students' competence. In other words, there is no single path that every country, even every institution or teacher, should follow. As the saying goes, all roads lead to Rome. However, it does not mean we cannot learn from each other. On the contrary, learning from each other's talents and overcoming our limitations is the direction we have been working on. In order to respond to the questions and meet the objectives, an attempt is made to interpret them, contextualize them, and demonstrate their linkages.

The significance of this three-year comparative research on the relationship between the student-centered approach and students' competence development can be summarized in three aspects. Firstly, enrich our comprehension of the student-centered approach and students' competence. According to Hoidn and Reusser (2020), the student-centered approach is often criticized as a fuzzy concept that refers to a vague assortment of concepts and ideas. Numerous

researches have been conducted to define and understand the student-centered in different countries, while the definition of the term is still evolving. Competence demonstrates a parallel pattern. Several studies approach this terminology from different perspectives and different words, And Telling and Serapioni (2019) reinforced the idea of the nebulous and context-dependent nature of the concept. Given that, to define the concepts more clearly, the current study can be considered a beneficial supplement. Secondly, exploring the impacting elements and intrinsic relationship of student-centered approach and competence development could further improve the teaching and learning in theory and practice. Last but not least, regarding this topic, the comparative study of Italy and China is uncommon, and the study tries to fill the research gap. Current research intends to compare the relationship between the student-centered approach and competence development from cases of these two totally diverse contexts countries. It is of particular significance because previous studies on our issue typically focused on a single component or compared Italy to other western countries. However, comparative research between Italy and China is still rare. Hence, the study can also be viewed as a good opportunity to open a dialogue between Italy and China.

1.3 Research procedure

Commonly, the study tends to start with the concept, going back in history and placing the object of study in a specific context for analysis (Hjørland, 2009). Through the literature review, the researcher decomposes the observable variables within and between concepts, so as to conduct a comprehensive analysis of the research question (Jaakkola, 2020). This study's content and process are in detail to make the research procedure clearer and more logical, as Figure 1 shows.

In the first step, based on the literature and policy analysis, we will focus on defining key concepts. Through the policies and documents in Italy and China, the study examines the historical development of student-centered approach and competence concepts, and analyses their connection within policies. For Italy, the initiatives are mainly guided by the European Higher Education Area and other European stakeholder organizations, like European Association for Quality Assurance in Higher Education (ENQA) and the European Commission. While in China, the Ministry of Education is primarily responsible for releasing related policies. Thus, the study tries to identify the concepts and provide a historical overview of the concepts' development in the context of Europe and China. And it constitutes the main content of Chapter 2 and portion of Chapter 3.

The second step primarily concerns the factors which promote students' competence development from the student-centered approach in the course. Before defining the factors, the study reviews the alignment of student-centered approach, learning outcomes and students' competence development based on theory. And the assessment of competence is discussed. Finally, to define the factors more reliable, conducting a systematic review and analysis is necessary, thereby laying the groundwork for constructing the survey instrument. And above is the core content of Chapter 3.

From the third step, the study transitions to the quantitative part of empirical research, which was conducted in the Italian and Chinese contexts. Chapter 4 predominantly focuses on the research methodology and methods. Based on the research questions and goals, case studies with mixed methods research design is chosen. Furthermore, the concrete research methods, sample, instrument design and questionnaire pre-testing are presented in detail. Subsequently, Chapter 5

largely concentrates on the intrinsic relationship between student-centered approach and competence development in accordance with analyzing the quantitative research results from a comparative perspective. The study attempts to construct the structural equation models of relationships based on the Italian and Chinese cases, respectively, and the comparison is discussed.

The final section, in Chapter 6, is devoted mostly to deducing the student-centered approach role in the students' competence development from the stakeholders' words, which is based on the analysis of qualitative research findings. Based on the constructive alignment theory, this component compares and explores Italian and Chinese variations from the student-centered concepts, course design, delivery, assessment and institutional support, developing a holistic understanding and providing some implications on "how to foster the students with competence during the course." In the end, the conclusion chapter principally provides a summary and discussion of the study, including the limitations, implications for future research, and the challenges encountered in surveying during the pandemic.

Objectives	Methodology and methods	Intended research results
Examine the relationship of how SCA affects SCD	Case studies with mixed methods	Compared the cases in Italy and China, construct the models of SCA and SCD, and develop a deeper perception of the relationship.

Specific research content

Component 1: The concepts and previous studies of SCA and SCD	Literature review Semi-structured questionnaires and interviews	Identifying the concepts of SCA and competence from literature, policies and stakeholders' view
Component 2: Defining the factors that SCA affects SCD.	Literature review	Summarize the influencing factors based on literature review, construct the instruments
Component 3: Explore the intrinsic relationship between SCA and SCD	Semi-structured questionnaires	Construct the structural equation model of the relationship between SCA and SCD
Component 4: Deduce of the SCA role in the SCD from the stakeholders' words	Open questions and interviews	Consider the views of students, teachers and institutions, and develop a holistic understanding

Figure 1. Overall research procedure

Note. SCA = Student-centered approach; SCD = Students' competence development

Chapter 2   The shift to student-centered approach and competence development in higher education

This chapter focuses primarily on key issues in the field of student-centered approach, providing a theoretical research background for investigating the relationship between student-centered approach and students' competence development. First, I will examine the historical context and evolution of the term student-centered approach from a historical standpoint. In doing so, I differentiate the relationship between the teacher-centered and student-centered approaches and a relatively thorough understanding of the student-centered approach. Secondly, I explore the different methods to achieve the student-centered approach within different concepts. Thirdly, based on policies and documents analysis in Europe, Italy and China, the development of the student-centered approach, the concept of competence, and the changes in its relationships within the specific context are investigated. At long last, a summary and discussion will be drawn, and the value of current research in understanding the research questions is indicated.

2.1 The historical and theoretical foundations of the student-centered approach

The student-centered approach has a lengthy history, dating back at least to Jean-Jacques Rousseau (1712－1778), who placed his student Emile's intrinsic interests at the center of his education. In his point, the teacher's role was to motivate students' learning by tapping into their interests and considering their capabilities (Rousseau, 1979). Besides, the thoughts of a number of notable educational philosophers and scholars have led to fresh insights into how students learn, such as progressive education (Dewey, 1938), theories of humanism (Rogers, 1951), theories of cognitive development (Piaget, 1950), and constructivist theories (Biggs, 1996; Kuhn, 1970; Vygotsky, 1978). These theoretical developments served as the student-centered approach's scientific foundation and practical direction. According to the literature, the constructivist theory is where the student-centered approach had its philosophical roots. However, constructivist theory should not be regarded as a single theory since it is derived and evolved from a collection of classical learning theories.

In the early 20th century, behaviorism declined and cognitive psychology rose to prominence. According to behaviorists, only observable, measurable, outward behavior merits scientific inquiry (Bush, 2006). Thus, they focused on learning as influenced by behavioral changes. When behaviorism as the foundational tenet of the teacher-centered approach, learning is viewed as a system of behavioral responses to physical stimuli, driven by reinforcement, practice, and external motivation (Skinner, 1974). It is assumed that effective learning involves the acquisition of desired behavioral responses by control of external stimuli, and that, within certain limits, the more intense and frequent the stimuli, the more effective the reinforcement (Staddon & Cerutti, 2003). In this regards, students are considered as relatively passive, and their conduct needs to be shaped through external reinforcement controlled by teachers (Skinner, 1953). And teacher is someone who conveys information properly and at the appropriate speed (Moore, 1997). Therefore, the learning process is perceived as a linear progression from "not understanding" to "understanding". Some critics posit that behaviorism is a one-dimensional approach to understanding human behavior that is solely concerned with how external forces influence behavior, without taking into account free will internal effects such as mental processes, minds, thoughts, and feelings (Moore, 2013). Accordingly, cognitive psychology progresses from the focus on such inner aspects.

Two major developments in early cognitive psychology were gestalt psychology and Piaget's stage of cognitive development theory. Gestalt psychology was developed from 1910 by three German psychologists, Max Werthemier, Kurt Koffka and Wolfgang Köhler, which noted cognition is the process of active processing of experience by the human brain (Köhler, 1967; Wertheimer, 1959). It gives rise to the view that the mind constructs all perceptions and even abstract thoughts strictly from lower-level sensations based on limited knowledge and experience (Wagemans et al., 2012). Hence, cognition is the process of experience construction and knowledge is the result of construction, which forms the foundation of constructivist psychology. However, the philosophical bias of the period caused behaviorists to disregard the value of gestalt psychology (Veysey, 1981).

The theory proposed by Jean Piaget, considered the modern pioneer of cognitive constructivism, is cognitive psychology's second most significant achievement. The theory of cognitive development proposed by Piaget (1936, 1950) illustrates how a child constructs a mental perception of the world. In contrast to previous ideas, he opposed the notion that intelligence is a fixed trait and instead viewed cognitive development as a process resulting from biological maturation and interaction with the settings (Alahmad, 2020). According to Piaget (1985), children learn and develop their intelligence through exploration of the surrounding world, constructing increasingly robust cognitive structures to comprehend objects and phenomena in schemas of "assimilation" and "accommodation." In this regard, assimilation and adaptation demand an active learner, not a passive one, since abilities like problem-solving skills cannot be taught, but they must be discovered. It implies that learners, motivated by a sincere desire to be meaning makers, are required to restructure new experiences in order to construct ever-larger knowledge systems based on existing knowledge structures in the form of schemes. Thus, cognition is a dynamic construction process, with the learning environment as a factor for cognitive development (Bandura, 1993). Applying the theory in the classroom, for instance, aligns with this perspective rooted in cognitive psychology, the discovery learning approach, which believes that students construct their understanding and knowledge of the world through experiencing things and reflecting on those experiences (e.g., Bruner, 1961; Mayer, 2004).

Based on the influence of Piaget's theory, Kuhn's theory about paradigm shifts in his seminal work The structure of science is regarded as another productive foundation when considering to student-centered approach (Jonassen, 2000). Kuhn (1962) argued that new paradigms emerge in the scientific area due to tradition-shattering revolutions in thoughts of a certain professional community rather than a step-by-step, cumulative process. In this sense, science is an ongoing process of discarding old theories and constructing new ones, as well as making choices and competing between old and new theories. Moreover, scientific revolutions could be seen as a social activity in which epistemological paradigm shifts within the communities of practice. A paradigm shift results in fundamentally altered ways of viewing and interpreting information (Koschmann, 1996). The paradigm shift in teaching and learning is akin to Kuhn's scientific revolution. For example, the notion of paradigms lays the basis for transformative learning, which is a profound, structural shift in the fundamental premises of thought, feelings, and actions (Mezirow, 1995; Transformative Learning Centre, 2004). In the face of uncertain information, it is necessary to undergo a holistic and radical mind shift, developing new cognitive schemas to guide future behavior (e.g., Barr & Tagg, 1995). These theories of cognitive psychology developing paved the way for the emergence of constructivist psychology, which contributed to the birth of

the student-centered approach. Apart from these developments, paradigm shifts in numerous domains over the twentieth century might be viewed as part of a larger shift from positivism to post-positivism. Awareness of this more significant shift contributes to breaking the dominance of positivism, the rise of post-positivism, and the ascent of hermeneutic and qualitative methodology (Jacobs & Farrell, 2001; Zammito, 2004).

Constructivism in education has origins in and evolved from epistemology, which is a theory of knowledge in philosophy. Within educational constructivism, three mainly distinct perspectives on cognition and learning can be identified in the existing literature: cognitive (or individual), social (or cultural), and situative (contextual). The student-centered approach is fundamentally rooted in these viewpoints. Constructivist education posits that knowledge is constructed by the human mind, rather than the result of objective observation (Bodner, 1986; Richardson, 2003). Learning is a process where students construct their new meanings based on the interaction of prior experiences and various activities in a given environment (Bada, 2015; Von Glaserfeld, 1995). Students are envisaged as active learners participating in meaning construction (Bada, 2015; Brown et al., 1989). Learning effectiveness depends on many factors, such as the students' initiative, the extent of participation, learning style, and so forth (Bostock, 1998; Mayer, 1999; Qureshi et al., 2021).

The social constructivism, strongly influenced by Vygotsky's (1978) work, suggests that knowledge is shaped not only by individuals, but also by social context (Bruning et al., 2004). It underlined that individuals generate meaning via their interactions with each other and their surroundings (Kalina & Powell, 2009; Palincsar, 1998). A case in point: collaborative learning is the process of sharing personal views, leading learners to co-construct new insights that cannot be done alone (Van Meter & Stevens, 2000; Weinberger & Shonfeld, 2020). Thus, learning is a social process (Kim, 2001). And humans produce knowledge, which is socially and culturally constructed (Prawat & Floden, 1994). McMahon (1997) held that meaningful learning takes place when individuals participate in social interactions (McMahon, 1997).

The situative constructivist perspective considers learning as essentially contextualized, with the goal to integrate the cognitive and the social constructivist perspectives on learning (Greeno, 1998). It highlights the significance of social and real-world aspects of learning activities, enabling students to engage in authentic practices, such as cognitive apprenticeship through activity and social interaction (Ackerman, 1996; Brown et al., 1989). Accordingly, situative approaches assume that knowledge is situated in the relationship between the individual and socio-cultural milieu (Collins & Greeno, 2011). Learners go gradually from novices to experts in a given field as they become immersed in a social environment, making them apply knowledge and skills flexibly in real-life settings.

Apparently, constructivism and its learning theories represent a paradigm shift for educators and instructional designers, to a vision of learning as necessarily more social, contextualized, conversational, and constructive than traditional transmissive views of learning. (Jonassen & Land, 2012). Constructivist theory informs numerous pedagogy, notably the student-centered approach. They generally believe that learning is achieved best through a hands-on approach, rather than being informed of what will happen and leaving students to make inferences, discoveries, and conclusions. With regard to the design of classroom activities and the instruction organization, teachers should take these aspects into account, providing students with opportunities to co-construct knowledge and acquire desired and applicable skills.

Furthermore, humanists are concerned with the "freedom, dignity and potential of humans," claiming that people are born with the potential to learn (Brockett, 1997). They disagree with the expert-led, lecture-based pedagogy, which views education as primarily the transmission of founded disciplines. In humanistic theories, the student-centered approach as an individualized learning process, analogous to personal development, serves to cultivate human potential and places emphasis on the process rather than the outcome (DeCarvalho, 1991; Rogers, 1951). Therefore, it is essential for students' active participation in learning in a bid to meaning learning. In the learning process, the humanist perspective advocates the "person-centered" classroom environment for teachers and students to learn together, as well as positive teacher-student relationships which inspire students' self-confidence, initiative, and active engagement (Hoidn, 2016; Rogers & Freiberg, 1994; Tangney, 2014).

There are two other academic disciplines whose advances have significantly impacted the introduction of the student-centered approach: brain science and neuroscience. Brain science and neuroscience knowledge contribute to the understanding of how the brain works – people build their minds throughout life by actively using their brain to organize and connect bits of isolated information (Hinton et al., 2012), bringing a profound understanding of effective learning and enriching pedagogical choices (Howard-Jones, 2014). Thus, the student-centered approach entails aligning instruction with how the brain learns, training students to attend to new information actively, and developing new neural networks through thinking, reflecting, collaborating, and so on (Doyle & Zakrajsek, 2019). When teachers comprehend how research on the mind and brain relate to the student-centered approach, they may be motivated to plan more diverse classroom support and scaffolding (Bruer, 1997; Chang et al., 2021; Schwartz et al., 2019). Moreover, research on the pubertal brain disproves the conventional belief that the brain ceases development in late childhood and indicates that adolescence is the second peak of brain development (Fuhrmann et al., 2015; Giedd et al., 1999). It has been commonly believed that the human brain matures by age 18, but in reality, the brain is fully developed until around the age of 25, after which it embarks on a period of decline (Pujol et al., 1993). Hence, seizing the critical window to develop college students' competence, especially their skills, values, and attitude, takes on special significance in the teaching and learning of universities.

In a similar vein, some other significant theories made substantial contributions during that period with the primary goal of improving teaching practice, such as Bloom's (1956) taxonomy of educational objectives, Gardner's (1987) theory of multiple intelligences, Chickering and Gamson's (1987) seven principles for good practice in undergraduate teaching, Etc. The development of all these theories and disciplines demonstrates that the traditional approach of the past has some pitfalls, and the university required a revolution in teaching and learning.

In addition, in the mid-1970s, interest in the student-centered approach gained particular momentum as a result of the global expansion of higher education and significant changes in society and the labor market: the diversity of students; the massification of higher education; the decline in quality of teaching and learning; and the rising expectations for students' vocation-readiness (e.g., Deboer, 2002; Moffett, 1970; Ramirez & Meyer, 2012). Some reports from the international academic community like the United Nations Educational, Scientific and Cultural Organization (UNESCO) started to call for shifting to the student-centered approach in colleges and universities, including but not limited to *Teaching and Learning: An Introduction to New Methods and Resources in Higher Education* (MacKenzie & Jones, 1970), *Learning to be:*

The World of Education Today and Tomorrow (Faure et al., 1972), *Methods and Techniques in Post-secondary Education* (Bligh et al., 1980), and *Learning: The Treasure Within* (Delors et al., 1996). Since then, the student-centered approach started to sweep the world, from institutions in the United States to those in Europe and Asia, with the goal of rethinking curriculum design, assessment practices, and the long-standing traditional approach to teaching in higher education.

Along these lines, political movements also opened up opportunities for the student-centered approach. A shift toward a more general, skills-based approach to higher education was sparked by the European Bologna Process, which identified student-centered learning and teaching mission as policy priority areas (Leuven Communiqué, 2009). Overall, based on professional development in academic, social impetus, teaching and learning reform in universities are gradually closing to the student-centered approach, despite the fact that it continues to be under scrutiny and challenge.

2.2 The different conceptions of the term student-centered approach

After reviewing the student-centered approach's historical roots and theoretical framework, there is no doubt that it has spanned nearly a century since Jean Piaget initially championed it in the 1930s. Since then, the term has rapidly elevated to buzzword status. Countless educators, scholars, and organizations have been advocating for student-centered classrooms. It has also been a global agenda in higher education since the 1990s. But what exactly does the student-centered approach entail?

Instead of being a simple concept, the student-centered approach is a complex and fuzzy notion that has covered a broad range of sometimes fundamentally distinct definitions, each of which has significant implications for education. Furthermore, the phrase student-centered approach is commonly used interchangeably with related concepts, such as "learner-centered approach," "student-centered learning," "student-centered instruction," "student-centeredness," and "student-centered paradigm," which are attributed to pedagogical concepts in which students and their learning are positioned at the center of the educational process, with the goal of fostering deeper learning processes and outcomes for students to become an active and lifelong learner (Hoidn, 2016, 2019). Despite the lack of a uniform definition, all proponents and academics agree that the student-centered approach is grounded on the philosophy that the student is at the center of the educational process (Attard et al., 2010). This section outlines what the term refers to in each perspective.

Although there are varying ways to interpret the student-centered approach, it is frequently contrasted with the teacher-centered approach since the former is a constructivist approach that presumes students actively participate in the construction of knowledge. The latter is a behaviorist approach in which teachers single transmit knowledge to their students, who are viewed as passive information receivers (Kain, 2003). Thus, the emergence of the student-centered in the 1930s was one of the results of dissatisfaction with the teacher-centered approach, which has received criticism for not or insufficiently fostering skills like critical thinking and problem-solving skill (Freiberg & Brophy, 1999; Lancaster, 2017). Compared to institutions of a century ago, today's classrooms are very student-centered, at least in the West (Kaput, 2018; Komatsu et al., 2021). Even if progress has been made, some universities still rely heavily on the teacher-centered approach, especially in much of the developing world (Muganga & Ssenkusu, 2019; Schuh, 2004). In this regard, As Biggs (1999) submitted, "many institutions and instructors claim to implement

the student-centered approach, but in reality, they do not." It is evident that the approach to teaching and learning has not been thoroughly transformed. Researchers naturally argue whether the new concept of student-centered is merely a linguistic shift or an entirely new transformative initiative (Keiler, 2018; Lea et al., 2003; Rapanta, 2021).

Voices responding to that can be easily found in numerous pieces of literature. Some scholars argue that the student-centered approach is perhaps most often understood in opposition to the teacher-centered approach, especially in the context (Lunenberg & Korthagen, 2005). Some suggest that they are different, and we need to make some distinctions regarding the philosophy, student motivation, student engagement, environment, student abilities, and others (Agrahari, 2016; Serin, 2018; Thamraksa, 2003). While others believe that the student-centered approach does not mean rejecting or substituting the traditional approach (Garrett, 2008; Hmelo-Silver et al., 2007). These two types of teaching and learning approaches should coexist and complement each other (Sawant & Rizvi, 2015). Therefore, in the following, we will begin by mapping the association and distinction between the student-centered and teacher-centered approaches.

Despite their seeming contrasts, we should be aware that the student-centered approach is not juxtaposed with the teacher-centered approach. Teacher-centeredness refers to the transmission of knowledge to students in an educational setting where the teacher is primarily responsible (Mascolo, 2009). Lectures are often used to disseminate knowledge to students, in which teachers are active and hold the ultimate authority, while students are passive. As Peyton et al. (2010) stated:

In a typical teacher-centered classroom, the majority of the time is spent by the teacher delivering the day's material and content on the whiteboard or overhead projector. During the lecture, students should take notes and ask questions. This process should be uncomplicated and untroublesome for students (p. 21).

In contrast, teachers who adopt the student-centered approach avoid direct knowledge transmission. The principal purpose of teaching and learning is to facilitate learning (Freiberg & Brophy, 1999). In this aspect, students actively participate in the learning process by attempting to make sense of what they are learning by relating it to their previous knowledge, discussing it with others, constructing understanding, and developing skills. Moreover, according to Barr and Tagg (1995), the student-centered approach is a paradigm shift, covering various dimensions, such as mission and purposes, criteria for success, teaching and learning structure, and so on. They provide a comprehensive comparison of the differences between the two paradigms, as summarized in Table 1. In the higher education area, in Weimer's (2002) book *Learner-centered Teaching*, she contrasts the practices of teacher-centered and student-centered college teaching in terms of (a) the balance of power in the classroom, (b) the function of the course content, (c) the role of the teacher versus the role of the student, (d) the responsibility of learning, and (e) the purpose and processes of evaluation. And these five criteria were further elaborated on by Wright (2011) and backed by numerous academics (e.g., Bean & Melzer, 2021).

Besides, the student-centered approach is an appropriate supplement to direct teaching. Whilst the student-centered approach implies that the student is the focal point of the process, the role of the teacher remains paramount (Seng, 2014). In the student-centered classroom, for instance, most students can not independently construct their understandings; instead, the teacher's assistance is necessary for doing so. Furthermore, some simplistically view the student-centered approach as active learning strategies and interactive pedagogical activities, and

the teacher-centered approach comprises unilateral lectures and exams. However, the student-centered approach is more than just classroom methods; it provides a horizon for the teacher-student-content relationship and environment (Trinidad, 2020). In this light, being student-centered does not imply abandoning lectures, since diverse learning outcomes require their appropriate pedagogical modes, which may include lectures and other didactic kinds of instruction – sometimes even necessary (Mascolo, 2009). Nevertheless, at the heart of the student-centered approach remains a view of instructors' active and deep learning designs, as well as students' autonomy and responsibility for learning (Arman, 2018).

Therefore, the terminology of the student-centered approach is not merely a linguistic shift, but an entirely new approach. Compared to the teacher-centered approach, the term student-centered approach is a broader vision as it encompasses more new content, distinct from but complimentary to, the conventional approach. Next, we transfer to another intractable question: What does the student-centered approach mean?

Table 1. Comparison of educational paradigms (Barr & Tagg, 1995)

The Instruction Paradigm	The Learning Paradigm
Mission and Purposes	
Provide/deliver instruction	Produce learning
Transfer knowledge from faculty to students	Elicit student discovery and construction of knowledge
Offer courses and programs	Create powerful learning environments
Improve the quality of instruction	Improve the quality of learning
Achieve access for diverse students	Achieve success for diverse students
Criteria for Success	
Inputs, resources	Learning and student-success outcomes
Quality of entering students	Quality of exiting students
Curriculum development, expansion	Learning technologies development, expansion
Quantity and quality of resources	Quantity and quality of outcomes
Enrollment, revenue growth	Aggregate learning growth, efficiency
Quality of faculty, instruction	Quality of students, learning
Teaching/Learning Structures	
Atomistic: parts prior to whole	Holistic: whole prior to parts
Time held constant, learning varies	Learning held constant, time varies
50-minute lecture, 3-unit course	Learning environments
Classes start/end at same time	Environment ready when student is
One teacher, one classroom	Whatever learning experience works
Independent disciplines, departments	Cross discipline/department collaboration
Covering material	Specified learning results
End-of-course assessment	Pre/during/post assessments
Grading within classes by instructors	External evaluation of learning
Private assessment	Public assessment
Degree equals accumulated credit hours	Degree equals demonstrated knowledge and

skills

Learning Theory

Knowledge exists "out there"	Knowledge exists in each person's mind and is shaped by individual experience
Knowledge comes in "chunks" and "bits" delivered by instructors	Knowledge is constructed, created, and "gotten"
Learning is cumulative and linear	Learning is a nesting and interacting of frameworks
Fits the storehouse of knowledge metaphor	Fits learning how to ride a bicycle metaphor
Learning is teacher centered and controlled	Learning is student centered and controlled
"Live" teacher, "live" students required	"Active" learner required, but not "live" teacher
The classroom and learning are competitive and individualistic	Learning environments and learning are cooperative, collaborative and supportive
Talent and ability are rare	Talent and ability are abundant

Productivity/Funding

Definition of productivity: cost per hour of instruction per student	Definition of productivity: cost per unit of learning per student
Funding for hours of instruction	Funding for learning outcomes

Nature of Roles

Faculty are primarily lecturers	Faculty are primarily designers of learning methods and environments
Faculty and students act independently and in isolation	Faculty and students work in teams with each other and other staff
Teachers classify and sort students	Teachers develop every student's competencies and talents
Staff serve/support faculty and the process of instruction	All staff are educators who produce student learning and success
Any expert can teach	Empowering learning is challenging and complex
Line governance; independent actors	Shared governance; teamwork

As we strive to inquire about the meaning of the student-centered approach, we must keep in mind that it continues to be viewed as a nebulous term (Hoidn & Reusser, 2020). Researchers from different perspectives, contexts, or theoretical frameworks, carry out multiple interpretations regarding the student-center approach. This term is ubiquitous throughout the pedagogic literature and books (e.g. Ali, 2019; Jones, 2007; Sandholtz, 1997; Zhang et al., 2021) and appears in many university strategic documents. However, it is still an elusive work to provide an explicit definition. Thus, we will examine the meaning of the student-centered approach from an overview standpoint. Then priority will give concrete interpretations of the student-centered approach emerging from the literature, based on analyzing different perspectives. Finally, the core values and the definition applied in our study will be put forward to close the debate.

In the original usage, several scholars (e.g., Cowan, 2006; Neumann, 2013; O'Neill & McMahon, 2005) agreed with considering the student-centered approach as "whole person learning," which Rogers and Freiberg's book *Freedom to learn* proposes (1970). They view learning as meaningful, immersive, and process-oriented rather than product-oriented, emphasizing the active and reflective nature of learning and learners (McCombs, 2012). Moreover, Kember (1997) suggested that the student-centered approach should focus on students' intellectual growth. In his arguments, students are portrayed as active participants as opposed to passive recipients. However, one of the most common understandings at the outset and to this day is to divide the student-centered approach into student-centered learning and student-centered instruction (Lathika, 2016).

On the one hand, student-centered learning refers to a pedagogical concept wherein shifts the focus of instruction from the teacher to the students, with the aim to develop learner autonomy, independence, skills, and practices by putting responsibility for the learning path in the hands of students by imparting skills, the basis on how to learn a specific subject, and schemata required to meet performance requirements (Hannafin & Hannafin, 2010; Jones, 2007; Kassem, 2019; Pedersen & Liu, 2003). Student-centered learning centers on student responsibility and activity, as opposed to conventional instruction that strongly emphasizes teacher control and coverage of academic content (Cannon & Newble, 2013, p. 16–17). This approach allows for greater student autonomy and control over topics, learning methods, and pace of learning (Gibbs, 1992, p. 23). According to McCombs and Miller (2007, p. 25), learning is further strengthened when students have supportive relationships, a sense of ownership and control over the learning process, and the opportunity to learn with and from one another in a climate that is safe and trustworthy. Even though the definition of student-centered learning is continually evolving, academics assert that, regardless of subject matter or discipline, student-centered learning is characterized by some fundamental principles. As well-summarized in the *ECTS Users' Guide 2015* (European Commission, 2017, p. 15):

Student-centered Learning is a process of qualitative transformation for students and other learners in a learning environment. The concept can be summarized into the following elements: (a) Reliance on active rather than passive learning; (b) Emphasis on critical and analytical learning and understanding; (c) Increased responsibility and accountability on the part of the student; (d) Increased autonomy of the student; and (e) A reflective approach to the learning and teaching process on the part of both the student and the teacher.

In nature, the 14 principles of learners and the learning process proposed by the American Psychological Association embody the essence of student-centered learning (McCombs & Whisler, 1997). These principles are classified into four categories: (a) meta-cognitive and cognitive factors, (b) affective and motivational factors, (c) developmental and social factors, and (d) individual difference factors, comprising a framework for designing student-centered practices at all levels of education. Previous studies have repeatedly demonstrated that intelligence and prior knowledge are major predictors of current learning and academic achievement (Ackerman, 2006; Hattie, 2009; Schneider & Preckel, 2017). In this regard, students should not be viewed as blank slates. Instead, they enter the classroom with a wealth of accumulated experience, such as prior knowledge, interests, abilities, attitudes, expectations, and so on, which ought to be taken into account in the design and implementation of student-centered learning. Therefore, student-centered learning is also seen as effective classroom practice which positions students as cognitively active

participants, and provides access of getting students to understand and construct knowledge, as well as develop their skills and attitudes.

On the other hand, simply put, student-centered instruction is when planning, teaching, and assessment revolve around the student's needs and abilities (Brown, 2008). The instructor shares classroom authority, and students are free to explore, experiment, and discover on their own (Doyle, 2012). This does not imply that students are in charge of the classroom, but rather that they have some input into decisions regarding their learning. Students are given options and participate actively in classroom decision-making processes (Kladder, 2019). Thereby, academics such as Weimer (2013) and Blumberg (2019) advocated for a rethinking of the role of the teacher, proposing that in order for instruction to become more student-centered, five key areas need to be transformed:

a. *Balance of power*: challenge the traditional power structure and the role of authority in the classroom;

b. *Function of content*: focus on higher-order thinking rather than memorization, allowing learners to actively explore and reflect on their learning;

c. *Role of the instructor*: serve as a facilitator that promotes learning rather than a content expert or authoritarian classroom manager;

d. *Responsibility of learning*: promote independent, active and autonomous learning, as learners become more responsible for their own learning;

e. *Evaluation purposes and processes*: utilize assessments as tools to promote learning and not tools to generate grades. Incorporate authentic assessments with meaningful, ongoing feedback.

To facilitate this type of student-centered instruction in practice, classrooms frequently set up desks arranged in circles or small groups with "self-guided" or "self-paced" learning rather than a row of desks confronting the teacher (Sawant & Rizvi, 2015). As Collins and O' Brien (2011, p. 446) believed, student-centered instruction symbolizes a creative instructional approach. Students are empowered to involve actively in the learning process. They become the center of the learning process by influencing the content, activities, materials, and pace of learning. By having a say in the course material, learning activities, resources and learning pace, they become the center of the educational process. Appropriately implemented student-centered instruction can enhance knowledge retention and promote motivated learning (Felder & Brent, 1996; Serin, 2018).

According to the existing studies, the ability of students to take part in the inquiry, discourse, and reasoning, the level of student understanding, as well as how to encourage more effective engagement in practices, are all factors that instructors need to be concerned about (Hoidn, 2019; Timperley et al., 2008; Webb, 2009; Wright, 2011). In this sense, the instructor is responsible for taking on facilitating active learning for students, extending beyond merely transmitting knowledge. Moreover, the instructors take into account the relevance and structure of the disciplinary knowledge base when selecting and designing complicated course content. Observational research has also revealed that effective teaching strategies keep eyes not only on the student's cognitive development but also on their motivational and affective states (Hoidn & Reusser, 2020). In addition, the scenarios for the application of student-centered instruction have been proposed, which can be used in both small class sizes and, most potentially, in larger scale classes, encouraging students to remain engaged in the course content and tasks (e.g., Biggs, 2011; Grissom et al., 2017; McCarty & Deslauriers, 2020; Wood & Tanner, 2012). In summary,

student-centered instruction refers to an innovative instructional approach from the perspective of teaching, which provides opportunities for students to co-construct knowledge and to be given more choices to students about what, when, where, how, and with whom they learn, and contributes to the curriculum design, student engagement, student motivation, among others.

From a different angle of constructivist epistemology, constructivist ideas and concepts contributed to the development of the student-centered approach to learning. Constructivism is based on the notion that rather than passively receiving and processing information, students must actively construct and reconstruct knowledge and skills through interactions with their setting as well as other occurrences and previous experiences (Jonassen 1991; Richardson, 2003; Von Glasersfeld, 2012). Indeed, this is what constructionist theories assert:

We perceive learning as reconstruction instead of transmission of knowledge ... extend the concept of manipulatives to the idea that learning is most effective when the learner is engaged in an activity that involves the construction of a significant product (Papert, 1986).

In the student-centered approach, learning is viewed as a complex process that cannot be broken down into logical components. Piaget's (1954) cognitive approaches to education emphasized the interaction between person and environment. The teacher must create an open, problem-solving environment in which the student chooses a task and is available to determine how to accomplish it (Saettler 1990. p. 329). In this regard, Glasgow (1997, p. 34) defined the student-centered approach as one in which students decide what they need to learn to succeed in the class and educational format. Despite the teacher still playing a significant role in facilitating investigative and discovery activities, students are predicted to take on their learning gradually.

Subsequently, Vygotsky (1978) argued, from a social constructivist standpoint, that learning was a social process where students explored concepts that were interesting to them and discussed the meaning of those terms with others. According to Brush and Saye (2000), the student-centered approach is intended to motivate students to play a more active role by taking on the responsibility to organize, analyze, and synthesize information rather than just receiving and repeating it from the teacher. In this process, students are given the authority to optimize their learning processes with support and assessment from teachers and peers (Keiler et al., 2020; Topping, 2009).

Regarding the situated constructivist perspective, the student-centered approach implies that students participate in more challenging, problem-based learning experiences rooted in real-world or professional contexts, assisting them in acquiring the desired and applicable knowledge and skills (Brown et al., 1989; Savery, 2015). As evidenced by the preceding points, these constructivist perspectives have gradually reified as the student-centered approach. Therefore, the emergence of constructivism brought with it the idea that a more open learning environment, more flexible learning paths, and outcome-based learning assessments should be available to students in the student-centered approach.

However, the ideas of empowerment, emancipation, and emotion are also features of the student-centered approach, which are not typically discussed by constructivists but by humanists. From the humanist viewpoint, the student-centered approach is a personalized, meaningful learning process that focuses on the whole person (Hoidn & Reusser, 2020). Teachers seek to cultivate human potential by forming a positive, trusting relationship that stimulates self-confidence and active participation (UNESCO, 2020). The following student-centered approach ideas emerged from the humanist literature (Maslow, 1968; Rogers & Freiberg, 1994; Sharp, 2012; Tangney, 2014; Tulasi & Rao, 2021):

a. Students are encouraged to take control and assume responsibility for their own learning;

b. Fostering engagement to inspire students to become self-motivated to learn;

c. Cognitive and affective learning are components of student-centered learning. In the learning process, knowledge and emotions go hand-in-hand;

d. The provision of a safe learning environment to make students feel physically, mentally, and emotionally secure, and to meet their needs as much as possible;

e. The learning process and the development of dialogue and metacognition are prioritized over the product.

f. Students' self-assessment of their own learning is more significant than teacher evaluation.

Overall, the humanist perspective advocates a human-centered learning environment that provides students with emotional safety and needs, thereby promoting students' potential development. The student-centered approach is, therefore, a practical application of the humanistic theory of learning. Naturing students' abilities to learn by thinking, feeling, acting, and enhancing the sense of freedom and self-directness (Dong et al., 2021; Heim, 2012; Ryback & Sanders, 1980), are more aligned with humanist conceptions of learning.

Based on the paradigm standpoint, the student-centered approach is primarily understood as the outcome of the paradigm shift (Landis et al., 1998; Šušnjar & Hovhannisyan, 2020; Wulf, 2019). The paradigm is conceived to convey that the student-centered approach encompasses all aspects contributing to the organization of teaching and learning in higher education (Gover et al., 2019). The most apparent change in the paradigm shift can be seen as to shift from the focus of pedagogical instruction toward student-centered learning (Alam, 2016; Ali, 2019). In addition, greater emphasis on skills development, especially transferable "life" skills in general, and the design of course units and modules based on intended learning outcomes (Rust, 2002). It is a paradigm shift in educational philosophy and practice, notably in curriculum design, which ties the knowledge and skills in a course with the real world (Klemenčič, 2019; Tam, 2014).

Moreover, the paradigm evolves from focusing on teaching and learning to the institution's entire system, such as institutional culture, mission and goals, resource allocation, administration, and others (Zhao, 2016). In this sense, as Figure 2 shown, the student-centered approach is considered from a holistic paradigm perspective, and "both a mindset and a culture" (ESU & EI, 2010). Barr and Tagg (1995) pointed out that the primary reasons for the failures of the student-centered reforms in the United States since the 1980s were the change-makers' ignorance of the paradigm shift. It implies that the student-centered paradigm shift will not be successful if the student-centered approach is exclusively considered as a matter of teaching and learning, unrelated to other aspects of the institution.

Other researchers, based on examining extensive literature, argue that the concept student-centered approach can be defined according to three distinct categories. One kind is starting from the characteristic perspective. For example, Chung and Walsh (2000) distill their historical finding into three primary meanings: the student is placed at the center of his or her world, the center of education, and students should manage their activities. Some academics focused on students' active role and engagement, who put forward that the student-centered approach is an umbrella term that describes efforts to engage students actively in their learning and design and facilitate the learning process by teachers (Lee & Hannafin, 2016).

Moreover, one is defining student-centered from the context view. Most scholars put the concept into the setting of the classroom. Often, the student-centered approach is interpreted in

terms of classroom practices that include students experiencing, cooperating, assessing, constructing, and directing their learning (Dolezal et al., 2018; O'Neill & McMahon, 2005). According to Hickman (2007), a student-centered classroom is based on desired expectations, is well-designed and organized by the teacher, and is implemented by both students and teachers.

Another is defining the term based on the purposes. For instance, Chinese scholar Zhao (2016), through his analysis of student-centered undergraduate education reform in the United States, pointed out that the student-centered approach has three core meanings: student development, student learning, and learning outcomes. As Sursock et al. (2011) stated, the student-centered approach refers to pedagogy that focuses on the learner and what they learn rather than the teacher and what they teach. It means that the student-centered approach places a much greater emphasis on the learning requirements, interests, desired learning outcomes, abilities, and others (Jaiswal & Al-Hattami, 2020; Jony, 2016).

Recently, a number of reports and documents have raised concerns about students' competence, such as *Trend 2018* report (Gaebel et al., 2018) and *Bologna with student eyes* (European Students' Union [ESU], 2020). The European Credit Transfer and Accumulation System (ECTS) *Users' Guide* defines student-centered learning as a process of qualitative transformation for students and other learners in a learning environment that aims to improve their autonomy and critical thinking via an outcome-based approach (European Union, 2015). As a result, having just a set of competencies as a final outcome of today's university education is no longer sufficient. Higher education must develop transdisciplinary skills in its graduates, such as critical, independent thought and the ability to construct one's knowledge, to foster a well-rounded, cultural personality. These skills are closely related to the student-centered approach (Mielkov et al., 2021). Especially in the Covid-19 pandemic, students' self-discipline and sense of responsibility were particularly tested because of the form of teaching and learning. The student-centered method effectively complements the traditional approach, fostering contact between teachers and students and student development.
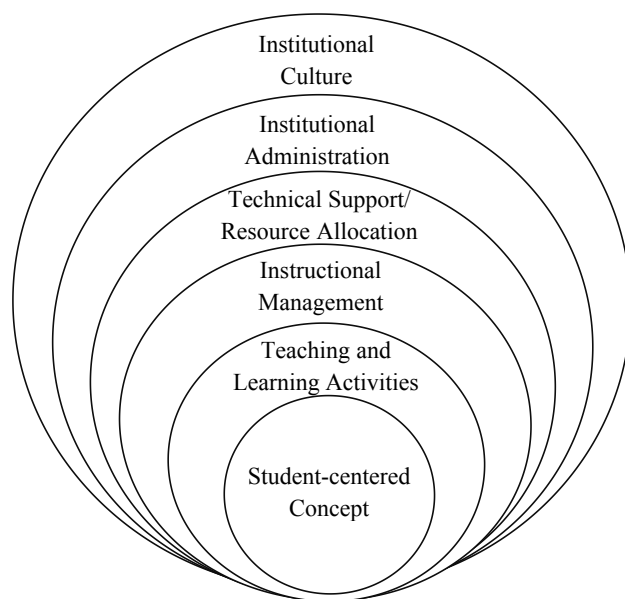
Figure 2. Student-centered approach as a paradigm (Zhao, 2016)

In conclusion, the preceding section sheds light on the historical roots and theoretical perspectives of the student-centered approach, outlining eight categories that propose more or less distinct versions of the concept, including student-centered learning, student-centered instruction, from the constructivist, humanist, paradigm, characteristic, context, and purpose perspectives. These diverse perspectives have resulted in philosophies and practices emphasizing the central role of students in learning, and they continue to challenge our thinking of how learning occurs and deepens in higher education.

In our research, we posit that the student-centered approach should be understood as a meta-concept, a concept at a higher level of abstraction (Klemenčič, 2017). In this sense, the student-centered approach can be parsed into different meanings, linked to various domains, such as pedagogy, curriculum design, activities, assessment, and student engagement. It could represent different stakeholders, and connect various fields. Due to societal and economic development, higher education institutions must continue to participate in curricular and pedagogical renewal to enhance their level of "student-centeredness." Therefore, the definition of the term is still evolving. In the latter empirical study, we will explore the concept of the student-centered approach in today's course through the words of students and teachers.

2.3 The different methods to achieve the different conceptions of student-centered approach
Teachers and students have been exposed to teacher-centered and student-centered approaches through public discourse and authentic classroom experiences. Especially in western countries, for example, the United States, Canada, and the European Union have spent considerable resources devoted to promoting the student-centered approach at all levels of education in the past decades (De la Sablonnière et al., 2009; Leow et al., 2021). They championed that educators can attempt several approaches to make teaching and learning more student-centered. Thus, under the umbrella of the student-centered approach, a variety of distinct methods or concrete learning formats have been gradually developed, including problem-based learning (Barrow, 1980), project-based learning (Blumenfeld et al., 1991), cooperative learning (Vygotsky, 1978), case-based learning (Christensen, 1987), flipped classroom approach (Bergmann & Sams, 2014), inquiry-based learning (Kuhn et al., 2000), challenge-based learning (Birol et al., 2002), and so on.

These terms have frequently described the student-centered approach. These specific methods are closely related to the student-centered approach, emphasizing the students' centrality regarding practice, curriculum, and content (Lee & Hannafin, 2016). Given the diversity of the methods, different methods also implicitly varied understandings of what constitutes the student-centered approach. Therefore, in this section, we will examine these methods are derived and evolved from which kind of student-centered approach concept.

The following listed specific methods are selected for two primary reasons. On the one hand, according to the citespace's findings of the literature concerning the student-centered approach to developing students' competence, these methods are frequently examined and discussed (as shown in Figure 11). On the other hand, the methods used in the course cases are contained in the below-selected ones (as presented in Table 59). A deeper theoretical understanding of these methods is believed to contribute to the foundation for subsequent empirical research analysis.

In *problem-based learning*, students identify what and how to learn in order to solve a complicated practical challenge posed by the teacher through group collaboration (Hmelo-Silver,

2004). In this process, students learn in a self-directed manner, construct and structure a reasonable solution, and reflect on what they have learned and the effectiveness of their solution (Brassler & Dettmers, 2017). They sometimes spend considerable time working on computers, researching, and evaluating peers. The teacher's role is to stimulate learning by supporting, guiding, and monitoring the learning process (Schmidt et al., 2011). The teacher is devoted to helping students build a sense of self-confidence while broadening and deepening their comprehension. This process is grounded in constructivism. Problem-based learning is also a paradigm change from lecture-based conventional teaching and learning philosophy (Hung, 2011) to the paradigm of student-centered learning.

Moreover, problem-based learning promotes students to develop future- and practical life-applicable knowledge and skills, which is one of the core tenets of the student-centered approach, as mentioned in numerous philosophies of the concept student-centered approach. According to several related studies, problem-based learning can enhance students' competence, such as working interdisciplinary, grasping field-specific knowledge and methods, interpersonal and problem-solving abilities, and reflective skills (Thomassen & Stentoft, 2020; Vaaststra & De Vries, 2007), without compromising the level and retention of knowledge (Schmidt et al., 2006). In terms of students' professional competencies, this method has the potential to increase the likelihood of success in the workplace (Rajabzadeh et al., 2022) by fostering "out-of-the-box" thinking (Heaviside et al., 2018).

Project-based learning is a widely used and well-known student-centered pedagogy, like problem-based learning. Typically, in project-based learning, students engage in a challenging, complex project comparable to those they may encounter in real life (Brush & Saye, 2000; Gubacs, 2004). In contrast to paper-based, rote memory, or teacher-centered approach, project-based learning delivers established facts or depicts a clear path to knowledge by instead putting forward questions, problems, or scenarios (Vogler et al., 2018). In the project-based learning setting, the teaching and learning are grounded in real-world scenarios, in which students will be beyond the simple "drill and practice" but into collaborative inquiry and complex thinking around the academic context (Moeller & Reitzes, 2011; Žerovnik & Nančovska Šerbec, 2021), thereby constructing, interpreting, and deepening their meaning and understanding.

Fundamentally, therefore, project-based learning highlights the active, situated, and social features of learning with the simulation of the authentic world in the classroom, resulting in improved student learning outcomes, skills, and attitudes toward learning (e.g., Abdulaal et al., 2011; Guo et al., 2020; Vega, 2012). Moreover, it is a style of active learning and inquiry-based learning (Cattaneo, 2017; Frank et al., 2003). Overall, the philosophical background of using problems or projects in the classroom is rooted in constructivist theory (Piaget, 1969; Vygotsky, 1962) that since students construct their knowledge based on what they have already experienced in the real world while interacting and socializing with others.

The specific student-centered method utilized differs between disciplines. In science education, *inquiry-based learning* is recognized as the most salient pedagogical method and one of the remarkable constructivist movements that require students' personal experience to improve scientific knowledge (Kang & Keinonen, 2018). In inquiry-based learning, students' interest and achievement are enhanced by following scientists' original works to study the natural world and reason based on evidence (Berie et al., 2022; Shih et al., 2010). Moreover, inquiry-based learning emphasizes guided and open inquiry than teacher-directed structured inquiry (Sadeh & Zion,

2009). Hence, it affords students the opportunity to learn how scientific knowledge has been constructed and evolved (Srisawasdi & Panjaburee, 2019). As opposed to the conventional approach in which the teacher imparts knowledge to the students, inquiry-based learning is known as the student-centered orientation (Buchanan et al., 2016). Much research on inquiry-based learning suggested that the vast majority of inquiry-based interventions positively affect students' interest, motivation, achievement, and attitude (e.g., Cairns & Areepattamannil, 2019; Potvin & Hasni, 2014; Tsivitanidou et al., 2021).

Challenge-based learning is a student-centered, experimental learning strategy through which students align the development of disciplinary knowledge with transversal competencies while working on authentic and societal problems (Nichols et al., 2016), aiming to prepare students to address unanticipated and complicated global concerns in the twenty-first century. This method is gaining momentum in higher education institutions worldwide. Regarding the concept, active learning is identified as the overarching approach of challenge-based learning (Gallagher & Savage, 2020; Suwono, Saefi, and Susilo, 2019). There are also references to experiential learning (Colombari et al., 2021), collaborative learning (Johnson et al., 2009), and inquiry-based learning (Gaskins et al., 2015; Leijon et al., 2021). For some academics, it is a blend of active learning and experiential learning (Gibson, Irving, and Scott, 2019). For others, they draw on Vygotsky's sociocultural constructivist theory resulting from the concern about social interaction and knowledge artifacts (Scroccaro & Rossi, 2022).

Unlike other student-centered methods, challenge-based learning identifies the challenge from the big concept to build their learning context instead of framing it by given cases. It fosters an active and real learning environment that necessitates students' creative participation, teamwork, and engagement in their communities. When identifying a challenge, the team must discuss and explore potential solutions with community members (Gallagher & Savage, 2020). In this process, students' collaborative skills will be reinforced (Tang & Chow, 2020). The project completion needs a high level of self-direction in the students since the procedure allows them to think outside their comfort zone and design a project fully under their control (Membrillo-Hernández et al., 2021). Thus, the process promotes deep learning by allowing students ample room to construct and implement their ideas. Besides, the claim that challenge-based learning is successful at enhancing and bolstering metacognitive skills, as well as essential soft skills like creativity, critical thinking, communication, collaboration, and problem-solving, is supported by the past decade of studies (Tajuddin & Jailani, 2013; Gulce-Iz & De Boe, 2020).

The *flipped classroom* is the student-centered method consisting of two components: interactive learning activities during classes and individual learning in direct computer-based outside lessons (Elazab & Alazab, 2015). According to Bergmann et al. (2011), it is a system that affords more interaction time and active learning activities, the demonstration of a situation in which students take responsibility for their learning, the transformation of the teacher's role into that of a facilitator, and the integration of constructivist learning with the teaching and learning method. Since constructivism focuses mainly on the cognitive sides of learning, constructionism attention to the learning that takes place when learners are involved in "doing" and "constructing," acts that are much appropriate for the flipped classroom, promoting students to construct knowledge actively (Green et al., 2017).

Under the guidance of constructivist-inspired thought, the teacher can relocate lower

cognitive level content (e.g., memorization, comprehension) to pre-class tasks, and maximize in-class time with active learning through teamwork activities and individualized teaching in the flipped classroom (Jonassen & Rohrer-Murphy, 1999; Wang et al., 2019). Students concur that flipped classrooms can boost communication, cooperation, and self-learning skills (Munir et al., 2018; Tan et al., 2017). Moreover, This method can also be utilized with other learning methods, such as case-based learning (Herreid & Schiller, 2013), team-based learning (Kang & Kim, 2021), blended learning (Purba, 2021), and others. Related research confirms that the flipped classroom positively benefits student engagement, knowledge, and higher-order thinking skills (Huang et al., 2022; Murillo-Zamorano et al., 2019).

Team-based learning, which is often interchangeable with group discussions, and collaborative learning, is one of the common student-centered methods of combining self-learning prior to the course with the small discussion within the course (Vasan et al., 2009). Throughout the course, students will be separated into several small groups to engage in discussions, debates, and problem-solving activities related to the course subject and content. Academics (e.g., Al Kawas & Hamdy, 2017; Gomez et al., 2010) suggest that this method can be interpreted within the perspective of cognitive science, congruent with social constructivism and Vygotsky's (1932) views, as students are required to construct their understanding within the group environment. The team-based learning seeks to increase students' interaction and engagement, foster a culture of collaboration, and develop students' high levels of autonomy and active learning, ultimately aiding students' learning of the discipline (Atwa et al., 2019; Rezende et al., 2020).

Overall, different student-centered methods are derived and evolved from different concepts. In addition to the methods aforementioned, there are numerous others, such as *experiential learning* (Kolb et al., 2005), *differentiated instruction* (Tomlinson, 1999), and *blended instruction* (Naim, 2018), among others. Although they differ in concept, purpose, application context, and implementation, they share some common characterization in teaching and learning processes.

First, all the methods described have a common aspect – active learning, whose role is to activate students' responsibility and guide students in taking ownership of their own learning while emphasizing the teacher's position as a facilitator (Christersson et al., 2019, p. 3). It is also a crucial driver in moving the relationship between the teacher and students toward equality (Loukkola & Peterbauer, 2019, p. 5). Second, the student-centered approach is constructivist in nature, with a central focus on students' active construction of learning. Third, the role of the teacher is to construct an environment that provides opportunities to meet student's individual needs and integrate social processes into learning so that they can collaborate with one another. Fourth, all the student-centered methods emphasize and strive for developing students' knowledge, and skills, including problem-solving, critical thinking, creativity, and being active through a wide variety of activities or formats, thereby preparing students to get on with future changing environments and collaborate with others. Fifth, this involves a transfer of authority from the teacher to the students. If we take these commonalities into account, we can see that certain methods around student-centered are interconnected, and complementary, and can be used jointly or interchangeably in student-centered classrooms, devoted to increasing students' engagement, meeting the desired learning outcomes, and developing students' competence.

In recent years, the focus on the student-centered approach has increased dramatically in higher education settings across disciplines. However, a better way to expand knowledge and use student-centered approaches in practice remains elusive (Chang et al., 2020). Each discipline has

its own inherited and developed teaching and learning methods based on a specific theoretical foundation. For example, to train future engineers, engineering education has adopted the project-based learning method (Berselli et al., 2020; Mills et al., 2003). The field of computing has applied collaborative learning to afford real learning experiences (Salleh et al., 2011). Moreover, apprenticeship-based medical education utilizes problem-based learning to build the knowledge and skills required of medical professionals to assess and diagnose patients (Neville, 2009). Yet, we have to pose the issue, what type of student-centered approach is appropriate for classrooms in the field of Pedagogy? It appears that student-centered methodologies utilized in the humanities, particularly Pedagogy, have remained a riddle worthy of investigation. Therefore, this study will conduct research to provide more substantial and persuasive evidence in the pedagogy discipline, contributing to broadening understanding and applying the student-centered approach.

2.4 Policies analysis of student-centered approach and competence development: contexts in Italy

2.4.1 The EHEA document: Policies development in Bologna Process

In EHEA, the most prevalent term for student-centered is student-centered learning. The concept has been a topic of discussion in academic literature for a long time but has increasingly captivated the attention of higher education policymakers during the past two decades. Student-centered learning, which has mainly been put forward through the Bologna Process (BP) policy documents since 2007, walked toward the central stage following the Yerevan Ministerial Summit in 2015. At the institutional level, learning and teaching have acquired prominence in universities' agendas, even the most research-intensive institutions. As the importance of student-centered learning has grown, its focus has evolved around key features, such as the learning outcomes approach, curriculum reforms, and a stronger emphasis on the learning and teaching processes themselves. Moreover, student-centered learning has always been considered as a tool to enable higher education to tackle social challenges, such as helping students acquire the competencies necessary for their future professional and civic life. Thus, student-centered learning has been widely accepted among stakeholders such as teachers, students, and representatives of universities and colleges.

Unsurprisingly, the EHEA has been at the forefront of promoting student-centered learning. However, prior to student-centered learning, the emphasis on competence appears to have emerged. At the juncture of the twentieth and twenty-first centuries, European higher education policy took on a dual-track structure. The Bologna Process was initiated and ran concurrently with the development of European law. Both tracks displayed a preoccupation with competences, in connection to citizenship and labor market demands (Davies, 2017). The BP has been to place the concept of competence at the center of university student teaching and learning, and higher education in general (Molina & Sales, 2008). Over the past ten years, several professions have embarked on competence-based curricula, such as medicine, architecture, and engineering, orchestrated by the BP. As with student-centered learning, there has never been a common definition of the concept of competence (e.g., Bergsmann et al., 2015; Tait & Godfrey, 1999). We will explore this topic in the following chapter.

In this section, we will introduce the policy work on student-centered learning and students' competence in the EHEA, based on a review of policy documents and studies undertaken by stakeholders in higher education. The ministerial communiqué, agreed upon by the Bologna

Ministerial Conferences released biennially, outlines the commitments and priorities of the BP. Some major members of EHEA have performed accordingly. Thus, regarding the inclusion of student-centered learning and competence into BP's policy, a review of these communiqués can be particularly instructive. Since 1999, Italy has been one of the initiators and a full member of the BP; hence, Italy must pursue and implement the BP's objectives, including the student-centered approach, in its own higher education system. Given that the policies of the Italian higher education system are within the context of BP, we analyze the documents of EHEA and its consultative members, including EUA and ESU, primarily.

First, we scrutiny the documents about student-centered approach. In the early Bergen Communiqué (2005), although it emphasized that structural changes impacted the curriculum and that adopting new teaching and learning processes should be ensured, it did not address a shift in learning system design toward student-centered learning. The term student-centered *education* was first introduced in the London Communiqué in 2007. It demonstrated unequivocally that:

There is an increasing awareness that a significant outcome of the process will be a move towards student-centered higher education and away from teacher-driven provision. We will continue to support this important development (London Communiqué, 2007, p. 2).

Since then, student-centered has been regarded as an 'underlying principle' of the EHEA (Klemenčič, 2017; Leuven Communique, 2009, p. 2; London Communique, 2007, p. 7). Aside from pedagogy, the London Communique makes explicit connections among student-centered, outcomes-based learning and the national qualifications framework, learning outcomes and credit, lifelong learning, prior learning, and the recognition of prior learning (London Communique, 2007, p. 7). In this sense, there is a strong implicit presumption that BP instruments, including the learning outcomes approach, qualifications frameworks, and ECTS, would result in a greater focus on student-centeredness. Moreover, EUA's Trends V report, which made a significant contribution to this conference held and communiqué, stressed the employment of a learning outcomes-based approach in teaching, hence establishing the groundwork for a student-centered approach in higher education teaching and learning (Birtwistle et al., 2016; Dakovic & Zhang, 2020). Thus, since 2007, the definitions and approaches to student-centered have vastly developed and have continued to include learning outcomes as one of its vital elements.

However, using learning outcomes as the fundamental building blocks for higher education reform predates 2007. For instance, learning outcomes had previously been applied to describe qualifications (Berlin Communiqué, 2003) and as "the cornerstone for the three EHEA cycles of general 'Dublin descriptors'" (Adam, 2008, p. 4; Bergen Communiqué, 2005). At the 2007 London conference, their use was emphasized further and expanded, comprising multiple applications: to define ECTS credits, to assist curricular reform and innovation, to describe modules and study programs, and to promote student-centered outcomes-based learning (London Communiqué, 2007). The simple learning outcome has transitioned from a peripheral instrument to a central one for achieving radical educational transformation in European higher education. The following ministerial communiqués reiterated the connection between student-centered learning, learning outcomes, and curricular reforms.

The Leuven Communiqué (2009) was the first to use the term as it is often used today: student-centered learning rather than student-centered education. This communiqué reaffirmed the significance of the teaching mission of higher education institutions and made student-centered learning an explicit policy objective with a broader meaning. It declared that:

The student-centered learning asks for individual learner empowerment, new pedagogical approaches, effective support and guiding structures, and a curriculum more explicitly oriented on the learner in all three cycles (Leuven Communique, 2009, p. 4).

The curricular change will therefore be a constant process. Since 2009, a new element was evident: student-centered learning should provide solutions for flexible, individualized learning pathways (Declaration, 2010; Leuven Communiqué, 2009; Yerevan Communiqué, 2015). Concurrently, student-centered learning also appears in the template of the national implementation report. Six categories of student-centered learning are listed: independent learning, group learning, teaching training for staff, assessment based on learning outcomes, recognition of prior learning, learning outcomes, student/staff ratio and student evaluation of teaching (Klemenčič, 2017).

Moreover, the position of student-centered learning as the policy objective is established through a normative relationship between student-centered learning and students. The communiqué stated that "student-centered learning and mobility will assist students in acquiring the required competencies for a changing labor market and will enable them to become active, responsible citizens (Leuven Communique, 2009, p. 1)." It indicates that a link between student-centered learning and students' competence development has been drawn.

After this communiqué, another positive trend was that reporting on student-centered learning policies was formally incorporated into the BP national implementation reports. In the subsequent Bucharest Communiqué (2012) and Yerevan Communiqué (2015), the commitment to SCL was reinforced with more focus on innovative approaches, active student engagement in their learning, and the requirement to support higher education institutions and faculty. The Communiqués stated that:

We reiterate our commitment to promote student-centered learning in higher education, characterized by innovative methods of teaching that involve students as active participants in their own learning. Together with institutions, students and staff, we will facilitate a supportive and inspiring working and learning environment (Bucharest Communiqué, 2012, p. 2).

Enhancing the quality and relevance of learning and teaching is the main mission of the EHEA. We will encourage and support higher education institutions and staff in promoting pedagogical innovation in student-centered learning environments and in fully exploiting the potential benefits of digital technologies for learning and teaching (Yerevan Communiqué, 2015, p. 2).

Besides, student-centered learning is described as a fundamentally pedagogical concept in the 2012 Budapest Communiqué. Its traits are essential for fostering students' intellectual self-formation as well as mastery of disciplinary knowledge and skills. According to the Bucharest Communique (2012), students develop intellectual independence, personal self-assuredness, and critical thinking alongside disciplinary knowledge and skills during the process of teaching and learning in higher education. We ought to ensure that, at the final result of each study cycle, graduates are equipped with the competences necessary for accessing the labor market, as well as the ability to acquire new skills that may be necessary for their careers later in their careers (Yerevan Communiqué, 2015).

Arguably, for the practical implementation of student-centered learning, its incorporation into the ESG was perhaps a more significant consequence of the BP. The student-centered learning policy goal began to be far-reaching and universally implemented in 2015, following the revision

of the ESG. The newly adopted ESG introduced an entirely new standard for student-centered learning, teaching, and assessment (ESG, 2015, p. 12). Several other standards in ESG refer to student-centered learning, as shown in Table 2.

Overall, the document ESG is practically valuable as its standards and guidelines are utilized both for internal quality assurance (QA) to improve the quality of institutions; and for external QA, which implies that these standards and guidelines are applied to evaluate the institutions and the study programs. In this manner, the ESG encourages the development of internal capacity for quality improvement while also providing universities and colleges with external incentives to do so. Furthermore, it is also crucial to highlight the consensus on student-centered learning in ESG – most higher education stakeholders endorse the concept of student-centered learning, given that the initial version of the ESG in 2005 and its revision in 2015 were delegated to stakeholder groups.

Table 2. Standards in the ESG (2015) referring to student-centered learning

Standards in the ESG (2015)	Referring to student-centered learning
Standard 1.1	Students as internal stakeholders are jointly responsible for internal QA, that they and other stakeholders should be be involved in designing and continuous improvement of QA methodologies. QA agencies and accreditation bodies need to ensure involvement of stake holders in their governance and work.
Standard 1.2	Students and other stakeholders should be involved in the design of the study programs.
Standard 1.3	Institutions should ensure that the programs are delivered in a way that encourages students to take an active role in creating the learning process, and that the assessment of students reflects this approach. Student-centered learning and teaching plays an important role in stimulating students' motivation, self-reflection and engagement in the learning process.
Standard 1.5	Emphasizing the need for student-centered teaching and the changing role of teachers in student-centered learning.
Standard 1.6	Student-centered learning and flexible modes of learning and teaching need to be taken into account when allocating, planning and providing the learning resources and student support.

The most recent communiqués, namely Paris Communique (2018) and Rome Communique (2020), continue in the same vein, committing to promote the adoption of student-centered learning. These two communiqués incorporate student-centered learning into the commitment to innovation in learning and teaching, better aligning student-centered learning with the development of students' cultural, professional, and transversal skills and competences, to meet the challenges and seize the opportunities that the new decade will bring. We could see that they referred to student-centered learning in the context of enabling flexible learning paths that can foster students' knowledge, skills, and competences:

For the ongoing development and full implementation of student-centered learning, we will provide diverse learning methods and flexible learning to study programs, encourage institutions

to offer interdisciplinary programs, and combine academic and work-based learning to foster critical and creative thinking. [...] With adequate quality assurance, we will make it possible for our education systems to better use digital and blended education to promote lifelong and flexible learning and digital skills and competencies (Paris Communiqué, 2018, p. 3).

For building an innovative EHEA by 2030, higher education institutions will continue to diversify their learning offer and innovate in contents and delivery methods to meet rising demands for innovative and critical thinking, emotional intelligence, leadership, teamwork, problem-solving skills, as well as enterprising attitudes.[...] Flexible and open learning routes, which were part of the original inspiration for the Bologna Process, are crucial components of student-centered learning and are in high demand in current communities. In addition to completing degree programs, many institutions offer smaller units of learning that allow students to update knowledge, skills, and competences swiftly (Rome Communiqué, 2020, p. 4, 6).

As Klemenčič (2017) concluded, the principal references to student-centered learning in EHEA policy documents illustrate three different yet overlapping concepts of student-centered:

- A innovative pedagogic approach to promoting active learning;

- A cultural framework for developing communities of learning;

- A lever supporting learning systems to foster students' ability to shape their learning environments and pathways.

Regarding the term competence, it was mentioned at the beginning of the Bologna process in 1999. However, the Bologna Declaration of 1999 and the subsequent ten ministerial communiqués do not present a generally agreed or stable definition of competence (as shown in Table 3). In the initial decade, they demonstrate an emphasis on citizenship-related competence. This emphasis never fades totally, but it diminishes as the focus on lifelong labor market relevance develops. In Yerevan communiqués (2015), the meaning of competence is presented in a broader range of references, including citizenship, lifelong employability, and international mobility. At the most recent ministerial conference – in Rome in 2020 – the term competence took on more connotations, such as digital skills and intercultural and linguistic abilities.

Table 3. Incidence of the word 'competence' in ministerial communiqués of Bologna Process

Communiqué	Referring to the term competence
Bologna declaration (1999)	A Europe of Knowledge is now widely recognised as an irreplaceable factor for social and human growth and as an indispensable component to consolidate and enrich the European citizenship, capable of giving its citizens the necessary competences to face the challenges of the new millennium, together with an awareness of shared values and belonging to a common social and cultural space.
Prague (2001)	Not mention.
Berlin (2003)	Ministers encourage the member States [i.e., the Bologna signatory countries] to elaborate a framework of comparable and compatible qualifications for their higher education systems, which should seek to describe qualifications in terms of workload, level, learning outcomes, competences and profile. They also undertake to elaborate an overarching framework of qualifications for the European Higher Education Area.

Bergen (2005)	We adopt the overarching framework for qualifications in the EHEA, comprising three cycles (including, within national contexts, the possibility of intermediate qualifications), generic descriptors for each cycle based on learning outcomes and competences, and credit ranges in the first and second cycles. […] The European Higher Education Area is structured around three cycles, where each level has the function of preparing the student for the labour market, for further competence building and for active citizenship.
London (2007)	Higher education should play a strong role in fostering social cohesion, reducing inequalities and raising the level of knowledge, skills and competences in society.
Leuven (2009)	Student-centred learning and mobility will help students develop the competences they need in a changing labour market and will empower them to become active and responsible citizens. […] Lifelong learning involves obtaining qualifications, extending knowledge and understanding, gaining new skills and competences or enriching personal growth. […] With labour markets increasingly relying on higher skill levels and transversal competences, higher education should equip students with the advanced knowledge, skills and competences they need throughout their professional lives.
Budapest-Vienna declaration (2010)	We acknowledge the key role of the academic community—institutional leaders, teachers, researchers, administrative staff and students—in making the European Higher Education Area a reality, providing the learners with the opportunity to acquire knowledge, skills and competences furthering their careers and lives as democratic citizens as well as their personal development.
Bucharest (2012)	Today's graduates need to combine transversal, multidisciplinary and innovation skills and competences with up-to-date subject-specific knowledge so as to be able to contribute to the wider needs of society and the labour market. […] Lifelong learning is one of the important factors in meeting the needs of a changing labour market, and higher education institutions play a central role in transferring knowledge and strengthening regional development, including by the continuous development of competences and reinforcement of knowledge alliances.
Yerevan (2015)	Thanks to the Bologna reforms, progress has been made in enabling students and graduates to move within the EHEA with recognition of their qualifications and periods of study; study programmes provide graduates with the knowledge, skills and competences either to continue their studies or to enter the European labour market; institutions are becoming increasingly active in an international context; and academics cooperate in joint teaching and research programmes. […] By 2020 we are determined to achieve an EHEA where our common goals are implemented in all member countries to ensure trust in each other's

higher education systems; where automatic recognition of qualifications has become a reality so that students and graduates can move easily throughout it; where higher education is contributing effectively to build inclusive societies, founded on democratic values and human rights; and where educational opportunities provide the competences and skills required for European citizenship, innovation and employment. […]

Study programmes should enable students to develop the competences that can best satisfy personal aspirations and societal needs, through effective learning activities. […]

We need to ensure that, at the end of each study cycle, graduates possess competences suitable for entry into the labour market which also enable them to develop the new competences they may need for their employability later in throughout their working lives. […]

We will promote international mobility for study and placement as a powerful means to expand the range of competences and the work options for students. […]

Paris (2018)	We will enable our education systems to make better use of digital and blended education, with appropriate quality assurance, in order to enhance lifelong and flexible learning, foster digital skills and competences, improve data analysis, educational research and foresight, and remove regulatory obstacles to the provision of open and digital education.
Rome (2020)	Higher education institutions have the potential to drive major change – improving the knowledge, skills and competences of students and society to contribute to sustainability, environmental protection and other crucial objectives. They must prepare learners to become active, critical and responsible citizens and offer lifelong learning opportunities to support them in their societal role.
	Swift up-dating of knowledge, skills and competences will be required to respond to the challenges and develop the opportunities that the new decade will bring.
	We commit to supporting our higher education institutions in using digital technologies for learning, teaching and assessment, as well as for academic communication and research, and to investing in the development of digital skills and competences for all.
	Cooperation and mobility connect our systems and foster the development of intercultural and linguistic competences, broader knowledge and understanding of our world. [...] Notwithstanding the current difficulties related to the COVID-19 pandemic, we reaffirm our target that at least 20% of those graduating in the EHEA should have experienced a study or training period abroad, and further commit to enabling all learners to acquire international and intercultural competences through internationalization of the curricula or participation in innovative international environments in their home institutions, and to experience some form of mobility, whether in physical, digitally enhanced (virtual) or blended formats.

Among these ministerial conferences, Berlin (2003) was historically significant since it formulated a qualifications framework in terms of workload, level, learning outcomes, competencies, and profile, with learning outcomes and competences as distinct categories. Thereby, in 2004, in response to this ministerial communiqué, the Dublin Descriptors were developed, which outline the desired attributes of students who have completed courses at different cycles or levels. It is noteworthy that the term competence was not still systematically employed at that time, but only appears in Bachelor's degrees. Given the continuity between ministerial conferences in the BP process, a sequential reading of all the communiqués results in a sensation of overwhelming repetition. It is clearly discernible that the increasing emphasis on employability since 2005 and digital skills since 2018. Nevertheless, they provide no consistent notion of competence.

Greater expectations may be put in the Bologna Follow-Up Group (BFUG), which administers the Process on an autonomous basis between ministerial conferences. BFUG contains stakeholder groups with the possibility to provide discussions with a stronger bottom-up character and a greater potential to delve into the views of higher education institutions, their faculty, and their students. Unfortunately, it also fails to give a precise definition: "in the context of the Dublin Descriptors and the Tuning project, learning outcomes are viewed in the broadest meaning and include competences, which may have a more specific connotation just inside particular discourses (Bologna Working Group, 2005)."

Overall, From this brief analysis of the substance of the communiqués, it is clear that the concept of student-centered learning, which was initially overlooked in its importance, though, has over time, been recognized as a crucial component of the EHEA. While the connotation of competence has constantly been expanding since the start of the BP. At present, the BP transformations (2020–2030) have ushered in a new vision – building an inclusive, innovative, and interconnected EHEA by 2030. Significantly, it features a growing relevance and innovation of learning and teaching in the vein of new higher education, aligning student-centered learning, teaching, assessment, learning outcomes, competence, and practices. This context reveals that while learning and teaching received a continuous and substantial emphasis in the BP, there is still a need to pay more attention to the student-centered learning process for students' competence development.

2.4.2 Student-centered learning and students' competence in policies of other European stakeholder organizations

However, the concept of student-centered learning and competence are not only contained in the BP and its outcomes. The European Union, the European University Association, and the European Students' Unions, each representing different stakeholders, have also exhibited an interest in these terminologies and have incorporated them in a range of their policy documents. These organizations' experience with both student-centered learning and students' competence development in a policy context and grassroots (e.g., higher education institutions) makes their contributions especially pertinent to the subject matter of this section.

First, at the European Union level, the ECTS, sponsored and created as a pilot project by the European Commission in the early years of the ERASMUS program, tries to explain the nature of competence through several versions of the *Users' Guide* (as summarized in Table 4). The first

edition, published in 2005, remained faithful to the early Tuning position, describing competences as bundles of attributes, abilities, and attitudes, while placing learning outcomes at a higher order of complexity, comprising sets of competences, such as disciplinary competence and generic competence. In 2006, the EU defined the key competence of lifelong learning - competence is a combination of knowledge, skills, and attitudes appropriate to the context (European Union, 2006). However, the term student-centered learning has not emerged at that time in EU documents.

Table 4. Definitions of competence in successive editions of the *ECTS Guide*

ECTS Users' Guide	Referring to the term competence
ECTS Users' Guide (2005)	Learning outcomes are sets of competences, expressing what the student will know, understand or be able to do after completion of a process of learning, long or short. […] Competences represent a dynamic combination of attributes, abilities, and attitudes. […] Competences are formed in various course units and assessed at different stages. They may be divided into subject-area-related competences (specific to a field of study) and generic competences (common to any degree course).
ECTS Users' Guide (2009)	In Europe, a variety of terms relating to "learning outcomes" and "competences" are used with different shades of meaning and in somewhat different frames of reference. In all cases, however, they are related to what the learner will know, understand and be able to do at the end of a learning experience. Competence: A dynamic combination of cognitive and metacognitive skills, knowledge and understanding, interpersonal, intellectual and practical skills, ethical values and attitudes. Fostering competences is the object of all educational programmes. Competences are developed in all course units and assessed at different stages of a programme. Some competences are subject-area related (specific to a field of study), and others are generic (common to any degree course). It is normally the case that competence development proceeds in an integrated and cyclical manner throughout a programme.
ECTS Users' Guide (2015)	Learning outcomes express the level of competence attained by the student and verified by assessment.

The second version of competency was introduced in 2009 based on the definition in the European Qualifications Framework (EQF). Competence, as defined by the EQF, is the proven ability to apply knowledge, skills, and personal, social, and/or methodological abilities in work or study settings, as well as in the context of professional and personal development. Competence is referred to as responsibility and autonomy within the context of the EQF (European Union, 2008). Along this route, the second version of the Users' Guide lays more emphasis on the fact that competence is the objective of all educational programs, should be established in each course unit and assessed at various program stages. The third version (2015) preserves the 2009 Glossary entry, reproducing the EQF definition of competence, but for an attempt to disentangle

competence from learning outcomes by adding a statement – using learning outcomes to express the level of competence.

Moreover, Modernization Agenda is a significant agenda in EU. *Supporting Growth and Jobs – An Agenda for the Modernisation of Europe's Higher Education System* was introduced by the European Commission in 2011 as a new agenda. Although it still did not use the term student-centered learning, student-centered learning is featured in both the EU Council's conclusions and the European Parliament's declaration (2012). For example, it stated that "to enable more effective and personalized learning experiences, teaching, and research methods; encourage a greater variety of study modes, by adapting funding mechanisms where necessary; encourage institutions to build learning mobility more systematically into curricula."

The new agendas emphasize the importance of acquiring competence through the learning approach. In 2017, the European Commission further updated *EU Agenda for Higher Education*, which maintained its earlier Council conclusion by emphasizing "well-designed higher education programs and curricula, centered on students' learning requirements," aiming at effective skills development (European Commission, 2017a). The road map for this effort listed "enhancing student-centered learning and teaching" as one of the commission's objectives (European Commission, 2017b). Students should be able to develop skills and experiences "through activities focused on real-world situations," such as work-based learning, in higher education. Technology may also provide fresh methods to structure the arrangement of teaching and learning, as well as boost the flexibility of learning routes and teacher-student interaction (European Union, 2019). In the following 2018, the European Parliament in its texts adopted of *Modernisation of education in the EU*, recommended that "Member States and educational institutions promote learner-centered, individualized learning methods," "highlighted the role of research-based education and pedagogical research in stimulating a student-centered approach to learning and teaching" and "emphasizing the cooperative and creative approaches to equipping students with knowledge and skills, including transversal and soft skills, professional, transversal, social and civic competences, as well as lifelong learning attitude" (European Parliament, 2018).

In recent years, we should note further that the COVID-19 pandemic has altered the skill requirements of the labor market (European Parliament, 2021). Consequently, the European Parliament (2020) urges that it is time to rethink and update curriculum and learning approaches and accelerate the rate of change. They encourage the Member States to embrace digitalization and innovation and integrate new pedagogical technology in a sensible and learner-centered way. In addition, they stressed that although blended learning is the trend, there is no substitute for direct interaction between teachers and students. Only face-to-face learning can successfully ensure the development of interpersonal and social skills.

Other EU documents that also mention student-centered learning and students' competence, in addition to the higher education agendas, include *Improving the Quality of Teaching and Learning in Europe's Higher Education Institutions* from the High-Level Group on the Modernisation of Higher Education, and the analytical reports from the European Commission (e.g., Klemenčič et al., 2020). All in all, the documents mentioned above serve as examples of student-centered learning as a goal of higher education and its importance in developing students' competence. During the past two decades, there is little doubt that student-centered learning has gained respect, and its recognition in policy documents has gradually grown.

Second, the European University Association (EUA) is the largest and most extensive

organization representing universities, as a consultative member of BFUP, playing a vital role in shaping EHEA policies on higher education. Since 1999, EUA has been publishing Trends reports, which have become landmark publications over time, and are now regarded as reference tools by policymakers and the higher education community alike.

According to the EUA's Trends 2015 report, student-centered learning refers to pedagogy focused on the learner in which the learning process is not simply or mostly about knowledge transfer, but also about a deeper understanding and critical thinking (Sursock, 2015). In this approach, teachers are considered facilitators who share learning responsibility with their students and place emphasis on their learning autonomy, motivating students to construct their meaning through proactive, independent learning, exploration, and reflection (Dakovic & Zhang, 2020; Gaebel et al., 2018). Additionally, the previous Trends 2010 report revealed common features of the student-centered approach (Sursock et al., 2010):

- Learners are seen as individuals – taking account of their particular backgrounds, experiences, perceptual frameworks, learning style, and needs;

- Often an emphasis on interdisciplinarity;

- Involvement of learners in determining what is learned;

- Formative assessment and continuous feedback;

- Blended teaching models;

- Recognition of prior learning, thus benefiting both traditional and non-traditional learners and providing the flexibility to learn throughout life.

Furthermore, EUA highlights the importance of learning and teaching as universities' core goals and duties. In the 2017 paper, student-centered learning is a fundamental and implicitly apparent component of teaching and learning in higher education. Universities are expected to ensure that their learning and teaching activities are geared toward student learning and success (EUA, 2017; EUA, 2018a). In this sense, student learning requirements and success are deemed to be crucial to the educational mission of institutions. Students develop not only professional knowledge but also the abilities necessary for a future career and an ever-changing society. Thus, active learning methods are especially pertinent in this context, as they facilitate the development of learners as engaged and responsible citizens, critical thinkers, and problem solvers who are prepared for lifelong learning (EUA, 2017). Align with the position paper, *European Principles for the Enhancement of Learning and Teaching* demonstrates the EUA's continued focus on student-centered learning. The following are first two particularly relevant principles (EUA, 2017):

- The higher education learning experience nurtures and enables the development of learners as active and responsible citizens, critical thinkers, problem solvers, equipped for life-long learning.

- Learning and teaching is learner-centered.

This document also acknowledges that student-centered learning, quality assurance, and focusing on learning outcomes are key components of current European higher education. Such emphasis on student learning is inextricably linked to learning outcomes' development, assessment, and attainment. The work of EUA in 2018 underscores that clearly stated learning outcomes provide the foundation for effective curriculum implementation via the student-centered approach (EUA, 2018b; Gaebel & Zhang, 2018). In student-centered learning, the learning process and its assessment are identified by intended learning outcomes based on the skills and knowledge

a future graduate will require (EUA, 2018a). *Student-centered Learning: Approaches to Quality Assurance* is the title of a report issued by the EUA in 2019 that describes student-centered learning in relation to course design and internal QA. Institutions should engage internal stakeholders to build a shared understanding of student-centered learning, which can subsequently be utilized to influence QA processes (Gover & Loukkola, 2018, p. 36). This entails laying this responsibility squarely on the shoulders of universities and integrating QA of student-centered learning into current systems instead of addressing it separately. How this is carried out will rely on the architecture of each institution's internal QA system. Abundant evidence shows that although student-centered learning is a topic of significant interest and value to universities across Europe and beyond, there are widespread difficulties in addressing the notion in practice, mostly as a result of its broad scope and the absence of a shared cognition of the term (e.g., Gover et al., 2019; Reichert & Tauch, 2005). Thus, we have attempted to provide more solutions and perspectives to this phenomenon.

Third, through the EHEA, a new viewpoint on stakeholder involvement arose in which the substantial value of student participation was recognized (Klemenčič, 2012). ESU played a crucial role in developing student engagement policies and practices. This assured students' interests are represented inside BP policies and generally bolstered ESU's status and participation in European higher education policy-making (Zgaga, 2019). Since the beginning of the Bologna Process, the ESU has advocated for incorporating SCL in European-level policies and its application in higher education throughout Europe.

Initially, in 1992, as the mission of the European Student Information Bureau (ESIB) shifted from a purely information-sharing organization to a political organization representing the perspectives of students in European institutions, the organization changed its name to the National Union of Students. In May 2007, the current name, ESU, was introduced. As early as 2003, the policy paper of ESIB mentioned student-centered learning and teaching practices as one of the possible advantages of BP (ESIB, 2003). Since the 2006 publication of the ESU policy document towards the goals on student-centered learning setting for 2010, student-centered learning has been elevated to a position of greater prominence, preceding the London Ministerial Communiqué. In this paper, the term student-centered learning was given its own policy document, which articulated ESU's vision for it for 2010. Besides, the learning outcomes were regarded as "the core conceptual foundation of the student-centered education system" (ESIB, 2006). In the following 2008, ESU issued a document titled *Towards 2020–A Student-Centred Bologna Process*, in which it voiced its expectation that QA in EHEA will result in education "placing the individual student at the center of their learning experience" and that instruments, including qualifications frameworks, will ultimately lead to the "development of a system of student-centered learning" (ESU, 2008).

After the formal introduction of student-centered learning in BP, the ESU has advocated increasingly for student-centered learning as a wider definition that should be applied to all aspects of higher education and not just pedagogy in the limited sense (ESU, 2012). The ESU's core understanding of student-centered learning initially appeared in 2013 and was reaffirmed in 2015:

Student-centered learning represents both a mindset and a culture within a given higher education institution and is a learning approach that is broadly related to, and supported by, constructivist theories of learning. It is characterized by innovative methods of teaching which

aim to promote learning in communication with teachers and other learners and which take students seriously as active participants in their own learning, fostering transferable skills such as problem-solving, critical thinking, and reflective thinking (ESU, 2013; ESU, 2015).

Despite culture being rarely discussed in policy debates regarding student-centered learning, it is crucial to the implementation of this approach, especially the institutional culture. It mirrors some deeply ingrained cultural norms, and policies or initiatives that lack cultural awareness are inclined to fail. Thereby, student-centered learning is more likely to be implemented in a democratic university climate (Serin, 2018). In the cultural notion of student-centered learning, we also cannot overlook the cultural orientation and diversity of students, such as Susan and Robert in Biggs's (2011) book. Moreover, in the most recent publication by Klemenčić et al. (2020), a comprehensive description is provided that incorporates all components of student-centered learning and teaching from the viewpoint of ESU. Student-centered learning and teaching are defined as follows:

An overarching approach to designing learning and teaching in higher education, is founded on the concept of student agency. Student-centered learning and teaching primarily concerns the capability of students to participate in, influence and take responsibility for their learning pathways and environments, in order to achieve the expected learning outcomes. [...] Student-centered learning and teaching as an approach [...] moves beyond the classroom practice to construct inclusive and supportive learning and teaching environments within the higher education institution and its subunits, as well as in broader higher education systems at regional, national and supranational levels (Klemenčić et al., 2020, p. 33).

In light of the above definition, we recognize that firmly implementing the student-centered approach in a university or higher education system entails more than just adopting new methods of learning and teaching for students, but also fostering a mindset and climate in which students co-create their own learning experience. For student-centered learning to be successful, it requires being integrated into the institution's overall mission and may necessitate a cultural shift. Student-centered learning, comprising active learning and flexibility, can only be achieved if students take responsibility and initiative to become active learners. The university's mission is to offer the appropriate atmosphere for this to transpire.

Moreover, the student-centered approach is identified as one of the elements of quality education and is assigned its own chapter in a series of ESU's policy papers on higher education quality (ESU, 2017). In these documents, the points of student-centered learning are reaffirmed, and the commitment to Bologna structural components as student-centeredness instruments is once again manifest:

Learning outcomes, credit systems, qualification frameworks, flexible curricula and recognition of prior learning are examples of approaches and instruments that form the conceptual and operational basis of this paradigm shift from teaching to learning and a student-centered education system, and can, if used in the right way, lead to a significantly higher quality of our education (ESU, 2017, p. 4).

Generally speaking, the student-centered policies of ESU contain four intriguing features. First of all, from the definition perspective, the scope of ESU's student-centered approach was quite extensive. In the eyes of ESU, this word encompasses a wide range of higher education ingredients, such as pedagogy, tools, culture, learning setting, and engagement. Next, since the inception of the BP, ESU has placed a great deal of trust in its structural elements, like learning

outcomes, as tools for realizing the student-centered approach. Then, students are expected to achieve expected learning outcomes and foster transferable skills through student-centered learning. Finally, any effort to define SCL occurred relatively late in ESU policies, indicating general difficulties with defining and operationalizing the concept. A more inductive approach was employed, with different instances of student-centered learning listed and illustrated (Šušnjar & Hovhannisyan, 2020).

On top of formulating policies and continually promoting student-centered learning, ESU also carried out two significant projects in this area: Time for Student-Centred Learning (T4SCL) and Peer Assessment of Student-Centred Learning (PASCL). The common aim of both projects is to provide an overview of the theory and practice of the student-centered approach and guidance for its practical implementation. We particularly deserve to be aware of the first project, T4SCL, which was conducted in collaboration with EI, a global association that covers teachers and other education staff organizations. This relationship demonstrated that both organizations representing the most deeply engaged stakeholders in learning and teaching have a firm commitment to the student-centered approach.

In addition, other important higher education stakeholder organizations have accentuated the positions on student-centered learning and issued their initiatives. For instance, the European Trade Union Committee for Education (ETUCE), an association of teachers' unions, contains a statement in its policy document on QA of higher education: Principles of student-centered learning will improve the quality of students' experiences, thereby contributing to the accomplishment of the intended learning outcomes (ETUCE, 2014).

Student-centeredness of a university can also be examined via the lens of QA procedures, as the ESG for QA mandates a student-centered approach in the delivery and assessment of a program (ESG, 2015). ENQA, a designated stakeholder organization of QA agencies in the EHEA, asserts that quality assurance agencies cannot disregard student-centered learning and learning outcomes, which are the prominent parts of the Bologna reform agenda. Learning outcomes are advantageous to QA because they promote transparency and comparability among qualifications standards. Moreover, learning outcomes are valuable in course design, and employers better understand the graduates' acquired knowledge, skills, and competences (ESU, 2010).

According to the European Association of Institutions of Higher Education (EURASHE), the student-centered approach mission of higher education institutions is inextricably linked, both conceptually and practically, to all of the preceding themes, like employability and lifelong learning (EURASHE, 2010). In the globalized learning society, universal competences are in demand, such as interpersonal skills, intercultural skills, multilingualism, international awareness, and, perhaps most importantly, the ability to learn how to learn in different formal and informal settings.

In summary, as is evident throughout this section, the student-centered approach has been present in European-level policy discussions for more than a decade, beginning with the statements in communiqués and progressing to the work of the BFUG and consulting members, which resulted in a set of recommendations of the EHEA governments for the implementation of the student-centered approach. Today, the student-centered approach as a policy objective has been raised to a core position, widely endorsed by various stakeholder organizations, and incorporated in different forward-looking and action-oriented documents. Likewise, numerous stakeholders put great emphasis on students' competence, such as employability, transferable

skills, etc. The adoption of student-centered learning is heavily reliant on the implementation of other Bologna instruments, particularly learning outcomes. Learning outcomes describe the measurable skills, knowledge, or values that students should be able to perform or display after finishing a study program, course, or lesson (Wagenaar, 2014). Thus, various policies and documents generally align the student-centered approach with learning outcomes, to facilitate the development of students' competence.

Implementation of the student-centered approach is occurring. However, it is questionable, to what extent the European-level policy initiatives stimulate actions and trigger change at the national and institutional levels within Europe. As the ESU's *Bologna with Student Eyes* (2020) found, the student-centered approach in universities is implemented exceedingly slowly, and unevenly throughout the EHEA, and the issue of improper implementation poses a severe risk. This viewpoint is also strengthened by some academic research (e.g., Birtwistle et al., 2016; Damiani, 2019). In other words, it is difficult to say, at the institutional level, whether the student-centered approach is adopted and translated from guidelines into practice (Šušnjar & Hovhannisyan, 2020). The question of the actual impact of the student-centered approach on students' competence also remains open. Thus, we attempt to measure whether any progress has been made in implementing the student-centered approach and its impact on students' competence development from the perspective of the most direct stakeholders.

2.4.3 The Tuning Project

Globally, Tuning project (Tunning Educational Structures in Europe) is potent instrument for fostering mutual understanding and cooperation between institutions, nations, and regions. In Europe, the Tuning Process has proceeded in parallel with the BP. Launched in 2000 with substantial financial and moral backing from the European Commission, the Tuning Project comprises the majority of Bologna signatory nations today. Organized by and for universities, they lay stress on following a shared methodology, and developing effective and concrete strategies to undertake the transition to competence-based, learner-centered higher education practices (González & Wagenaar, 2003).

One of the objectives of the Tuning Project is to contribute to the development of university degrees that are easily comparable at the European level. Tuning acts as a platform for constructing subject-level reference points. These are relevant for rendering each cycle's study programs comparable, compatible, and transparent in the BP. If graduates are going to move and find employment in different nations of the European area, their educational path requires a high level of consensus on some recognized reference points. The reference points are stated in terms of learning outcomes and competences. Learning outcomes are described based on the principle of "what would they be expected to know, understand and do after the learning experience." The primary strength of these reference points is that they allow for autonomy and flexibility in constructing curricula, while also serving as a foundation for building indicators everyone universally understands. Competences are a dynamic combination of knowledge, comprehension, abilities, and skills. The purpose of educational programs is to develop competences, which will be cultivated across many course modules and assessed at various stages.

Applying the learning outcomes and competence approach may also necessitate adjustments in the teaching, learning, and assessment methods employed in a program. Competencies can be classified as subject-specific and generic ones, for which Tuning has established methodologies

and best practices to develop. Although the significance of building and developing subject-specific knowledge and skills as a basic element for degree programs is recognized, Tuning has underlined the need to devote time and attention to the development of generic skills or transferable skills, which is becoming increasingly important in preparing students as thoroughly as possible for their future roles in society. Tuning project distinguishes three types of generic competences (González & Wagenaar, 2008):

- Instrumental competences: cognitive abilities, methodological abilities, technological abilities and linguistic abilities;

- Interpersonal competences: individual abilities like social skills (social interaction and co-operation);

- Systemic competences: abilities and skills concerning whole systems (combination of understanding, sensibility and knowledge; prior acquisition of instrumental and interpersonal competences required).

Table 5. Specific competences for the filed of Educational Sciences (Tuning Project, 2017, p. 45–47)

First Cycle

Many competences (generic and specific) are common to Teacher Education and Education Sciences; some competences are specific to Teacher Training. Not all competences will be fully developed upon reaching the first level degree and will continue to develop throughout the professional life, often subject to focus during in-service training periods, but not necessarily developed in formal education contexts.

Key subject specific competences	Key generic competences
Common to Teacher Education and Education Sciences Teachers and trainers should be able to work effectively in three overlapping areas, as should graduates of Education Sciences programmes. They should be able to: - Work with information and knowledge of subject to be taught, and of educational issues and their theoretical bases; - Work with their fellow human beings - pupils/trainees, colleagues and other partners in Education. This includes the ability to analyse complex situations concerning human learning and development in particular contexts; - Work with society – at local, regional, national, European and broader global levels including the development of appropriate professional values and the ability to reflect on practices and contexts; - and develop abilities for reflection including the ability to reflect on their own and other's value systems, development and practices ***Particular to Teacher Education*** - Competence in a number of teaching/learning and assessment strategies and understanding of their theoretical bases; - Ability to create an equal and fair climate conducive to learning for all learners regardless of their socio-cultural-economic context.	***Common to Teacher Education and Education Sciences*** - Capacity to learn; - Communication skills; - Team working skills; - Information technology skills; - Problem solving; - Autonomy; - Reflection skills; - Interpersonal skills; - Planning and time management; - Decision-making; - Appreciation of diversity and multi-culturality; - Ethical commitment; - Critical and self-critical abilities; - Capacity to improve their own learning and performance, including the development of study and research skills; - Ability to analyse, synthesize, evaluate, to identify problems and work out solutions; - Firm knowledge of profession in practice.

The Second Cycle (Masters)

Key subject specific competences	Key generic competences

Common to Teacher Education and Education Sciences	Common to Teacher Education and Education Sciences
- Competence in collaborative problem solving of educational issues in a variety of contexts; - Ability to adapt practices to specific educational contexts; - Development of knowledge and understanding in their chosen area of professional specialization in a major educational field – educational management and administration; curriculum studies; educational policy; adult education; learning difficulties; children's literature; - Ability to use research appropriate to discipline to inform their practices; - Ability to reflect on values appropriate to educational activities.	- Research skills; - Leadership skills; - communication skills, including the ability to communicate in advanced professional registers; - Ability to reflect upon and evaluate own performance; - Development of advanced cognitive skills associated with knowledge development and creation.

Third Cycle Teacher Education & Education Sciences (Doctoral)

Key subject specific competences	Key generic competences
- Acquisition and understanding of a substantial body of knowledge which is at the forefront of a field of learning in the field of Education; - Exercise personal responsibility and largely autonomous initiative in complex and unpredictable situations, in professional or equivalent contexts related to Education as a broad field; - Learn to critique the broader implications of applying knowledge to particular educational and professional contexts; - Scrutinise and reflect on social norms and relationships within their particular field of Education and lead action to change them; - Capacity to conduct (original) research; - Demonstrate the ability to perform independent, original and ultimately publishable research in the different fields of Education and/or school pedagogy.	- The creation and interpretation of new knowledge, through original research, or other advanced scholarship, of a quality to satisfy review by peers at national and international levels; - Ability to demonstrate a significant range of the principal skills, techniques, tools, practices and/or materials which are associated with a field of learning; - Develop new skills, techniques, tools, practices and/or materials; - Respond to abstract problems that expand and redefine existing procedural knowledge; - Communicate results of research and innovation to peers; - Engage in critical dialogue; - Lead and originate complex social processes within their professional domain; - Critical competences, i.e. critical and self-critical abilities; - Presentation and defence in public of scientific studies; - Creativity.

Moreover, in line with Tuning, the introduction of a three-cycle system signifies a shift from a teacher-centered to a student-centered approach (Birtwistle et al., 2016; González & Wagenaar, 2008; Kehm, 2010). Tuning has been based on the philosophy that the paradigm transition from an input-based to an out-based higher education system can only beneficially come about when practitioners and stakeholders (students, academics, and employers) are actively engaged in developing learning strategies and outputs (Isaacs, 2015). Hence, Tuning has arranged a Europe-wide consultation process involving businesses, alumni, and academic faculty to determine the most significant competences that should be developed in a degree program. The results of this consulting process are presented in a list of reference points identified in each subject area, including subject-specific and generic competences.

For each of the nine disciplines included in the Tuning project (Economics, Chemistry, Education Sciences, European Studies, History, Geology, Mathematical Sciences, Nursing, and Physical Sciences), particular competences have been defined. As an example of Education Sciences, the specific competences recognized are listed in Table 5.

As mentioned above, the Tuning project follows a common methodology. Since not everyone is possibly familiar with how the methodology has developed, we will describe and explain it below, especially insofar as the lines are related to the student-centered approach and students'

competence. Five lines of approach have been identified in the subject areas:

a) Generic competences or transferable skills;

b) Subject-specific competences;

c) The role of ECTS as an accumulation system;

d) Approaches to learning, teaching and assessment;

e) The role of quality enhancement in the educational process (emphasizing systems based on internal institutional quality culture).

In the first two lines, academics surveyed the importance and the degree of achievement of the generic and subject-specific competences, to formulate a list of competences (as Table 5 shown). Based on the Tuning lines, it implies three aspects should be considered while designing the study program or course. First, the need for a study program or course must be identified and established by consultation with the relevant stakeholders (Gvaramadze, 2008). Second, the degree qualification must be well-described in terms of the aims and objectives of the course formulated as intended learning outcomes, in turn, expressed in the form of knowledge and generic and specific competences to be achieved (Zaggia, 2008). Third, in addition to identifying and describing the competences related to the subjects, the course design process should consider that one of the primary goals of higher education is to encourage students' autonomy in learning. Thus, the course design needs to take the students' employability and the cultivation of citizenship into account (Cinque, 2016; Ornellas et al., 2018).

The third and fifth lines are much related to our research topic, linking the relationship between the student-centered approach and students' competence. In Tuning, the measurement of student workload is regarded as one of the most crucial instruments for planning and administering degree programs and courses in higher education. Student time is not considered a non-valuable commodity. Instead, as the most important parameter (Adam, 2004). From this perspective, teachers and educators are 'utilizing' an 'expensive' resource and must employ it in the most effective approach, possibly student-centered learning, to realize the desired outcome (Eizaguirre et al., 2019).

The third line is, therefore, one of the foundations for the fourth one, which comprises aligning learning, teaching, and assessment methods and criteria with the intended competences. This move may stand to reason, but many higher education systems are still operated as conventional input systems, wherein students are 'taught' the course content and then evaluated on their knowledge using methods such as standardized examinations or essays, without recognizing the responsibility of forming or improving more complex competences through the proper learning approach, and assessing their achievement in an appropriate manner (Gibson et al., 2019; Plush & Kehrwald, 2014). In order to make the work of academics in formulating useful reference points productive, the course design should start by taking the chosen competences one by one, adopting innovative learning and teaching approaches, and examining how each can be most effectively learned, taught, and assessed.

The last Tuning line is concerned with quality. It includes the process of assessing, designing, or re-designing courses or degree programs based on the results of the prior lines, while continuously monitoring and adjusting (Ateaga et al., 2020). The main concerns are the quality of the process and the extent to which stated learning objectives have been met. Improving the quality of the delivering course necessitates continual assessment and adjustment, which implies a continuous update of teaching and learning methodologies and targeted learning outcomes.

Overall, the increasing relevance of learning and teaching in the Tuning project, with an emphasis on learning outcomes, competence-based, and student-centered education processes, is generally congruent with the characteristics of the current phase of Bologna reform. To date, a significant amount of evidence suggests that the Tuning project has been proven to be productive (e.g., Pálvölgyi, 2017; Serbati, 2015). The expected change is to shift from an expert-driven educational model to a student-centered one, widely recognized as necessary for developing the competences needed in the 21st century (Wagenaar, 2021). However, in practice, it is inadequate as a trigger for change, encountering problems such as insufficient learning alignment, diverse behaviors displayed at various institutions, etc., despite its intention to do so.

Moreover, during the development of Tuning, it evolved into a set of complicated, multilayer policy implementation instruments with a broad range of stakeholders. The center of gravity moved from policy making to policy implementation. The center of gravity moved from policy making to policy implementation (Wagenaar, 2022). It implies that the initial unilateral process has been replaced by a model of multi-level governance involving various stakeholders. Regrettably, stakeholders in the process do not appear to be fully cognizant of this reality, resulting in insufficient interaction between the involved players and the various decision-making and execution levels (Wagenaar, 2019). Over the years, the virtuous endeavor became bogged down in a repetition of pledges that many of the participating nations only partially fulfilled, in fact (Wagenaar, 2022). Thus, making policies to reality, there is still a long way to go.

2.5 Student-centered philosophies and related policies analysis: Context in China
2.5.1 Philosophies of student-centered approach through Chinese lenses
Traditionally, Chinese culture, which has historically been heavily influenced by Confucian culture, has traits of a collectivist society, values harmony, and has high esteem for education and teachers (Wei et al., 2015). To Chinese students, the teacher is the source of knowledge (Doyle, 2005), and it is uncommon for them to argue with their instructor. The teacher is a revered mentor, a guru, and a symbol of authority (Watkins & Biggs, 2001), accorded the highest public respect, and regarded as having the utmost significance in education (Coughlan, 2013; Dolton et al., 2018). In China, as well as the Asian society as a whole, teachers play crucial roles in transmitting knowledge, morals, and values in the educational process (Abdullah, 2020). Regarding such authority, some academics shared their experience or opinions:

According to my experience as a teacher and student in Sichuan, China, a teacher is absolutely respected without question ... The teacher teaches and is right, and the student studies and is wrong (Hessler, 2001, p. 68).

In China, teachers are viewed as the authority. Such a culture, in addition to being part of Chinese heritage, is developed by government policy through the adoption of standardized textbooks, and by the highly regulated, centrally controlled curriculum (Biggs, 1996).

Visibly, it is common to use the traditional text-based, teacher-centered approach in China in the past. Some researchers further indicated that Chinese educators favor teaching at the lower three tiers of Bloom's taxonomy (knowledge, comprehension, and application) and rely on rote learning and lecturing at the expense of the development of student's analytical, synthesis, critique, and evaluation skills, among others (Hu, 2019; Wang & Farmer, 2008; Wei & Ou, 2019). As per Wang (2007), flexibility, problem-solving, critical thinking, and independent learning are not conventionally regarded as essential. This resulted in the phenomenon that it is not usual to

question or dispute with a teacher or to criticize the course material in China, as in many Asian countries, especially before this century (Burnard, 2006; Kennedy, 2002). Even teachers have limited autonomy in selecting textbooks, which are frequently the same across the country, despite the fact that some are outdated (Zhao, 2020). Some academics suggested that Confucianism is thought to be the source of this learning philosophy, which urges teachers to convey profound respect for old knowledge rather than motivating learning and refrain from assessing or debating it (Chan, 2019; Kim, 2022). As a result, education in China is typically viewed as the transmission of knowledge rather than promoting students' knowledge construction, as it is in the West.

In general, the majority of Chinese educational philosophies continue to embrace the concept of teaching. There is a widespread assumption that teaching and learning in Chinese and even Asian contexts rely primarily on book learning and memorizing rather than developing higher-order cognitive thinking (e.g., Ballard & Clancy, 1994; Lin, 2009). The teacher is perceived as a figure of authority who imparts knowledge to students, who are regarded as "receptacles" and "filled" with the material presented by their teachers, with the main objective of performing well on standardized examinations (Ho, 2018). In this sense, teachers and textbooks are considered as the ultimate source of information, whereas students are inactive, quiet, and uninvolved in the course. Such a teaching and learning approach is condemned and criticized by stakeholders for a variety of reasons, including the ineffectiveness of surface learning (Robertson et al., 2000), students' lack of creativity (Clarke, 2010), and lack of critical thinking (McConnell, 2018; Song, 2016), and so on. Thus, the views mentioned above are recognized to contradict the constructivist paradigm, which lays greater emphasis on the roles of the learners.

However, other experts point out that these ideas do not adequately depict true Confucianism and reflect an oversimplified understanding of Chinese educational philosophy (Abdullah, 2020; Hall & Ames, 1987). Another mainstream view submits that Confucian cultures also contain active learning and deep learning perspectives, promoting Chinese students to acquire high-order thinking (Chi et al., 2017; Zhao, 2013). In the Chinese setting, the approximately 2,000-year-old Confucian education tradition has been highly regarded (Ho, 2018). As the first educational and political revolutionary in China, Confucius (sometimes spelled Kongzi) played a significant role in shaping the society, exerting a cross-border influence on generations, eras, and regions (Cho & Lee, 2001; Chuang, 2007).

In truth, Confucius was not a proponent of rote memorizing of textual knowledge (Tan, 2015). Chinese students do learn by understanding the knowledge contained in the material or provided by the instructor (Chan, 1999; Wen, 2018). Nonetheless, observing the meaning of "knowledge" in Chinese, also known as "*Xue Wen*" (学问), we could find that it is comprised of two components. One is "learn" (学), and the other is "question" (问) in English, which might be understood as meaning that knowledge is obtained by observation and asking questions, as opposed to memorizing (Kennedy, 2002).

Furthermore, Kongzi encourages self-reflection during the learning process, as learning (学) and introspection (思) are intrinsically tightly linked. Confucius uttered a famous proverb that is well-known in China, "Leaning without thinking leads to confusion; thinking without learning ends in danger" (McEnroe, 2014). Put simply, one who learns without reflecting will be unable to completely comprehend what has been learned, while someone who counts on introspection sans learning will find it challenging to reflect meaningfully, as knowledge is acquired via learning. Thus, Confucius held that the student should take an active role in the learning process, in which

they are involved in self-reflection and practices (Li, 2015; Liu, 2013). It is consistent with the Constructivist-proposed knowledge construction principles. Learners will participate in higher-order thinking processes to enhance their skills like critical thinking during self-reflection, which is crucial for understanding one's knowledge, limitations, and prejudices, thereby realizing self-improvement (Pham & Pham, 2021; Sung, 2015). When self-reflection is incorporated, learning is much more effective. This shows that Chinese students are not only passive "information sponges" since the Confucian philosophy of education requires students' active learning and reflection.

Contrary to appearances, students in Confucian cultures do not merely indulge in superficial memorization. According to Biggs (1996), adopting memory and repetition does not necessarily reflect a shallow learning approach but instead coordinates the sophisticated and synthesized expression. Effective or profound memorizing, on the basis of reflective repetition, is a crucial approach to learning anything complicated, and it is commonly employed in Asian education (Kember, 1996; Li & Cutting, 2011). It is the process of inductive learning, in which the formation of concepts and the deduction of higher-level principles by repeated practice and memory of concrete examples (Rhee & Kim, 2019; Watkins & Biggs, 1996). The argument that memory also has the potential to lead to deep learning is, literally and content-wise, contrary to the constructivist approach to learning. But Confucius believed that learning is a very individualized activity, and that once learning has been undergone, students can repeat it, in order to master the knowledge and skills (You, 2019). It is compatible with Dewey's (1929) perspective that learning is not an end in itself, but a continual journey from practice to theory and back again.

Another significant feature of Confucianism is centered on the teaching and learning of "*Ren*" (仁), the benevolent interaction between individuals (Tan, 2022). It stands for the teaching objectives of emphasizing moral education and the development of personal qualities, which is a significant component of attitude (Sheng, 2019). Kongzi advocated moral education in three steps: knowledge, humanity, and courage (Sun, 2013). He thought that teachers should have a passion and a caring heart for their students (Shim, 2008), notwithstanding their socioeconomic and intellectual backgrounds (McEnroe, 2014; Tan, 2020).

Besides the mentioned above, Confucius proposed many Confucian teaching methodologies to motivate students to learn and develop their competence. For example, Confucius stressed that the course content and teaching methods should be appealing to students in order to arouse their desire to learn (Liu, 2013; So & Hu, 2019). He also accentuated individual learning, arguing that different methods should be used for different students or content, as individuals have diverse potential and learning paths (Cheng, 2011; Zhou et al., 2019). Collaborative learning and reviewing past learned knowledge before acquiring new knowledge are also the beliefs in teaching and learning conveyed by Confucius (Bahtilla & Xu, 2021; Li, 2018).

In summary, while the educational philosophy of Confucianism shares some parallels with constructivism in western society, there is one fundamental difference between them: teaching and learning begin with the teacher in Eastern culture, who is placed at the center of the educational process. This viewpoint is further reinforced by Pham and Phan (2020), who note that the Asian civilization has a rich arena of philosophical and ethical-social-political thought. Chinese teachers have a tendency to assume that they possess a vast amount of information, can convey this knowledge to their students, and are responsible for evaluating their students' development. Although Confucius emphasizes some beliefs which are beneficial to promoting students' learning

and never says that learners are required to entirely obey their teachers, respecting the teacher has been the tradition developed by Confucians (You, 2019). As is common knowledge, compared to western students, Chinese students are quieter and more submissive. Therefore, to motivate Chinese students to learn and actively engage in learning, it is necessary to strike a good balance between verbal interactions and silent learning culture (Pham & Pham, 2020). There is also a need to formulate feasible pedagogical and assessment practices that can integrate multiple intellectual traditions during the teaching and learning process (Abdullah, 2020).

2.5.2 The policies analysis of student-centered approach

In apparent contrast to the European higher education system, the party-state remains dominant in China's education system. Under the leadership of the Chinese Communist Party, the Ministry of Education, a constituent department of the State Council of the People's Republic of China, is in charge of organizing and directing the education system. The MOE (2009b) specified and outlined its responsibilities, among which, the following are two main relevant to our topic, as follows:

1) *To draw up strategies, policies and plans for educational reform and development; and to draft relevant rules and regulations, and supervise their implementation.*

2) *To take charge of the overall planning, coordination and management of all forms of education at various levels; to formulate, in collaboration with relevant departments, the standards for the setting-up of schools of all types at various levels; to guide the reform of education and teaching methods; and to take charge of the statistics, analysis, and release of basic educational information.*

It is evident that in China, the MOE is burdened with the responsibility of guiding the reform of teaching and learning by the overall planning, formulating policies, and supervising their implementation. The top-down model is similar to the Bologna Process – the student-centered approach is driven by the Ministerial Conference. However, since party-state centrism and authoritarianism are significant features of higher education in China, the policy is, for the most part, geared towards the strategic and contextual needs of the Party-state with the use of hard-power means or resources (Lo & Pan, 2021). Thus, higher education development in China is strongly influenced by state policy. Much evidence proves that the top-down model appears more appropriate and effective than others in China, for strong policy implementation, efficient allocation of resources under government intervention, and timely response to external environmental changes and demands (e.g., Hartley & Jarvis, 2021; Song, 2018). Although China has developed into a superpower of higher education, in terms of "soft power," which comprises university teaching and learning quality, research innovation, and cultural innovation, top-down policies do not seem to work in a short period because it requires a subliminal process (Zhou & Wu, 2016).

Reforming teaching and learning is a difficult endeavor. However, Chinese policymakers are still conscious of the need to shift toward a student-centered approach triggered by one key crisis. China's higher education system has witnessed fast expansion since the government's 1999 adoption of the expansion policy, a strategic choice to boost university enrollment (Bie & Yi, 2014). According to the newest report by MOE of China, the gross enrollment rate and the number of students in all forms of higher education have increased from 10.50% and 7.18 million in 1999 to 57.80% and 44.3 million, respectively, in 2021 (MOE, 2000, 2022). During these two decades, higher education in China has undergone a leap from elitism to popularization, and is now in the

stage of universalization. It means higher education in China has benefited ordinary people rather than the elite group only, and is continuing to expand its coverage. Yet, the rapid growth in the scale of higher education has prompted public concerns about its quality, for example, how to ensure students' educational gains and personal development (Chi et al., 2017; Marginson, 2011). In response, policies and practices to improve the quality of learning and teaching in colleges and universities have been issued. Advocating student-centeredness is an unavoidable tendency in the evolution of global higher education, as well as an essential requirement for China to enhance the quality of its higher education. Despite the introduction of a range of related policies in China since the turn of the century, embracing the student-centered approach in China still faced considerable challenges (Tsegay, 2015; Tsegay et al., 2022).

In China, national-level policies released by the Ministry of Education have a general influence and normative effect on reforming teaching and learning. This represents the macro-level perspective; analyzing it enables academics to organize and convey ideas close to the action-determining factors encircling a core group of political society officials (Snyder et al., 1954). Moreover, the micro-level, including the teacher-student viewpoint and classroom-level implementation, was typically driven by national policy. As such, this section focuses on policy analysis of the student-centered approach in China's higher education to develop a general understanding of the Chinese situation. Next, in Section 2.5.3, we will proceed to study the relevant students' competence development policies in a similar manner.

Data collection. The policy documents pertaining to the student-centered approach were collected from the official website of the Ministry of Education of the People's Republic of China (Chinese version). The researcher conducted a keyword search on the *Public* (i.e., official documents and public documents issued by government departments) option, from 1999 to 2022, using the Chinese phrase "student-centered." The search results show that there are 68 policy documents. After carefully screening each document to exclude those in other fields like elementary or secondary education, vocational education, and those not belonging to teaching and learning, we identified a total of 25 documents that could be used as data for our study.

Methodology and data analysis. To achieve our objective, we utilized content analysis, a traditional qualitative research analysis, to identify and investigate the components in selected policy documents. Each selected policy document was analyzed using the qualitative content analysis technique: upload, coding, classification, identification of main themes, conceptualization, and analysis using Qualitative Data Analysis software Nvivo 12 (Basit, 2003; Glesne, 2016). As proposed by Miles et al. (2018), these document data underwent multiple cycles of thematic coding analysis. In the first cycle of coding (a priori coding), based on the material relevant to our key concept student-centered, the data were preliminarily categorized into main codes and subcodes, such as talent development, teaching method reform, and curriculum system reform, among others. In the second coding cycle, codes and subcodes were added based on inductive coding. Once the main codes and subcodes had been defined and discussed by the researcher's supervisor and peers, the researcher coded all data. In total, five main codes and 16 subcodes were identified. Table 6 displays the main codes and subcodes, as well as examples of each subcode. All sub-codes were plotted against the main codes to understand the underlying elements in guidance proposed by the government.

Table 6. Code-book of policy documents related to student-centered

Main codes	Subcodes	Examples
Institutional support	Management system	To protect students' rights, the student management system should be student-centered, reflecting the values of fairness and impartiality, and nurturing-oriented; Improving the teaching incentive and constraint system to mobilize and bring into play the teaching enthusiasm of teachers; Develop an evaluation system that is conducive to "teaching and education".
	Operation mechanism	Improving mechanisms that facilitate the development of students' individuality; Active development of various forms of joint training mechanisms.
Teaching staff	Role	Give full play to the leading-guide role of teachers in teaching and learning.
	Faculty development	Actively implement the strategy of strengthening the university with talents to improve the overall quality of the teaching staff.
	Teacher professional development	Teacher development centers are universally established to carry out teacher training, teaching consultation services, teaching quality assessment, and sharing of quality teaching and learning resources to improve teachers' teaching abilities.
Mission	Meet national needs	Cultivate high-level medical talents to adapt to the development of China's medical and health career, and improve the level of China's medical and health services and international competitiveness.
	Improving teaching and learning quality	Improving the quality of teaching and learning and promoting the connotative development of higher education.
Disciplines	For all disciplines	Policy document, such as *National Standards for Teaching Quality of Undergraduate Specialties in General Higher Education Institutions*.
	Medicine	Policy document, such as *Opinions on the Implementation of the Excellence in Medical Education and Training Program*.
Talents training	Transforming the concept	Adherence to the three main concepts of student-centeredness, output orientation and continuous improvement; Define the students' main position in teaching and learning.
	Teaching method reform	Establish the student-centered independent learning model; Promote heuristic, inquiry, discussion, and participatory teaching and learning.
	Curriculum system reform	Promote the reshaping of the student-centered curriculum system, reform the curriculum content, and facilitate the transformation of teaching from "teaching well" to "teaching well" and "learning well."
	Ensuring activities (especially practice)	Carry out teaching and learning activities that can effectively promote interaction and communication; Increase the course hour for experiments, practical training, and

	internship to enhance students' practical skills and realize social practice to educate people.
Students' competence development	Cultivate well-rounded students with a sense of social responsibility, innovation, practical ability, humanistic sentiment and global vision.
Revision of training objectives	Revise the professional talent training program, and take innovation spirit, entrepreneurial consciousness, and innovation and entrepreneurial ability as important indicators to evaluate the quality of talent training.
Evaluation and assessment reform	Improve the assessment and evaluation methods of students' competence and coursework; Focusing on the learning process and assessment of students' competence.

Findings. According to the findings of Su et al. (2022), the timing and amount of policy announcements over the years (1978–2022) demonstrate that university teaching and learning reform in China has never ceased. However, in the process of data searching and sifting, the researcher found that the first document that proposed student-centered in higher education was published in 2009, *Several Opinions on Strengthening Medical Education Efforts to Improve the Quality of Medical Education* (MOE, 2009a). Since then, the policy emphasis on student-centered has grown increasingly apparent. Moreover, as far as the national level is concerned, five priorities elements of the student-centered approach have been emphasized in relevant policies, as main codes are shown in Table 6, namely, 1) institutional support; 2) teaching staff; 3) mission; 4) disciplines; 5) talents training. Subcodes and examples within these themes enabled more specific analysis of the data. In the following, we will analyze and discuss each of these codes in depth to reveal how Chinese policies put forward the request for a student-centered approach and to guide.

Table 7. The situation of subcodes' data sources and reference points within the main code "institutional support"

Subcodes	Number of data sources	Reference points
Management system	18	69
Operation mechanism	14	30

Institutional support. Student-centered approach as a holistic paradigm shift requires appropriate management systems and operation mechanism support. As indicated in Table 7, there are 18 policy documents pertaining to enhancing the management system and 14 for operation mechanisms. Specifically, the change to a student-centered approach necessitates the reform of numerous systems, including teacher recruiting (4 data sources), evaluation (5 data sources) and promotion (six data sources) systems, instructional evaluation systems (10 data sources), teaching management systems (8 data sources), and student management systems (2 data sources). Correspondingly, the operational mechanism in practice should also be matched with management system reform. For instance, it has been proposed to alter the teacher evaluation mechanism to adjust the weight of teaching performance in teachers' performance and motivate teachers to devote more time to teaching. In this regard, some Chinese academicians concur that there is a need to establish an administrative system to support student success (Zhang, 2012). However,

there appears to be decoupled between policy and implementation. According to Chen (2017), an empirical study based on undergraduate classroom performance records from 51 universities in China revealed that student-centered approaches have not yet been generally implemented in classroom practices. It implies that, in reality, the teacher-centered approach remains the predominant mode of university instruction.

Teaching staff. As one of the most significant stakeholders, teachers perform a prominent dominant role in higher education classrooms. Along with promoting systemic reform regarding teachers, in terms of individual teachers, the policies reiterated the role of teachers and highlighted teacher professional development. At the institutional level, the policy concerns the construction of a university teaching force (as shown in Table 8). Regarding the role of teachers, the researcher found two statements in the policies. One claim is to insist on the main position of teachers in university operations. The main role of students in teaching and learning is identified, while the leading role of teachers in teaching and learning is highlighted (e.g., MOE, 2009b). Other policies state that both teachers and students are in the key role of teaching and learning (e.g., MOE, 2012a). This means the underlying philosophy of "dual-centeredness", which is an integrative model beyond the dichotomy of student-centered approach and teacher-centered approach (Lin & Wang, 2017; Yang & Lin, 2016). These two approaches are mutually rely on each other to improve the quality of teaching and learning.

Furthermore, teacher professional development, including attention to teacher planning and instruction, has become a growing concern as it can impact instructional practices (Nordgren et al., 2021; Wei et al., 2009). In Chinese policies, beyond encouraging universities to establish teacher development centers, policies make a number of other recommendations, such as strengthening teacher training and exchange, introducing case observation classes to help teachers update their teaching concepts and improve their ability and proficiency in teaching, providing more opportunities for teachers to participate in study abroad programs and establishing a long-term mechanism to promote teacher professional development. (e.g., MOE, 2009a, 2015, 2016a). The practice of the student-centered approach sets more demands on the pedagogical competences of educators. There is substantial evidence that teacher professional development has a positive relationship with the student-centered approach. According to Borko (2004), teacher professional development is not only advantageous for teachers' knowledge and skills, but it also has the potential to benefit student achievement. In the meantime, increased engagement in professional development led to improvements in the self-reported implementation of student-centered instruction (Heck et al., 2008; Wilson et al., 2015).

Besides, the faculty's strength also impacts the quality of instruction and education. As such, some policies emphasized the development of the teaching staff. For example, China is embarking on a project to construct virtual experimental teaching and learning. The associated policy intends to highlight the concept of student-centered experimental instruction, develop a dedicated and professional experimental teaching team, and constantly improve the quality and effectiveness of experimental teaching and learning (MOE, 2018a). From 2019, The quality of teaching and learning is a high priority for the development of world-class undergraduate majors. The Ministry of Education (MOE) stated further that the development of teaching faculty and grassroots teaching organizations should be consistently bolstered to enhance the overall quality of teaching and learning (MOE, 2019).

Table 8. The situation of subcodes' data sources and reference points within the main code "teaching staff"

Subcodes	Number of data sources	Reference points
Role	3	5
Faculty development	6	10
Teacher professional development	10	19

Table 9. The situation of subcodes' data sources and reference points within the main code "mission"

Subcodes	Number of data sources	Reference points
Meet national needs	25	31
Improving teaching and learning quality	21	62

Mission. The finding demonstrates that the mission of applying the student-centered approach to develop talents is to meet national demands and improve teaching and learning quality (as Table 9 shown). China, as a developing country, facing a rapidly changing society, the demand for talent is inclined to meet society's needs and practical applications. The researcher noticed that all policies begin with reference to the fact that the preparation of students should be demand-driven to meet national development needs. For instance, significant talent gaps exist in China's manufacturing industry, and individuals with sound professional and independent learning skills are required (Zhou, 2019). Higher education institutions, which may effectively mitigate this issue, shoulder the glorious mission and responsibility of promoting social and economic development.

Moreover, the terms quality of education and quality of talent training repeatedly appeared several times in government policy. It is visible that quality is the focal point of Chinese higher education (Li, 2010; Liu & Liu, 2017). The quality of teaching and learning is increasingly concerned, as it is essential for students' competence development. Therefore, innovative teaching and learning approaches were not only adopted to foster competent students for national construction, but also to enhance the quality of teaching and learning.

Table 10. The situation of subcodes' data sources and reference points within the main code "disciplines"

Subcodes	Number of data sources	Reference points
For all disciplines	23	23
Medicine	2	2

Disciplines. As mentioned in the mission, in China, talent training is oriented to serve the demands of society. As presented in Table 10, the data reflects that of the 25 student-centered related materials, 23 are targeted to all disciplines, and two are geared toward medicine. This indicates that China attaches particular importance to the cultivation of medical students. The Ministry of Education asserts that given the national situation, China requires high-level medical talents who can cater to medical and healthcare development; It is necessary to strengthen the capacity and international competitiveness of China's medical and healthcare services (MOE, 2012b). Especially since the pandemic, the State Council (2020) also promulgated the *Guiding Opinion on Accelerating the Innovative Development of Medical Education*, stating that it should

deepen the reform of teaching content, curriculum system, and teaching and learning methods of undergraduate medical education, focus on improving the quality of teaching and learning, and cultivate medical talents with benevolent hearts and skills.

Talents training. As indicated in Table 11, We have induced seven subcodes within the original data, which are the significant influencing factors of student-centered, closely linking to our research topic, including transforming the concept of teaching, teaching method reform, curriculum system reform, evaluation and assessment reform, ensuring activities (especially practice), students' competence development, and revision of training objectives. Talent training as a systemic project, like the student-centered approach as a paradigm, is not determined by a single factor, but by a number of interlocking elements. As the *Guiding Opinions on Accelerating the Construction of "Double World-class" in Higher Education Institutions* state, to speed up the construction of world-class universities and disciplines, there is a requirement to comprehensively raise the capacity of talent cultivation and improve the overall level of higher education in China (MOE, 2018b). A series of related guidelines and goals were put forward, such as encouraging students to participate in teaching and learning reform and innovative practices, reforming the learning evaluation and assessment system, stimulating students to independent learning, guiding students to grow and become successful, developing a high-level talent training system, and training a group of innovative and top-notch talents for the nation (MOE, 2018b, 2019). Following is a discussion of each of these seven subcodes.

Table 11. The situation of subcodes' data sources and reference points within the main code "talents training"

Subcodes	Number of data sources	Reference points
Transforming the concept	17	27
Teaching method reform	19	55
Curriculum system reform	16	42
Ensuring activities (especially practice)	12	25
Students' competence development	16	49
Revision of training objectives	11	23
Evaluation and assessment reform	19	38

As for transforming the concept, teachers' implementation of student-centered approach will be affected by their beliefs (Czajka et al., 2019; Wang & Chin, 2021). Many policies have clearly proposed to change the traditional teaching model and adhere to the concept of student-centered teaching and learning, starting from the needs of students (e.g., MOE, 2017a). There are also quite a few policies that align the student-centered concept with students' competence development, with a view to stimulating students' interest in learning, enhancing the spirit of innovation and social responsibility, and promoting students' overall development (MOE, 2019). Theoretically, it appears that enabling teachers to adopt a student-centered philosophy actively could be beneficial in their action shifting from teaching to learning. However, concept change is hard (Palak & Wall, 2009). In practice, Li (2015) found that, despite realizing the importance of a student-centered approach, university teachers still favor direct guidance in the teaching and learning process and are conservative when it comes to student autonomy, which is consistent with Chen and Zhang's (2019) result.

Curriculum reform and teaching and learning reform are frequently referenced jointly, with the student-centered approach being a key part of both. For instance, to achieve "overtaking" the quality of teaching and learning in higher education, the Ministry of Education declared that it would continue to encourage student-centered curriculum reform and improvements in teaching and learning approaches (MOE, 2017a). On top of that, online courses have gradually become a trend in recent years. The Ministry of Education has outlined six requirements for online open courses: course faculty team, course design, course content, teaching activities and guidance, application effectiveness and impact, and course platform support services. Therein, the document particularly points out the need to highlight student-centered course design, establish a new type of student-centered teaching-learning relationship, and construct a course structure and teaching and learning model that reflects the deep integration of information technology and teaching and learning (MOE, 2018c). Changing the curriculum has been considered as an effective means of altering classroom practice and impacting student learning to suit the ever-evolving needs of the global community (Cai & Ni, 2011; Zhao & Watterston, 2021).

Moreover, the innovative approach to education is a element in developing new knowledge, competence, and personal attributes (Gaybullaevna & Jonpulatovna, 2021). In accordance with the Ministry of Education (2019), central to the reform aims at cultivating students' higher-order thinking skills and encourage all-around development. With respect to pedagogical change, the students' autonomy is being emphasized in the transformation (Lu & Liu, 2016, MOE, 2017a). However, practically, there are still some challenges to implementing the student-centered approach, such as the imbalance issue. This imbalance is reflected first of all in the differences between colleges and universities in different regions, due to the fact that the student-centered approach depends to a large extent on the teacher's competence and institutional support (Tam et al., 2009; Xue & Guo, 2020). In addition, at the course level, despite the fact that a student-centered approach could enable students to exchange ideas and experiences, learn collaboratively, and apply content-based knowledge to real-world challenges, a big problem still arises in recognizing and embracing every student's equal in-class engagement (Xu & Guo, 2018). Certain students are dominant, while others rarely involve in interaction (Tsegay, 2015), since the students' interaction is highly affected by the experience and perception of teachers.

Alongside curriculum and teaching and learning reforms, ensuring students' participation in more practical activities is also noted in policy documents, and these measures are all geared toward students' competence development. According to the data, students' competence includes three main dimensions: professional knowledge and skills, generic skills such as independent learning skills, critical thinking, innovative skills, and attitudes like responsibility, values, and ethics. Of these, the cultivation of students' practical and innovative skills is repeatedly mentioned several times, which implies it is the focus and priority of the government's concern. For example, in terms of training medical talents, the Ministry of Education has explicitly pointed out that it should intensify the clinical practice teaching sessions and ensure the quality of internships so that students can systematically master theoretical knowledge, improve their clinical practice skills, and their ability to solve practical clinical problems, promote the integration of medical teaching and research, cultivate medical students' potential for clinical diagnosis and research innovation, as well as strengthen students' medical ethics (MOE, 2012b, 2017b). For other disciplines, the Ministry of Education has also stated that it is necessary to strengthen the experimental, practical training, and internship segments and establish a quality assurance mechanism, with the objective

of developing students' practical and innovative skills (MOE, 2015a). Apparently, the student experience is critical to developing students' competence (Buckley & Lee, 2021). This experience includes not only academic but also social participation, not only in the classroom but also in extracurricular involvement (Bao & Du, 2016). In this sense, institutions should provide various opportunities for students to participate actively in practice in order to develop students' competence better.

Many policy documents related to student-centeredness urge for the timely revision of talent training programs, especially in specific subjects, to suit the requirements of societal growth while prioritizing the development of students' competence. The policy documents declare that:

- Revise the training objectives for professional talents in a timely manner, innovate the mode of talent training, and promote high-level medical talents who can adapt to the development of China's medical and healthcare systems (MOE, 2009a).

- Encourage normal universities and colleges to transform their way of thinking about institutions administration in order to serve local economic and social development better, to promote application-based skilled talent, and to boost students' employability and entrepreneurship abilities (MOE, 2015b).

- Revise the professional talent cultivation program and take innovation spirit, entrepreneurial consciousness and innovation and entrepreneurial skills as important indicators to evaluate the quality of talent development (MOE, 2016a).

- Continuously enhance the mechanism of collaborative education and practical instruction, and optimize the talent training objectives in line with the requirements of social growth (MOE, 2019).

Last but not least, evaluation and assessment reform is a key dimension to improving the quality of talent training. In 2018, China's Ministry of Education released the first national standard for teaching quality in higher education – National Standards for Teaching Quality of Undergraduate Specialties in General Higher Education Institutions – underscoring that higher education institutions should establish a quality assurance system, combine normal monitoring with periodic assessment, provide timely evaluation and feedback, and continuous improvement, and promote the ongoing enhancement of teaching and learning quality (MOE, 2018d). In particular, course assessment should focus on the learning process and students' competence assessment, especially applying knowledge to analyze and solve problems, reform the content and mode of coursework assessment, and explore a new model of non-standard answer-based examination (MOE, 2016b, 2018e).

Some studies affirmed the values and significance of evaluation and assessment reform. Ongoing evaluation and assessment of student learning serve as a key element in supporting the student-centered approach (Basham et al., 2016; Darling-Hammond & Richardson, 2009; Lancaster & Topper, 2022). Further, Zhang et al. (2021) found that frequent use of student assessments substantially enhanced the likelihood that a teacher would employ the student-centered approach. As opposed to standardized tests, formative assessments are more sensitive to particular settings and pedagogical objectives, allowing teachers to effectively track how and what students are learning and motivating students to be the masters of their learning (Granberg et al., 2021; Heritage, 2007; Leenknecht et al., 2021). However, evidence from Chinese institutions revealed that teachers have employed a restricted range of formative assessment strategies, and their deployment of these strategies has been largely inadequate. They generally

put a premium on providing feedback and ignore such strategies as information elicitation and student self-/peer assessment (Guo & Xu, 2021).

Overall, examining official Ministry of Education policy documents fails to uncover a formal and unambiguous definition of the student-centered approach. To date, the most widely accepted term for this concept in China is that proposed by Zhao (2016) – the student-centered approach refers to student development, student learning, and learning outcomes – a connotation that is recognized by a large number of Chinese scholars (e.g., Hong & Bie, 2020; Ye & Ouyang, 2022). To facilitate the student-centered approach in higher education, changes should be made to the entire education ecosystem, especially at the institutional and course levels, so that students and instructors can embrace the approach as early as possible (Abdullah, 2020; Hemmati & Aziz Malayeri, 2022; Kaput, 2018). Our finding suggests that for nearly two decades, China is already in the process of making a paradigm shift toward a student-centered approach through a list of policy-oriented education reforms, including the aspects of the institutional system, curriculum reform, philosophy, innovative teaching methods, evaluation and assessment, teacher professional development, and others. These reform policies reflect a transformation from a focus on content norms to a concern for talent cultivation, especially the innovative, skilled talents, and from an emphasis on social needs to taking into account students' needs. In particular, in the current frenetic process of "Double World-class" construction, Chinese higher education regards teaching and learning reform as a systemic program, valuing students' learning process, learning outcomes, and competence development. As stated in the *China Education Modernization 2035*, China's higher education attempts to establish a student-centered talent development system (State Council, 2019). In a nutshell, in China, policy development and strong advocacy for student-centered approach are the positive signs of educational transformation, despite the progress remaining slow due to certain cultural and non-cultural obstacles and challenges.

2.5.3 The policies analysis of students' competence development

In the past two decades, China's policymakers not only have been devoted to promoting student-centered learning but also focused the students' competence. Chinese higher education has been gradually shifting from a focus on producing a large number of academically accomplished graduates to a greater concern for making students employable and able to contribute to the development of society after graduation (Bai, 2006; Ramsden, 2008). Since the 1990s, there have been raising worries about the examination-oriented curriculum that is extent detrimental to students' competence development. It constricts students' creativity, emphasizes competition rather than collaboration and communication between students and teachers, and is ineffective in fostering the skills and dispositions required in a global information society (Dello-Iacovo, 2009; Tan & Hairon, 2016; Wang, 2022). Thus, a curriculum reform process with the aim of shifting Chinese education from a traditional exam-centered approach to innovative teaching and learning methods including the student-centered approach has commenced.

Since the turn of the century, the Chinese Ministry of Education has released a wide range of related policies to steer students' competence development through various means. Following the prior path, this section focuses on analyzing and discussing the policies of students' competence development in China's higher education. The policy analysis mainly centers on three issues, namely: 1) what competence to develop in students, 2) why to develop students' competence, and 3) how to develop students' competence. The researcher hopes to gain a broad understanding of

the Chinese situation through macro-level policy analysis and to remotely echo with the voices of teachers and students in Chapter 6.

Data collection. The policy documents relevant to students' competence development were retrieved from the official website of the Ministry of Education of the People's Republic of China (Chinese version). The researcher utilized the Chinese words "students' competence cultivation" and "students' competence development" to conduct a keyword search on the *Public* option (i.e., official documents and public documents published by government departments), from 1999 to 2022. According to the search results, there are 166 policy documents. By carefully reviewing each material to remove those in domains such as elementary or secondary education, vocational education, and those unrelated to students' competence, we selected 57 documents that could be used as data for our research.

Methodology and data analysis. In line with the student-centered policy analysis route, we adopted content analysis and used the Nvivo 12 as a tool. Several rounds of coding led to the identification of four major codes and 18 subcodes. Table 12 displays the main codes and subcodes, as well as examples of each subcode. All sub-codes were plotted against the main codes in order to examine the answer from the government policy's perspective to the issues we raised.

Table 12. Code-book of policy documents related to students' competence development

Main codes	Subcodes	Examples
Component of students' competence	Professional knowledge and skills	The instruction of physical education courses should focus on the lecturing and analysis of basic theoretical knowledge and cultivate students' skills to apply their knowledge to solve practical problems.
	General skills	Study and learn from western theoretical experience and integrate it with China's reality, enabling students to develop a critical, open and compatible way of thinking and independent learning skills;
		Improve university students' learning, innovation, practical, communication, and social adaptation skills.
	Attitude	Emphasis should be placed on developing students' respect for science, factuality and criticality;
		Integrate the core socialist value system into the whole process of university education to develop ideal, moral, cultured and disciplined university students.
Objective and mission	The demand for well-rounded talents	Efforts should be made to develop more well-rounded, high-caliber specialists by deepening education reform;
		Insist on moral education as a priority, implement quality education in-depth, and focus on mental health education efforts for university students.
	Adapting to social changes and needs	Develop top-notch innovative talents to meet the demands of national economic construction, social development, and scientific and technological progress.
Means of promoting	Environment construction	Strengthen institutional culture and create a positive atmosphere for talent cultivation.

students' competence development	Institutional support and assurance	Strengthen the teaching management and improve the teaching rules and regulations;
		To refine the quality assurance system of teaching and learning.
	Develop teaching faculty	Increase efforts to develop the teaching force and play the important role of teachers in improving the quality of teaching.
	Deepen teaching and learning reform	The teaching and learning process should highlight the main position of students and the guidance role of teachers;
		Emphasize the reform and innovation of teaching methods and promote teacher-student interaction and communication;
		The teaching materials and content should link theory with practice and help students develop practical skills to meet the needs of society.
	Enhance practical activities	Placing great emphasis on the practical part of teaching and learning to improve students' practical skills;
		Fully understand the significance of internship and its important role in cultivating students' practical skills, innovative spirit, and developing a sense of career and responsibility.
	Resource input and optimization	Invest more resources in the construction of teaching materials;
		Provide students with adequate library materials, necessary laboratory instruments and equipment, etc.
Disciplines	For all disciplines	Policy document, such as *Several Opinions on Further Deepening Undergraduate Teaching and Learning Reform and Comprehensively Improving Teaching and Learning Quality.*
	Engineering	Policy document, such as *Opinions on the Implementation of the Education and Training Program for Excellent Engineers in the Field of Land and Resources.*
	Computer science	Policy document, such as *Notice on Further Strengthening the Construction of Exemplary Software School.*
	Agronomy and Forestry	Policy document, such as *Deepen the Construction of "New Agricultural Science" Discipline System and Enhance the Competence of Serving Rural Revitalization Strategy.*
	Physical education	Policy document, such as *Teaching Guidelines for Various Major Courses of Physical Education Undergraduate Programs in General Higher Education Institutions.*
	Medicine and Public health	Policy document, such as *Guiding Opinions on Accelerating the Innovative Development of Medical Education.*
	Musicology	Policy document, such as *Teaching Guidance of the Compulsory Courses of Musicology (Teacher Education) for Undergraduate Majors of National General Higher Education Institutions.*

Findings. In the process of data searching and sifting, the researcher found that from the timing and amount of policy announcements demonstrate that Chinese universities have long valued the development of students' competence. The trend of governmental policy emphasis on students' competence has grown increasingly pronounced and more concretized over time. The

first three main codes contribute to answering the three questions we intended to explore. Specifically, the first main code, "component of students' competence," is for answering what student competence to cultivate. The second one, "objective and mission," is to explore why student competence is valued. The purpose of the third main code, "means of promoting student competence development," is used to respond to the final question – how to develop student competence. Regarding the fourth main code, "disciplines," it is worth pointing out that subject- and discipline-oriented is one of the features of China's higher education. Various competences are required of students in different disciplines. Furthermore, subcodes and examples within these themes displayed in Table 12 enabled a more specific understanding of the data. In the following, we will analyze and discuss each of these codes in depth to reveal how Chinese policies put forward the request for students' competence development and to guide them.

Table 13. The situation of subcodes' data sources and reference points within the main code "component of students' competence"

Subcodes	Number of data sources	Reference points
Professional knowledge and skills	55	168
General skills	42	130
Attitude	32	101

Component of students' competence. As shown in Table 13, we have summarized three subcodes from the original data that represent the most important aspects of students' competence: professional knowledge and skills, general skills, and attitude. As Frazer suggests, the quality of higher education primarily refers to the quality of student development, that is, what students "learn" throughout the learning process, including what they know, what they do, and their attitudes. The cognitive and skill gains they make are the core criteria for measuring the quality of higher education (Biggs, 1979; Suleman, 2018), even though they are too challenging to foster or complex to measure (Allee, 2000; Mavri et al., 2021). The following examples are the official wording used in several policy documents.

Deepen the teaching and learning reform, attach importance to the coordinated development of student's knowledge, skills, and qualities, focus on improving the learning skills, practical skills, and innovative skills of university students, and promote quality education in all aspects (MOE, 2005).

To actualize the merger of quality education and professional education, to expand the breadth and depth of knowledge students acquire, and to promote their creative thought. Enhance the development of student's communication skills, teamwork skills, critical thinking skills, information management skills, and capacity for lifelong learning. Strengthen the cultivation of quality competencies in both moral and medical sciences, as well as the students' sense of responsibility and honor in serving society (MOE, 2018f).

Emphasize the quality improvement of practical teaching and learning. Increase the proportion of practical training in agriculture-related subjects, change the old concept of "focusing on knowledge transfer rather than ability cultivation", and strive to improve students' professional practical skills, as well as cultivate compound applied agricultural and forestry talents who "know agriculture, love the countryside and respect peasants (MOE, 2020)."

As the needs of society are changing, the connotation of students' competence is thus

evolving. Through an in-depth analysis of the specific contents of the relevant policy texts, we have drawn four characteristics of the changing trend of the connotation:

1) The specific content of students' competence changes according to national demands and different specializations.

2) The goal of talent training is based on "moral, intellectual and physical," and the specific content of students' competence is around this route accordingly.

3) The emphasis on social responsibility, innovation, and practical ability is growing, and all-around development has become an important trend in students' competence development.

4) Students' competence to match ever-changing labor market requirements are underlined.

Especially in light of the epidemic, developing students' competence to face an unpredictable future is on the agenda. This dilemma of skill mismatch is not exclusive to China. It has become a severe social, economic, and even political concern worldwide (Clarke, 2018; Mok et al., 2021).

Table 14. The situation of subcodes' data sources and reference points within the main code "objective and mission"

Subcodes	Number of data sources	Reference points
The demand for well-rounded talents	42	47
Adapting to social changes and needs	36	38

Objective and mission. The finding indicates that the objectives and mission of students' competence development are to cultivate well-rounded students and adapt to social changes and demands (as Table 14 shown). According to the specifics of the paper, on the one hand, the Chinese government has aware that while the scale continues to expand, quality must be given more prominence, focusing on the cultivation of students with all-around development of moral, intellectual, physical, aesthetic and labor skills (e.g., MOE, 2005, 2007, 2017b). In this regard, China lays a strong focus on the personal, cultural, and moral elements to educate students for comprehensive development. In fact, the Chinese policy of the education for all-round development of students with an ideological purpose continued for a few decades. On the other hand, in order to be compatible with economic and social development, the development of students' competence should be occupational demand-oriented, practical competence-focused, and industry-university integration as a way to innovate talent development mechanisms (e.g., MOE, 2013, 2016, 2020).

However, the emphasis on competence development to meet the development needs of society seems to be just a superficial factor. Profoundly, when viewed from an international perspective, this national educational move toward competences-based education, can be viewed as a local response to the global imperative (Zhao, 2020). In other words, it is a government reaction to the "fear of falling behind" in the global competition in education. Driven by the global trend, the Chinese government is unable to overlook the importance of students' competence development, particularly those competences that are deemed to be crucial for the next generation to succeed in the 21st-century ever-changing world. Developing students' competence, in addition to being essential to individual success in life, is crucial for sustaining and enhancing the nation's competitiveness in the international arena (Chiang, 2013; Cinque, 2016; Loyalka et al., 2021). Realizing this, the Ministry of Education in China committed to integrating competence development into educational policies and strongly advocated it. However, incorporating

competence into the curriculum is challenging in practice. There are still many hurdles and obstacles to overcome (Wang, 2019).

Table 15. The situation of subcodes' data sources and reference points within the main code "means of promoting students' competence development"

Subcodes	Number of data sources	Reference points
Environment construction	10	34
Institutional support and assurance	32	72
Develop teaching faculty	31	43
Deepen teaching and learning reform	38	121
Enhance practical activities	29	50
Resource input and optimization	29	51

Means of promoting students' competence development. As indicated in Table 15, the Ministry of Education has issued a series of documents instrumental in guiding students' competence development at the national policy level. We have derived six subcodes within the source information, which are significant ways of developing students' competence, including environment building, institutional support and assurance, developing teaching faculty, deepening teaching and learning reform, enhancing practical activities, and resource input and optimization. Specific examples are presented in Table 12, and will not be repeated here.

Within these subcodes, teaching reform is referenced frequently. The reform consists mainly of teaching concepts, curricular systems, teaching methods, and evaluation and assessment methods, among other things. All the efforts are expected to make sense for students' competence development. For instance,

Guide teachers to change the education and teaching concept, support teachers conducting teaching and learning research, and encourage prestigious teachers to lecture undergraduate students (MOE, 2009a).

Optimize the curriculum system. The course content should be able to reflect new advances in the subject area, highlight the practicality and comprehensiveness of the curriculum, and enhance the connection between theory and practice (MOE, 2013, 2018f).

Strengthening bidirectional interaction between lecturers and students, directing students to independent thinking, active participation, and teamwork, and developing a student-centered teaching and learning model (MOE, 2015a).

Evaluation and assessment should be interwoven with teaching objectives, learning attitudes, and prior student knowledge. Regarding the method, it should blend summative evaluation with formative assessment. In terms of strategy, it is crucial to adopt both the closed-book theoretical written test and the assessment of practical and operational skills. As for evaluation subjects, teachers' evaluations of students, students' self-assessments, and peer reviews should be included (MOE, 2004, 2018f).

Overall, given that policies at the central government and Ministry of Education, universities are encouraged to put teaching and learning reform into practice, and embed students' competence development into one of their top priorities in agenda. Together with the ever-changing society, the grimness of employment, and the desirability of students, we may see how it is imperative to explore ways to better develop students' competence in various aspects. This is the focus and

endeavor of our study lie, which will be developed in detail in section 3.6 and the empirical part.

Disciplines. According to the data presented in Table 16, 33 of the total 57 materials are geared toward all disciplines, while the remaining materials are geared toward specific disciplines, including engineering, computer science, agronomy and forestry, physical education, medicine and public health, and musicology. Since these stressed fields tend to be application-focused, this shows that students' competence in China is not only disciplinary in character but also practical-based in nature. In contrast, students' competence in the humanities discipline requires to be given more attention. In addition, of these discipline-specific policies, those that refer to medicine and public health are the most numerous. This demonstrates that China places a high priority on the cultivation of medical students, which is tied to the country's societal demands, particularly during the pandemic time.

Table 16. The situation of subcodes' data sources and reference points within the main code "disciplines"

Subcodes	Number of data sources	Reference points
For all disciplines	33	33
Engineering	3	3
Computer science	1	1
Agronomy and Forestry	2	2
Physical education	1	1
Medicine and Public health	14	14
Musicology	1	1

Overall, based on the content of the policy text, we conclude several characteristics and trends in the development of students' competence in Chinese higher education over the years (1999–2022). First, regarding the concept, a formal and precise definition of students' competence cannot be found in official Ministry of Education policy publications. However, our findings from a relatively comprehensive policy analysis reveal that Chinese policies refer to three types of competence: professional knowledge and skill, generic skill, and attitude. In other words, the three elements are combined to form the term competence. Second, the particular connotation of students' competences varies with social development and according to their specialization. It is worth noting that the focus on social responsibility, innovation and practical skills has been growing, and all-round development has become an important trend in students' competence development in China. Third, in terms of objectives and missions, China's talent training has been consistently socialist in nature and direction, and thus so has the students' competence development. Upholding socialist interests and serving national needs are fundamental to China's educational policies and goals. And the educational policy of the Communist Party of China is necessary through the bridge of the competence system to be transformed into specific educational goals and concepts that are accessible to teaching and learning practice and perceptible to teachers and educators. Fourth, for nearly 20 years, China has been moving through a series of policy-oriented educational reforms to underscore the importance of students' competence development and vigorously push for it. However, putting policies into practice has been a slow burner, especially at the course level. Finally, rooted in China, the policies also place more weight on disciplines with strong practice-oriented. And the scope of students' competence development

is more confined to the macro level, and there is still considerable room for improvement in how it is implemented and how it is specific to disciplines and even subjects, as well as numerous obstacles. In the future, it is imperative to develop and position discipline-specific competences and to identify corresponding and appropriate ways of developing students' competence.

2.6 "In between" conclusion and discussion

In this chapter, we have provided an account of the context in terms of philosophy, concepts, and policies on both the student-centered approach and students' competence development in Europe and China. In order to fully understand the situation at the national level of the student-centered approach and competence development, the background information like the culture, organization of the education system, education reforms, and associated concerns of the two places are briefly illustrated and discussed. From the literature review and policy analysis, we can identify some commonalities and contrasts between them, which is worthy to explore more.

First, in terms of the philosophy and origin of student-centered approach, the distinctions between Eastern and Western countries regarding teaching and learning modalities are rooted in their respective historical and cultural origins. Education is associated with a particular economic foundation and superstructure. It implies that the disparities between authoritarian and democratic societies in the East and the West have indirectly influenced the teaching and learning paradigm. Besides, the change in educational philosophy and practices was driven by the demands of social advancement. Accordingly, the origin of the student-centered approach in Europe was spurred on by academic progress, such as progressive education, humanism theories, cognitive development, constructivist theories, and others. In China, on the other hand, although the Confucian educational philosophy shares certain parallels with some Western ideologies like constructivism, the student-centered approach is actually an import of Western origin. And there is one fundamental difference between them: traditionally, teaching and learning begin with the teacher in Eastern culture, who is placed at the center of the educational process. However, there is another crucial common reason for the rising interest in the student-centered approach in both European countries and China – the global expansion of higher education and significant changes in society and the labor market – causing concerns about the decline in higher education quality and the development in student's competence. Consequently, the student-centered approach and the development of students' competence are gradually gaining prominence in the higher education sector.

Second, with regard to the concept, there is no consensus regarding the definition of the student-centered approach, despite common features between the different interpretations. In Europe, many organizations and academics have expressed various understandings of the student-centered approach, and "a hundred schools of thought" have presented. There is also a wealth of related research, which has spawned many specific methods of teaching and learning from different definitions. In contrast, the concept of the student-centered approach has been less discussed in China, even though scholars are keen to examine innovative pedagogies. For this concept, it is inclined to take the views of particular prestigious experts as a reference and follow the perspectives. Given that no uniform answer exists, this study will adopt a meta-concept and attempt to find explanations from the voices of relevant stakeholders. The definition of students' competence will be discussed in detail in section 3.1.

Third, policy-wise, governments and organizations in both Europe and China have launched

many policies on the student-centered approach and the development of students' competence. This demonstrates the value placed on teaching and learning as well as on students' competence in both places. On the one hand, in Italy, within the Bologna Process, there is a clear link established between "student-centered, outcomes-based learning" and the National Qualifications Framework, learning outcomes and ECTs, and lifelong learning. Moreover, The Tuning project has developed methodologies and best practices for competence, which can be classified as subject-specific and generic. Specifically, Tuning constructs references for multiple disciplines. These are important for making the study programs of each cycle comparable, compatible, and transparent in the BP. On the other hand, Chinese policies tend to promote the implementation of the student-centered approach through various guidelines, such as institutional support, curriculum reform, teaching reform, revision of talent development objectives, and others, in order to enhance the quality of teaching and learning, and better develop students' competence. It is evident that substantial effort has been made to improve the quality of teaching and learning in both Europe and China. However, action speaks louder than words. There is considerable evidence indicating that they share the same dilemma: the decoupling of policy from practice. Therefore, translating policies into reality remains a challenge, particularly at the institutional level.

Beyond the contrasts mentioned above, on a deeper level, we found that there are more variations between Europe and China in their respective policies. First of all, student participation in the policy varies significantly. In EHEA, student participation was regarded as a significant value (Klemenčič, 2012). And the ESU played a crucial role in forming policies and practices governing student engagement. However, the initial stage of the BP was not very promising for the students' engagement (Bergan, 2004). ESU was not invited to participate in the drafting process of the Bologna declaration. It was the efforts and effective lobbying of the Italian students' union – Unione degli universitari – and the Executive Committee of ESU that changed the situation. After that, the increasing impact of student representatives in European higher education policy-making (Šušnjar & Hovhannisyan, 2020). It is visible that higher education in Italy places great importance on the student's voice. As opposed to the situation in Italy, hardly any students participate in policy-making in China. In this regard, compared with the western academic community or market-driven development logic, due to excessive bureaucracy and limited institutional autonomy, the bottom part of the Chinese higher education system seems not to have as much of the discourse, such as the students' perspective or other stakeholders' organization (Altbach, 2022). To truly implement the teaching and learning reform, China's policymakers must require fresh cognitions and actions.

Moreover, while national and supranational policies in both locations emphasize competence development, Europe is a step ahead in developing competence frameworks. In Europe, Tuning has carried out extensive research to construct competence frameworks for every cycle of study programs in various disciplines. By contrast, in 2013, the Chinese Ministry of Education initiated and funded research projects on China's core competence framework for the various stages of student development. Perhaps the most notable and ambitious research project is conducted by a Beijing Normal University team from 2013 to 2016. It is titled *A Research on the General Framework of Core-Competences of Students at the Stages of Basic Education and Higher Education*, which results in a competence framework titled *Developing Chinese Students' Core-Competences* (Project Team for Core-Competences, 2016). Three dimensions comprise this framework: Cultural Foundation, Autonomous Development, and Social Participation. In these

three domains, there are a total of six types of core competences, including humanistic attainment, scientific spirits, learning to learn, healthy lifestyle, responsibility, and practice with innovation. Each category of core competences contains three references for which a substantial number of indicators are presented (specifically, refer to Wang, 2019). In the meantime, the MOE makes significant efforts to configure competences in educational processes and integrate competences into the curriculum, with the expectation that this reform will produce educational "products" that are distinguished by core competences. Unlike the European Competence Framework, the Chinese framework is grounded in the basic principles of scientific, contemporary, and ethnicity, and is applicable to both elementary and higher education. The broad scope of application means that the details may not be in place, and implementing education at specific phases may present practical challenges. More notably, the unified discipline-based competence frameworks have not yet been developed in Chinese higher education, which should be worked on in the future.

With the underlying principle of ethnicity in the Chinese competence framework, combined with the deeper motivations for Chinese students' competence development policies mentioned above (section 2.3.3 objective and mission), we observe an additional fundamental difference: when it comes to competence-based student development, China tends to take the state as the starting point, whereas Europe prefers to view the student as the starting point. This reflects the fact that China, as a developing country, has always had a grand vision of accelerating development and catching up with the developed world, driving the government to repeatedly adopt several strategies aimed at improving the quality of teaching and learning and global competitiveness.

Overall, based on the unique context of Italy and China, we examine the philosophy, concept, policy, and related issues of the student-centered approach and students' competence development, respectively, while this is not the whole story. From the literature review and policy analysis, we can identify research gaps that warrant further investigation. Thus, a comprehensive understanding of these two concepts and their relationship in theory and practice needed to be combined with a wide range of studies and university practice in the concrete institutional context, which is the main research theme we will explore in the following chapters.

Chapter 3 Defining the factors: Promote students' competence development from the student-centered approach in teaching and learning

This chapter mainly focuses on the factors which promote students' competence development from the student-centered approach in the course. Prior to defining the elements, from theory to practice, the first two sections review and discuss the evolving concept of competence in higher education and how competence theory for designing student-centered courses, including theories and methods to construct learning outcomes, the learning activities aligned with the learning outcomes, competence-based assessment, the constructive alignment theory and providing several related systematic instructional design models. Finally, to identify the factors impacting students' competence development by implementing the student-centered approach more reliably, conducting a systematic review and analysis is required, thereby laying the groundwork for constructing the survey instrument.

3.1 The developing conceptions of the term competence in higher education

3.1.1 Historical evolution of the term competence

In recent years or even decades, education has shifted from teacher-centered to learner-centered in higher education (Dole et al., 2016). Meanwhile, the shift from content-centered to competence-centered curricula has also occurred (Wesselink et al., 2010). Globally, research and practice on competency-based instruction are being a topic of great concern (Bergsmann et al., 2015; Paek et al., 2021). Particularly in the EU, competency-based instruction in higher education has become a crucial mission and objective. Students are expected to improve their competences instead of spending time solely on the acquisition. In this context, the EHEA firmly promotes competence development and the ways to encourage it, to assure and maximize the efficacy and efficiency of institutional education. Accordingly, the concept of competence has been identified as the cornerstone of the success of the educational process (Hernández-López et al., 2016; Reiss, 2012). However, the transition to competence-based teaching and learning has been one of the main challenges confronting European and Chinese universities in last years, although it also represents a "magnificent opportunity for universities to embark on a reform process which will allow them to adapt to the current social reality, namely, knowledge society" (Fan, 2019; Montero Curiel, 2010; Nombo, 2022). Nowadays, numerous European and Chinese institutions are experiencing this transition process, in which students' competence development becomes the central axis for articulating the teaching-learning process. In looking at how to promote students' competence development, we first need to define competence, that is, what competence entails.

Competence has a long history dating back to ancient times. The etymological evolution of the term competence shows that the meaning derives from two different origins: Latin European and American. According to Zaggia (2008)'s research on the conceptual history of the term competence, as for the Latin European, the adjective *compétent* appears around 1240, derived from the Latin legal term competence, a participle of the verb *compete*, which means in the literal sense to tend towards the same point, while in a figurative sense to agree, to belong to. Hence the notion of a well-founded, competent, appropriate instance in a legal context. The original meaning, therefore, is almost entirely lost to date. In the latter year, around 1480, the neologism *compétence* appears, deriving from the Latin *competentia* (proportion, right relationship), which, a century later, acquires the meaning of ability due to knowledge and then, by metonymy, of a competent person. At the same time, the meaning of rivalry appears, competition from the Latin verb

compete. This meaning has also disappeared over time. By the 16 century, the term competence appeared to emerge with a definition similar to the current meaning, related to capable, thanks to its knowledge and experience, and gradually been 'established' in several languages (Mulder et al., 2009; Stoof et al., 2002).

As far as the American contribution is concerned, the term competence is derived from linguistics with the meaning of a set of provisions, abilities, and specific attitudes that allow those who speak a specific language to be mastered. Mastery is demonstrated in concrete situations (performance or performance), while competence results from abstracting data directly observable in practice (Geffroy & Tijou, 2002). It can be revealed that the current meaning, ultimately, preserves the articulation between skills and performance from the American roots and the notion of appropriate, mastered, and specific knowledge of a person of Latin-European origin.

Moreover, from a Chinese perspective, although students' competence is a relatively modern term, it has been embedded in lots of ideas for a long time. In particular, the term competence is highly relevant to talent development (Project Team for Core-Competences, 2016). The question of "what kind of students should be educated" has always been at the heart of discussions among educators and philosophers. Since more than two thousand years ago, the term competence in Eastern culture has gained the meaning of virtue, known as *Pin De* (品德) in Chinese (Mansilla & Wilson, 2020; Tan, 2019). Accordingly, the philosophy of talent cultivation is developed around virtue. In China, Confucius as the representative of the philosophers also early on thinking around sound personality, can be summarized as the "inner sage outside the king" view of talent development, that the most crucial aspect is the cultivation of virtue (Sun, 2013; Wang & King, 2008). For example, in order to foster students' filial piety, fraternity, loyalty, and trustworthiness, Zhu Xi, a renowned philosopher from the Southern Song Dynasty, advocated that education students from an early age must be "sprinkling into and out, etiquette, music, archery, books and mathematics to start (Hoobler & Hoobler, 2009; Xi, 2022)." In traditional Chinese teaching, methods and approaches for fostering talents, such as establishing aspiration, respecting the Lord, cultivating, reflecting, and practicing, were also emphasized (Yongli & Yiping, 2021).

Comparing the ancient period in the West, similar ideas were actually mentioned. Socrates taught students to strive to become virtuous. "virtue is knowledge" is the most crucial tenet of Socratic (Gulley, 2013). Later, both Plato and Aristotle, as well as the Roman philosopher Cicero, proposed several major virtues that citizens must possess (commit virtue), such as justice, wisdom, courage, and knowledge of moderation, thus constituting civic qualities under classical theory (O'Meara, 2003). Meanwhile, Aristotle also desired that the city-state's residents possess a spirit of civic participation (Dagger, 2013). Thus, both in the East and in the West, the ancient conventional criteria for talent include high virtue character as the priority. These qualities reflect the philosophers' understanding of competence and talent cultivation. In short, before the advent of the industrial revolution, competence in the Chinese context tended to have more connotations of virtue.

With the industrial revolution and the coming of the industrial society, there was a general increase in focusing on specialized skills and valuing the talent's competence, both of which are demand-driven. Particularly at the end of the 60s, personal competence was considered an important part of personal dispositions, which are seen as the result of professional skills, acquired knowledge, and professional experience (Waterman, 1990). Moreover, since the mid-70s, multiple factors have forced companies to change their operating model to remain competitive, leading to

employees moving from a logic of the place, based on a prescribed job, to a logic of competence, which leaves room for autonomy and initiative of the worker (Taylor & Bisson, 2020). As a result, in the 20th century, competence has been used in various workplaces.

Accordingly, researchers of different disciplinary orientations reflected and analyzed the conceptual content of competence in a new and more prosperous way. For example, in Europe, the concept of competence has entered professional literature in law (competence of courts and witnesses), public administration (competence of institutions), organizational structure (competence of departments or functions), management (core competence, competence management), and education and training (competence-based education) from the seventies of the last century (Mulder, 2007; Silva et al., 2018). Although the term competence has been controversial, there are milestones in its usage in history, as the list below shows (Mulder et al., 2009):

a) Use in daily speech: Persian – Greek – Roman eras;
b) Used in Western languages: Sixteenth century;
c) Used in behavioral sciences: 1950s White (1959);
d) Used in systems science: 1970s Gilbert (1978);
e) Used in management sciences: 1980s Boyatzis (1982);
f) Used in corporate strategy: 1990s Prahalad and Hamel (1990);
g) Institutionalized in education: 2000s European Commission (2005).

Obviously, in the 20th century, there were several conversations regarding the concept in a number of different domains and dimensions. In behavior sciences, White (1959) identified competence as a fundamental motivation for acquiring knowledge, mastery of skills, and exploration, or competence as exploratory learning for "effectance." Within the field of systems science, Gilbert (1978) drew a connection between competence and successful performance enhancement. Meanwhile, In the 1970s, academics began associating competence with the education field. McClelland (1973) argued that traditional tests must be updated since IQ tests and standard assessments have limited predictive validity in education, training, and the selection of professionals. Subsequently, Zemke (1982) broadened the notion of competence to encompass all facets of training and development. Moreover, professional organizations began including competency in licensing and registration procedures. In the 1980s, competence was also used in management sciences. Boyatzis (1982) requested that top-performing managers outline their competences. Similarly, in the 1990s, Prahalad and Hamel (1990) suggested that companies that identified and utilized their core competence in strategic development demonstrated outstanding success.

Along this line, the concept of competence has gained popularity in European education. In higher education, the notion of competence has garnered significant attention. The European organizations' understanding of competence and efforts were elaborated in detail in section 2.4. Thus it will not be repeated here. However, many studies revealed that the implementation of competence-based education in different nations might face various difficulties and challenges (Biemans et al., 2004; Davis, 2017; Holmes et al., 2021; Tahirsylaj & Fazliu, 2021). In this contribution, competence is viewed as a sequence of integrated capabilities comprised of clusters of knowledge, skills, and attitudes that are necessary for task performance and problem-solving and for functioning effectively in a particular profession, organization, job, role, and scenario (Mulder et al., 2009; Rodolfa et al., 2005; Römgens et al., 2020; Sáez-López et al., 2021).

Overall, from reviewing the evolution of the term competence, it is possible to conclude that all of these implications of competence in the 20th century are performance- and career-oriented. Moreover, the scope of competence to be developed is widened over time. However, due to the demands of industrial society, the understanding of competence-based talent development remained predominantly at the level of intelligence, failing to adequately account for the emotional, attitude, and value dimensions essential for all-around personal growth, in both the East and West (Trow, 1973; Xin et al., 2016). With the acceleration of globalization in the 21st century, the traditional notions of competence, such as a single dimension of ability, skill, or literacy, are no longer sufficient to meet the diverse needs of the complex and rapidly changing information era. The concept of competence has been enlarged and integrated, resulting in a "new" application of the concept of competence. It is novel in that it has shifted from a fragmented approach to improving behavior-oriented skills to a more integrated approach of developing clusters of interrelated knowledge, skills, and attitudes pertinent to entry into a field of study and employment (Edwards-Schachter et al., 2015; Mulder et al., 2009; Maderer & Gütl, 2021).

3.1.2 The different definitions of students' competence development
There is a multitude of definitions of the concept of competence at various levels of education. Researchers or organizations interpreted the concept of competence differently. The debate has been ongoing about its conceptualization. In recent years, the definition of competence has been divided into the following perspectives.

First, competence is considered as a cluster of knowledge, skills and attitudes (e.g., Baartman & De Bruijn, 2011; Brundiers et al., 2020; Spencer & Spencer, 1993), and the mix of which can vary with each competence (Van der Klink et al., 2007). Moreover, the balance of knowledge, skills, and attitudes must also be considered. In this sense, competence extends beyond knowledge and skills, contributing to preparing students to live in a global world and empowering them professionally (Pinto, 2018). Both European Union and China have promoted this idea (European Union, 2006; Xin et al., 2016).
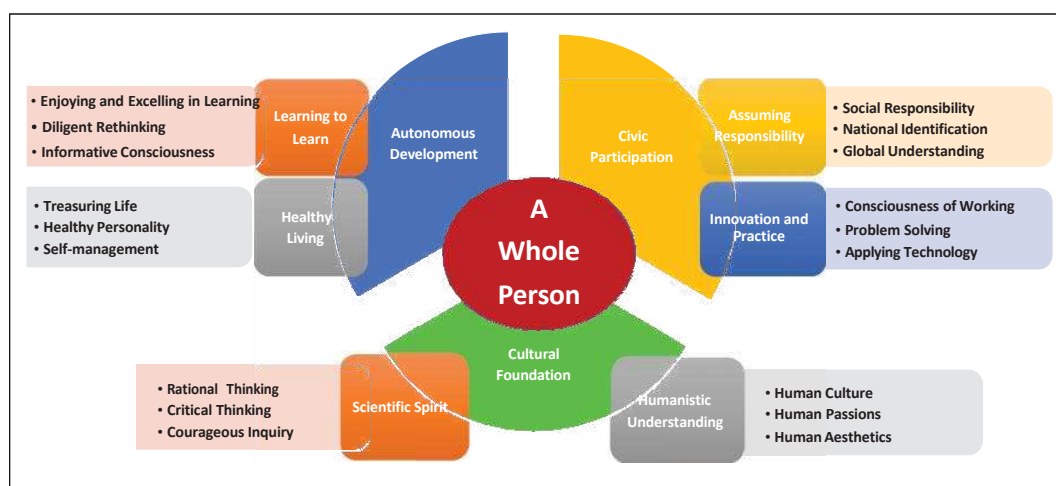
Figure 3. China's core competencies framework (Project Team for Core-Competences, 2016; Wang, 2019).

China's framework for core competencies consists of three "dimensions," six "modules," and

18 "items." As depicted in Figure 3, there are three dimensions of autonomous development, civic participation, and cultural foundation, as well as six modules: learning to learn, healthy living, assuming responsibility, innovation and practice, humanistic understanding, and scientific spirit, that contribute to the development of the whole person. This framework embodies the idea of emphasizing the overall development of students' competence in China. Although the framework does not explicitly address knowledge, skills and attitudes, its three dimensions (each with two modules) inherently contain and correspond to these three meanings. Specifically, for instance, the "learning to learn" module entails the idea of knowledge. The "healthy living" and "innovation and practice" modules typically refer to skills. In addition to representing attitudes, the specific items of module "scientific spirit" reveal the shades of skills. The remaining modules reflect attitudes.

Second, competence is a way of describing intended learning outcomes. In a peculiar sense, competencies can be formulated as concrete learning outcomes and, described in a profile, included in courses via innovative educational methods (European Commission, 2014; Fernández et al., 2022). Moreover, in the context of the EHEA, competence can be regarded as an adaptable behavioral potential to a given situation (De Miguel Díaz, 2006; Hernández-López et al., 2016). Students alter their behavior by gaining knowledge and skills that allow them to do something with it. In other words, they develop a set of competence. However, academics also emphasize that students must have assimilated the knowledge before changing their behavior (Guardia et al., 2019). Furthermore, several authors contend that the educational environment is now broader, in which students should be able to manage knowledge, update it, and decide what is appropriate for any given situation (e.g., Fernández et al., 2010; Muluk et al., 2019). Therefore, each learning outcome includes knowledge and skills that the student is expected to master and apply in a setting distinct from the learning context (Gonzalez & Wagenaar, 2003; Viberg et al., 2018). According to Botma et al. (2015), the discussion on learning outcomes "has switched from content to competence" based on constructivist approaches to learning and experiential learning theory.

Moreover, this kind of perspective is also reflected and advocated in the Tuning project. Tuning was novel and the first to integrate the notions of competences and learning outcomes (1) by suggesting that level of competence should be described in terms of the learning outcomes statement and vice versa and (2) by tying both terms to the definition of the subject area profiles (Tuning, 2003). In the Tuning project, emphasis was placed on the expanding role of generic or transferable skills (subdivided into instrumental, interpersonal, and systemic skills) in the dynamic society of the 21st century, in addition to subject area competences. Per the viewpoint of Tuning, these sorts of competence should also be cultivated in tight alignment with a body of knowledge, or subject matter. This is a crucial point to note. It says, "by learning outcomes, we mean the set of competences including knowledge, understanding, and skills a learner is expected to know/understand/demonstrate after completion of a process of learning – short or long" (Tuning, 2003). However, in this sense, competence is complicated, encompassing not only knowledge, skills, and attitudes, but also experience, values, and dispositions that a person who has engaged in educational processes and practices has gained (Holdsworth & Thomas, 2021; Hutmacher, 1997; Mezirow, 1997; Wagenaar, 2014). Thus, in addition to the personal dimension, the social dimension of competence has also been underlined.

Third, the emphasis on competence assessment in recent years has motivated many researchers to define competence from an evaluation and assessment standpoint. All along, the

definition of competence ranged from very broad to extremely detailed, and there is no consensus, leading to difficulty in evaluating competence. From an evaluation perspective, competence should be defined considering the levels of abstract and its feasibility criteria (American Library Association, 2000; Bergsmann et al., 2015).

On the one hand, evaluation results of competence should meet the information needs of the intended users, such as the vice rectorate for study affairs, the senate, teachers, and students (Bergsmann et al., 2015; Fabrice, 2010). In this regard, competence should not be defined at a very high level of abstraction, as this could prevent concrete actions for improvement. Thus, competence should be expressed at a medium level of abstraction (Mulder et al., 2009; Overberg et al., 2019). To be more explicit, table 17 presents an illustration of different levels of abstraction in the context of tertiary teacher education. It infers that competence is defined specifically to the subject field, but on a more abstract degree than learning outcomes.

On the other hand, different conceptions of competence require varied inclusion of components (Miranda et al., 2021; Weinert, 1999; Zlatkin-Troitschanskaia et al., 2015). Nevertheless, many definitions of competence hold at least two elements: knowledge and skill (e.g., Ananiadou & Claro, 2009; Huang, 2021; Organization for Economic Co-operation & Development, 2014). In this sense, the definition of competence should distinguish between knowledge and skill.

Table 17. Degree of abstraction in defining competences (refer to Bergsmann et al., 2015)

Degree of abstraction	Example
High (not context- and domain-specific)	Ability to present comprehensive information of competence
Medium (context- and domain-specific)	Ability to present the tools of assessment of competence
Low (context- and domain-specific learning outcomes)	Ability to present the French methodology "bilan de competences"

Note. Degrees of abstraction in defining competences using the example of science education.

Synthesizing the connotation of the three types of competence concepts mentioned above and taking into account the different disciplinary perspectives on competence, we can draw three characteristics of competence (Van der Klink et al., 2007):

• *Integrativity*: competence is a coherent collection of components necessary for problem-solving;

• *Sustainability*: a hallmark of competence is that it is relatively stable (over time), while its substance (such as knowledge and skills) changes over time;

• *Specificity*: competences differ in the degree to which they are context-bound. Some, such as learning competences, are widely applicable, whereas others are more bound to specific contexts, including vocational.

Overall, given that there is currently no consensus over the definition of competence, we shall integrate the perspectives and define *students' competence* as a collection of knowledge, skills, and attitudes acquired during the learning process. It is process-oriented as opposed to results-oriented. In the context of the particular subject, competence is also described by the intended learning outcomes, which primarily encompass professional knowledge and skills.

Besides professional skills, generic skills have become increasingly important in an ever-changing society. Thus, in this study, students' competence refers to the combination of learning outcomes, generic skills, and attitudes, helping students adapt to the future society, promoting lifelong learning, and achieving holistic development.

3.1.3 International consensus and trend on the definition of students' competence development

Currently, worldwide organizations and nations have initiated a wave of educational reforms oriented toward developing students' competence. A summary of the international consensus on the definition of competence might aid comprehension of the concept's nature and evolution. The following commons and trends can be identified by examining the meaning of the idea of competence across international organizations and countries as examples (see Table 18).

Table 18. Definition of competence by international organizations/countries

International organizations / Countries	Definition of competence
Organization for Economic Co-operation and Development (OECD)	Competence is more than just knowledge and skills. It involves the ability to meet complex demands, by drawing on and mobilizing psychosocial resources (including skills, attitudes and values) in a particular context (Rychen & Salganik, 2001).
	To tackle the complex difficulties of today's world, individuals require a broad range of competences. In addition to emphasizing those competences that apply only to a certain profession, occupation, or walk of life, transversal competences are highlighted (OECD, 2022).
United Nations Educational, Scientific and Cultural Organization (UNESCO)	The proven or demonstrated individual capacity to use know-how, skills, qualifications or knowledge in order to meet the usual, and changing, occupational situations and requirements (UNESCO, 1984). The application of knowledge and skills in context is described using learning outcomes (Keevy & Chakroun, 2015).
	Emphasis on digital, employment, sustainability, and global competence. The pandemic significantly increased the digital transmission of knowledge, making digital competencies crucial for participation in society, including lifelong learning and employment opportunities (UNESCO, 2022).
European Union (EU)	A competence is defined as the interlinked set of knowledge, skills and attitudes appropriate to the context, and to apply them in a variety of situations (European Commission, 2016).
	There is growing consensus on the new prominent place of the notions of competences in relation to: a) the development of human capabilities in general; b) skills intelligence; c) matching supply and demand in the labor market (European Union, 2021).
The United States	To become globally competent citizens, university students should acquire a set of knowledge, skills and attitudes upon graduation (American Association of State Colleges and Universities, 2012).
	Competence is a measurable pattern of knowledge, skills, abilities, behaviors,

	and other characteristics that an individual needs to perform work roles or occupational functions successfully (U.S. Office of Personnel Management, 2022).
Australia	The consistent application of knowledge and skill to the standard of performance required in the workplace. It embodies the ability to transfer and apply skills and knowledge to new situations and environments (National Centre for Vocational Education Research, 2020).
Canada	Competence is any observable and/or measurable knowledge, skill, ability or behavior that contributes to successful job performance (Government of Canada, 2020).
Italy	The definition of the competences to be ascertained at the end of the study programs and of the courses was included among the minimum requirements, which is necessary for the establishment and activation of university training courses (Italian Ministerial Decree, 2007).
	Italy has officially adopted the definitions of competence given by the EU Commission in the context of the European Qualifications Framework (ISFOL, 2014). Competence means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. Competence is described in terms of responsibility and autonomy.
China	The key competences of Chinese students refer to focusing on the "all-round development of human beings" with three dimensions: cultural foundation, independent development, and social participation, and six modules: learning to learn, healthy living, assuming responsibility, innovation and practice, humanistic understanding, and scientific spirit, adapting to the needs of lifelong learning and social development (Project Team for Core-Competences, 2016).
France	The French model of competence posits that an individual's vocational competence is inextricably linked to knowledge (savoir), skills (savoir-faire), and attitude (savoir-être). Competence is a dynamic learning process, including the accumulation and transmission of knowledge, and it is the basis for lifelong learning (Durand, 2015).
British	Competence is the ability to integrate and apply contextually-appropriate knowledge, skills and psychosocial factors (e.g., beliefs, attitudes, values and motivations) to consistently perform successfully within a specified domain (Vitello et al., 2021).

First of all, in recent years, the notion of competence has permeated throughout the educational landscape, and the focus on competence has grown as it has been the focal point of international discussions on learning, curricula, and evaluation in general education (European Commission, 2019). This is due to the fact that developing competence is one of the primary objectives of education, with benefits not just for students but also valued for the economy and society as a whole. A person competent in a realm can apply the domain's torso of knowledge and skills to accomplish tasks and goals beyond the scope of the educational or training program. Thus, competence is a multi-functional concept. Competent individuals contribute positively to the

workplace and their personal lives. It implies that the development of competence is not solely the consequence of individual effort, but also requires a favorable social and ecological setting. The formation process of competence is a gradual process of synergy between individuals and society.

Second, competence is likewise a multidimensional concept. Although different organizations and countries differ in the specific expression of "competence," which reflects their distinct cultures and economic development needs, there is a commonality of ideas. Competence is a set of knowledge, skills, and attitudes that are comprehensive and integrated in nature and cannot be developed in isolation, especially when competence is described by learning outcomes. Moreover, it is emphasized that the acquisition of competence is a continuous and lifelong learning process.

Third, the concept of competence is evolving. The specific connotation of students' competences varies with social development. Notably, the focus on digital literacy (Zhao et al., 2021), employability skills (Abelha et al., 2020; Römgens et al., 2020), transfer skills (Kenayathulla et al., 2019), and sustainability (Brundiers et al., 2021) have become a significant trend in higher education of students' competence development. This is consistent with the direction of the results of the above policy analysis.

Last but not least, each coin has two sides. The term competence developed during the most recent two decades into a more holistic or encompassing meaning covering all learning elements. However, in the ongoing discourse among educational academics, some dismiss the term as "fuzzy and conceptually confusing." For example, the general definition of competence used in Europe in numerous policy documents, such as the EQF and the ECTs, is criticized as excessively wide and abstract (e.g., Brunello & Wruuck, 2021; Winterton et al., 2006). As such, competence is only meaningful in a particular situation and when adequately articulated. Furthermore, the use of competence has been easily misinterpreted or confused with other related words, but none can be equated with competence. For instance, students' competence development can be analyzed from the perspective of knowledge transfer, but always keep in mind that competence development cannot be reduced to factual knowledge or routines; to be competent is not always synonymous with being knowledgeable or cultivated (Casanovas et al., 2021; Hernández-López et al., 2016; Wagenaar, 2014). In practice, even if the concept of competence has arrived on the scene in its full grandeur, teaching by competence remains challenging.

3.2 "Competence theory" for the student-centered courses: From theory to practice
In an information-based society, specialized knowledge quickly becomes obsolete; therefore, university education must equip students with the skills and capabilities to acquire knowledge independently and manage uncertainty. In this context, it is less important to impart solely content-based knowledge, whereas the increasing emphasis is placed on imparting competences. Formats in a student-centered approach, such as the flipped classroom, inquiry-based learning, and others, are regarded as particularly suited for developing competences. Higher education institutions are transitioning from content-based to competence-based curricula in this regard. Competence-based learning is a student-centered, outcome-based approach to instruction in which students graduate to better work upon mastery of the necessary prerequisite knowledge and skills (Açikgöz & Babadogan, 2021; Henri et al., 2017). Some scholars even point out that student-centered, outcome-based, and competency-based learning are interchangeable (e.g., Sistermans, 2020). Three factors emerged as pivotal for the efficacy and effectiveness of the

process of aligning students' competence development in the student-centered course design – developing measurable and attainable learning outcomes, selecting appropriate teaching and learning activities, and the assessment tools (Jaiswal, 2019; Reynolds & Kearn, 2017). We will discuss each of them in conjunction with empirical studies.

3.2.1 Aligning course learning outcomes with learning taxonomies

Before describing the taxonomies, it is important to clarify the relationship between competence and learning outcomes, a crucial issue toward competence development. As earlier noted, there is diversity in the literature about interpretations of the term competence. This interpretation extends from a description of competence regarding performance and skills acquired by training to a broad overarching view covering knowledge, understanding, skills, abilities, and attitudes (Wagenaar, 2014). Due to a lack of clarity on the definition of competence, assessing and measuring competence can be very difficult. In contrast, the term learning outcomes is precisely defined in the literature. The learning outcome is a very specific statement that describes exactly what a student can do in some measurable way (Hartel & Foegeding, 2004). A competence may have several specific learning outcomes. As Kennedy et al. (2009) recommended, if the term competence is being used, the definition of competence used in a particular context should be stated, and competence should be written using the vocabulary of learning outcomes.

In this sense, competence is described in learning outcomes, which are defined as a written statement, incorporated in courses through innovative teaching approaches and expressing what a successful student should be able to achieve upon completion of a course (Adam, 2004). The subject matter substance of learning outcomes is articulated by a noun or noun phrase, whereas cognitive processes are described by a verb or verb phrase (Krathwohl & Anderson, 2009). The subject matter content is referred to holistically as the knowledge dimension and is divided into four major groups, namely, factual, conceptual, procedural, and metacognitive (Pintrich, 2002; Rao, 2020). Metacognitive knowledge is what teachers and students strive for in their teaching, learning, and mastery of course content, whereas factual knowledge is at the lower end of the scale. Moreover, learning outcomes are an essential component of the course syllabus, since they help students and instructors understand the course's objectives (Stanny et al., 2015).

How to develop learning outcomes is not a novel issue of discussion. Several theoretical perspectives and taxonomies characterize the transmission, reception, and processing of knowledge during the learning process. In other words, learning outcomes are commonly articulated using taxonomies (e.g., Fink, 2013, Gottipati & Shankararaman, 2018, as shown in table 19 and figure 4), with the two prevalent being Bloom's revised Taxonomy (Krathwohl, 2002) and Bigg's SOLO taxonomy (Biggs & Collis, 1982; Biggs & Tang, 2007), as presented in Table 20 and 21 respectively. Besides, they articulate and provide assessment guidelines and reflect the depth of learning and knowledge acquisition in a course.

The downside of the traditional course is that it focuses mainly on lower-order skills, overlooks higher-order thinking, and is thus not conducive to developing students' competence. In Bloom's revised taxonomy and SOLO taxonomy, there are several hierarchical levels of understanding, described in terms of verbs, that express an increasing order of cognitive complexity. Both groups of various action verbs into different learning levels that can be measured, were chosen to depict different learning levels. These proceed from the simplest level, as the lower-order thinking skills, where knowledge is recalled, to the level where more than one

idea is understood concurrently, to the higher-order thinking level, where associations between different ideas take place, and ultimately, to the highest order thinking level of generalization, invention, hypothesis, synthesis, theorization, and reflection (Biggs & Tang, 2007; Anderson et al., 2001). As a caveat, higher-order skills must be grounded in lower-order skills, which must be developed in the direction of higher-order skills. Therefore, when devising learning outcomes, teachers should lay them out comprehensively so that the intended learning outcomes for each level type mutually support one another and develop in a balanced manner.

In addition, SOLO taxonomy can be utilized not only in constructing the lever of intended learning outcomes, but also in terms of assessment, which aids in implementing the constructive alignment. We will discuss it in section 3.2.4. Therefore, to explain and analyze the learning outcomes in our cases, SOLO taxonomy, along with Bloom's revised taxonomy, and constructivist alignment, were chosen as this study's theoretical pillars.

Table 19. Finks taxonomy of significant learning (Fink, 2013)

Categories	Definition	Actions
Foundational Knowledge	Recall and demonstrate understanding of information and ideas.	Remember, recall, identify, explain, predict, describe, define, summarize, recognize, arrange, indicate, classify
Application	Demonstrate skills. Engage in critical, practical and creative thinking.	Use, critique, manage, solve, assess, judge, do (skill), imagine, analyze, calculate, coordinate, communicate
Integration	Perceive connections between ideas, experiences, disciplines and realms of life.	Connect, identify the interaction between, relate, compare, contrast, integrate, identify the similarities between, determine the cause
Human Dimension	Gaining a new understanding of themselves and others. Determine personal and social implications.	Interact with others, compare viewpoints, discuss (world events), identify the impact, plan (a change), determine (why actions occurred), advocate, collaborate, support, resolve, share
Caring	Acquire new interests, feeling or values about what they are learning.	Get excited about, prepare to, increase interest, value, reflect, change, adjust (beliefs), commit, develop (a plan), explore, express, pledge
Learning How to Learn	Learning about the process of their particular learning and learning in general.	Develop (a plan), identify resources, construct knowledge about, frame useful questions, analyze, inquire, reflect, research, self-assess, self-monitor
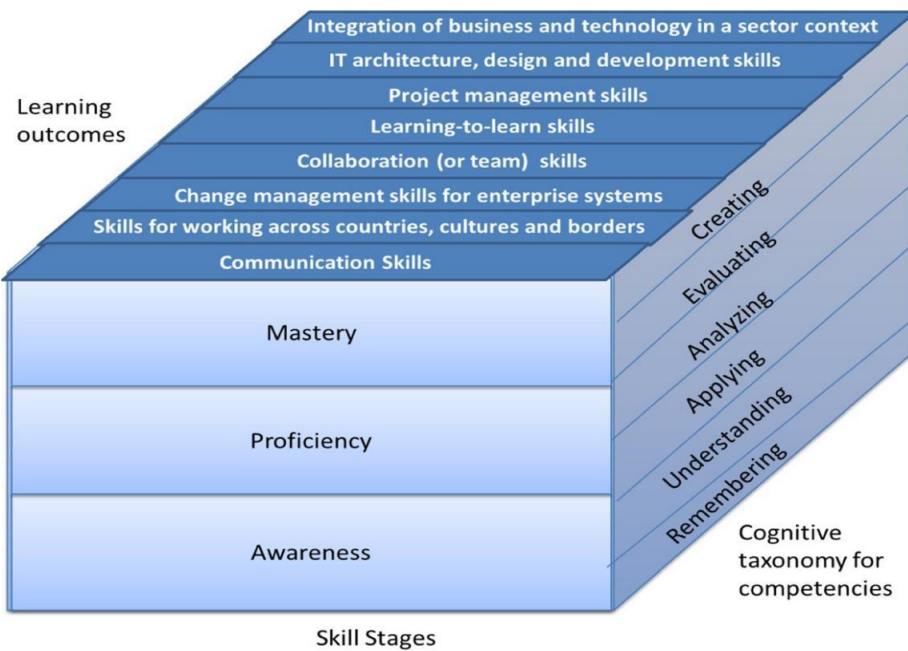
Figure 4. Competence cube – an integrated model of learning outcomes, modified Bloom's taxonomy and Dreyfus' skill development model (Gottipati & Shankararaman, 2018)

Table 20. Some verbs for intended learning outcomes from Bloom's revised taxonomy (Anderson & Krathwohl, 2001; Krathwohl, 2002)

Bloom's revised taxonomy levels	Definition	Intended learning outcomes verbs
Remembering	Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.	Define, describe, draw, find, label, identify, list, match, recall, recite, tell, write, name
Understanding	Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving, descriptions, and stating main ideas.	Classify, compare, exemplify, conclude, demonstrate, discuss, explain, illustrate, interpret, paraphrase, predict, outline, report, translate, summarize
Applying	Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	Apply, change, choose, compute, construct, develop, dramatize, experiment with, implement, interview, organize, plan, prepare, produce, role, play, show, transfer, use
Analyzing	Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	Analyze, assume, categorize, characterize, compare, contrast, debate, deconstruct, deduce, differentiate, discover, discriminate, distinguish, examine, function, inference, prepare, relate, research, review, structure, test

		for, theme
Evaluating	Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	Appraise, argue, assess, choose, conclude, criteria, critique, decide, deduct, defend, determine, evaluate, explain, importance, influence, interpret, judge, justify, mark, measure, opinion, predict, perceive, prove, rate, recommend, support, value
Creating	Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	Adapt, combine, compile, compose, construct, design, create, elaborate, estimate, formulate, imagine, improve, invent, make up, maximize, minimize, plan, perform, propose, solve, theory

Table 21. Some verbs for intended learning outcomes from the SOLO taxonomy (Biggs & Tang, 2007)

SOLO taxonomy levels	Intended learning outcomes verbs
Unistructural	Memorize, identify, recognize, count, define, draw, find, label, match, name, quote, recall, recite, order, tell, write, imitate
Multistructural	Classify, describe, list, report, discuss, illustrate, select, narrate, compute, sequence, outline, separate
Relational	Apply, integrate, analyze, explain, predict, conclude, summarize (précis), review, argue, transfer, make a plan, characterize, compare, contrast, differentiate, organize, debate, make a case, construct, review and rewrite, examine, translate, paraphrase, solve a problem
Extended abstract	Theorize, hypothesize, generalize, reflect, generate, create, compose, invent, originate, prove from first principles, make an original case, solve from first principles

Although learning outcome theories have been developed for decades and course syllabi have existed for more than a century (Parkes & Harris, 2002), their implementation, in practice, is less desirable, especially the learning outcomes. On the one hand, the quality of learning outcomes is not ideal. Several studies have examined the implementation related to the learning outcomes. For example, Schoepp (2019) conducted an exploratory study employing content analysis of ten of the world's leading teaching universities' publicly accessible syllabi. The results suggested that the quality of learning outcomes is considerably poor, and a substantial amount of effort was necessary to ensure that the learning outcomes were aligned with internationally recognized best practices in an acceptable manner. Several academics indicated that while most of the scrutinized course syllabi included learning outcomes, they were written and assessed at the lower levels of Bloom's taxonomy and knowledge dimension (e.g., Karanja & Malone, 2020). Hence, there is a debate that university teachers may have been aware of or even knowledgeable about the typologies of learning outcomes theories, but that these theories had limited to no impact on the

teaching and learning process (Stewart, 2021; Wagenaar, 2014). In other words, championing educational theory and methodologies created by experts may not or be difficult to affect the actual design and implementation of educational programs.

On the other hand, research showed that some faculty members are still primarily knowledge transmitters, which contradicts the notion of learning outcomes, which is student-centered (Nasrallah, 2014). These teachers are unfamiliar with the teaching-learning theories and the various pedagogical tools that can make learning productive (Biggs et al., 2022; Khalaf & Mohammed, 2018). Since adopting the EQF, most European nations have made substantial progress in implementing the learning outcomes approach in all subsystems of education (Gaebel et al., 2018). This development has also affected teacher education. The move to the learning outcomes approach has altered the design and delivery of curricula in numerous institutions. However, there are the challenges remaining, such as uneven progress among the countries and institutions, leading to bureaucratizing without appropriate implementation (Halász, 2017). In China, over the past decade, there has been a shift in science, technology, engineering, and medical education towards a competence-based and learning outcomes approach (e.g., Wang et al., 2020; Zhu et al., 2018). However, this process is not evident in other disciplinary areas. We could discover that teaching objectives are typically utilized rather than learning outcomes (e.g., Liu et al., 2019), which implies that the starting point is teacher-centered. Moreover, based on the researcher's experiences as a Chinese student, the syllabi and learning outcomes do not form an open document, resulting in a limited role in evaluating students' learning process.

In recap, a closer observation of learning outcomes uncovers that they are regarded as tools for shifting the emphasis of higher education toward the student-centered approach. Supposedly, this is achieved through constructive alignment. Specifically, in some instances, learning outcomes have the potential to provide students with extensive learning experiences when utilized in constructivist contexts, such as student-centered courses (Jaiswal & Al-Hattami, 2020; Scicluna et al., 2012). However, when students were exposed to conventional teacher-centered contexts, these identical outcomes did not meet their desired effects (Akramy, 2021; Serin, 2018). According to Halász (2017), although there are numerous policies on learning outcomes, competence, and student-centered approach, macro-level rules and regs or declared institutional-level policies do not result in actual implementation unless substantial changes in the daily behavior of individuals and institutions accompany them. Therefore, in such uncertain circumstances, specific empirical studies have attempted to depict what is really happening in Italy and China's higher education institutions, and this is what this multiple case study is meant to achieve.

3.2.2 Integrating the learning activities in line with competences in student-centered course

Even the notion of learning activity has developed in the present teaching and learning paradigm. Learning activities are no longer merely "teacher-led instructional tasks," but they have a greater correlation with student engagement and achievement (Howe et al., 2019; Zainuddin, 2018). By way of illustration, Harris et al. (2009) regarded learning activities as an instrument for getting knowledge in a functional and practical way. Similarly, other scholars identified learning activities as the work performed by a student to construct a learning process, which is increasingly associated with skills acquisition (e.g., Bayanova et al., 2019; Hadiyanto et al., 2021). In addition, the fever and rise of competence-based and student-centered learning in organizations and

institutions have impacted the learning activities in course design.

The connection between the competence-based approach and student-centered approach is close. The competence-based approach is a means to make learning student-centered. The competence-based approach can be broadly defined as a pedagogical approach that emphasizes the mastery of measurable student outcomes (Albanese et al., 2008; Bagnall & Hodge, 2017). The student-centered approach is an educational philosophy that focuses on satisfying each student's individual requirements. One of the four core tenets of the student-centered learning environment is the establishment of competence-based learning progressions—students' academic advancement based on the demonstration of mastery or competence of predefined standards (Glowa & Goodell, 2016). Thus, the competence-based approach is a component of the student-centered approach; it is a specific and profound change rooted in a system designed to support student mastery and success.

There are numerous reasons and evidence why competence-based learning is an effective pedagogy, including reducing retention and improving recruitment (Koenen et al., 2015), meeting students' diverse needs (Henri et al., 2017; Palma-Mendoza et al., 2021), more positive student attitudes regarding the courses (Granados & Jaramillo, 2019), increasing student knowledge (Mihnev et al., 2021), developing transfer skills (Williams, 2019), and adapt to market competition and industry demand (Makulova et al., 2015), and others. Academics agree that the competence-based approach is beneficial, particularly in interdisciplinary fields, since they are student-centered and possibly contributes to students becoming more autonomous and intrinsically motivated (Misbah et al., 2022; Spelt et al., 2015). In other words, the competence-based approach often goes together with implementing principles of activating student learning. In this sense, the activities designed to promote students' competence development coexisted with student-centered classroom practices, and each of these activities characterizes what teacher's envision of students' overall engagement. The specific methods of the student-centered approach are already described in detail in section 2.3. However, how the pedagogical design differs with the addition of competence theory, the focus is on aligning learning outcomes with activities.

In the design process of the course, it is crucial to explicitly identify possible learning questions (intended learning outcomes) corresponding with a specific core problem before developing concrete learning activities (Guerrero-Roldán & Noguera, 2018). This means that instructional designers take probable student learning questions as the starting point, and translate them into desired learning outcomes (in the preparation phase). Otherwise, the design process risks becoming too instrumental and fragmenting learning. In this step, it is vital to view through the student's eyes and not solely through the lens of a discipline. When the educational designer adopts the student's perspective, he or she will develop meaningful activities that mimic authentic practice. In the actual learning process, students are able to respond to the questions and achieve the desired learning outcomes through activities, reflecting some form of self-directedness.

Moreover, the learning activities should be grouped in personalized, authentic, and interactional learning environments (Wesselink et al., 2017), considering the competence constructed. There are many innovative pedagogical strategies to develop competence, varying degrees of applicability in each discipline. As shown in Table 22, various activities are likely to elicit the student's competence. The activities can be directed by the teacher, such as lectures, seminars, and workshops, particularly suitable for dealing with the content of a topic in-depth, directed by peers – including group work, peer teaching, spontaneous collaboration, and others,

helpful in elaborating understanding, solving problems and providing different points of view and perspectives, or self-directed – such as study and learning, cognitive outcomes, important for developing in-depth competence, as well as self-learning, monitoring, and self-assessment skills.

Table 22. What activities are teaching methods most likely to elicit? (Biggs, 2003, 2022)

Teaching/learning activity	Form of learning elicited
Teacher-managed	
Lecture, set texts	Reception of selected content
Think-aloud	Demonstrate conceptual skills
Questioning	Clarifying, seeking error
Advance organizer	Structuring, preview
Concept mapping	Structuring, overview
Tutorial	Elaboration, classification
Laboratory	Procedures, application
Excursion	Experiential knowledge, interest
Seminar	Clarify, presentation skill
Peer-managed	
Various groups	Elaboration, problem solving, meta cognition
Learning partners	Resolve differences, application
Peer teaching	Depends whether teacher or taught
Spontaneous collaboration	Breadth, self-insight
Self-managed	
Generic study skills	Basic self-management
Content study skills	Information handling
Meta-cognitive learning skills	Independence and self-monitoring

Therefore, the teacher is not the only participant in a course who can influence competence development. Instead, students also play a more positive role in competence development. As Lemke (1990) said, classroom activity systems are not determined by a single participant, regardless of how influential that individual may be. They are "dynamic, open systems of meaningful actions and meaning-making processes."

Competence-based education is a prominent innovation in a number of nations since it is anticipated to make education more authentic and appealing to students. Accordingly, graduates are expected to encounter fewer transitional difficulties when entering the workforce (Biemans et al., 2004; Van der Baan et al., 2022). In practice, however, teachers face difficulties transitioning from a conventional teaching format to a competence-based framework, such as aligning course activities with learning outcomes. When an educational approach changes, more time and effort must be invested in the shift, and teachers and students who are accustomed to traditional classrooms and instructional settings may find the move to the competence-based approach challenging (Struyven & De Meyst, 2010). For teachers, it is time intensive and competence required to break materials and skills into discrete competences that build upon one another and design corresponding activities for those competences (Hawkins et al., 2015; Raj et al., 2021). For students, the student-centered focus of competence-based learning provides students with greater autonomy and responsibility during the learning process, which may be an initially challenging

change (Orón Semper & Blasco, 2018). Moreover, many are concerned that the degree of mastery of professional skills and knowledge is declining as a result of this approach, due to the fact that teachers are providing students with less and less information and instruction (e.g., Sanusi et al., 2020; Weigel et al., 2007). However, it can be argued that the deficiency of professional competence is the outcome of the poorly designed course and not a flaw in competence-based education (Henri et al., 2017; Mulder, 2014).

In addition, applying the competence-based approach in the course remains a significant experiment due to the teachers' beliefs and competence. There is a significant gap between the paper competence outlined in the syllabus and the genuine competence constructed during the course (John et al., 2019; Serdyukov, 2021). A professor at Wageningen University noted that it is beneficial to define competence inside educational programs at a general level, but that it has become a cult with numerous forms that must be filled out in great detail (Mulder et al., 2009). It implies the cautions against the bureaucratic utilization of competence instruments in the university course. Otherwise, the competence profiles may not function as a practical tool for the development of students, but rather as a paper exercise. Overall, practically speaking, the implementation of competence-oriented development in student-centered courses is not an easy deal. It comes with a variety of requirements, including time investment, the competence and conviction of instructors, and even institutional backing.

3.2.3 Competence-based evaluation and assessment

As emphasized in the previous sections, we reiterate that student-centered learning is a fundamental concept of competence-based learning (Gervais, 2016). Wagenaar (2007) stated that utilizing learning outcomes and competencies requires student-centered course units, modules, and study programs. Admittedly, the student-centered approach is perceived as "more appropriate than conventional approaches of teaching and learning for students' competence development, especially the generic skills (Muganga et al., 2019; Rögele et al., 2022)." Thus, arranging the curriculum by competences requires awareness that students acquire knowledge and skills at varying rates and have different needs, interests, experiences, and prior knowledge (ESU, 2015). In this sense, evaluation and assessment of students' competence require centering on students individually rather than on the group.

Considering that competence is described by learning outcomes, which in the course syllabus should direct what is taught and ultimately assessed (Harden, 2002; Karanja et al., 2020). Assessment strategies are applied to conceptualize student learning outcomes, thereby measuring student learning. In detail, assessments, including summative and formative assessments, are employed to test and measure the mastery of course learning outcomes using a variety of assessment instruments (Adom et al., 2020; Biggs, 2011).

There are two predominant types of assessment with numerous specific assessment tools. The differences between summative and formative assessment are summarized in Table 23 (Guerero-Roldán & Noguera, 2018). Traditionally, summative assessment is the most prevalent in higher education. Summative assessment typically consists of a final grade, the average mark for all course activities or examinations. It is possible to combine this with a final exam or project. Paper-and-pencil test is frequently utilized in summative assessment, such as unit, comprehensive, and lab exams (Henri et al., 2017). During the COVID-19 outbreak, there was widespread concern regarding e-exams and digital assessment techniques (e.g., Butler-Henderson & Crawford, 2020;

Khan et al., 2021).

Table 23. Differences between the main types of assessment (Guerrero-Roldán & Noguera, 2018)

	Summative assessment	Formative assessment
Aim	Judging	Improving
Driving question	What have you learned?	What are you learning?
What	Measures student's achievement and understanding of a subject at a point in time	Assesses student's development of competences and acquisition of knowledge during instruction
	Progression and certification purposes; Grades	Students receive timely feedback on their learning with specific suggestions for improvement
When	After learning	During learning
How	Final exams	Portfolio
	Midterm exams	Reflective essay
	Quizzes	Rubric
		Questioning

In addition, formative assessment is an iterative process in which students obtain information regarding their learning process, take lessons from it, and improve their competences based on the feedback they receive (Xiao & Yang, 2019). Compared to the teacher's feedback, self-assessment and peer assessment can be more productive when it comes to formative assessment (Spector et al., 2016; Wanner & Palmer, 2018). Regarding formative assessment tools, portfolios, 360 degrees assessments, online assessments, self-assessments, ongoing feedback, and surveys have also been discussed in the literature and applied in practice. In reality, these two types of assessment are usually combined, even if they are not implemented exclusively.

Competence-based evaluation and assessment necessitate concentrating on the growth of each student's abilities, measuring their performance, and providing individualized feedback to aid in their learning progression. Resultantly, in competence-based education, a stronger emphasis is also being positioned on formative assessment, namely, assessments for learning (Birenbaum et al., 2006; Nsengimana et al., 2020). Furthermore, graduate competence, particularly employability, is a main concern for higher education institutions. In this regard, it is significant to impose formative assessment to evolve in order to enhance students' employability (Adnan et al., 2019). Besides, ESG highlights the value of formative assessment for student-centered learning. One of the standards in ESG (2015) stated that: "Institutions should ensure that the programs are delivered in a way that encourages students to take an active role in creating the learning process, and that the assessment of students reflects this approach."

However, although competence-based assessments contribute to student development, there are still critical voices while using competence assessments. And it remains a challenge for teachers in its application (ESU, 2015). Some of these issues in this respect are as follows (Bergsmann et al., 2015; Biemans et al., 2004; Brauer, 2021; Mulder et al., 2007; Wu & Jessop, 2018):

(1) Competence assessment is time-consuming;

(2) Competence assessment involves high expenses;

(3) Students' competence development takes a long time, making it challenging to assess or measure them during the course;

(4) There is an obvious need for in-service training for teachers regarding competence-based assessment;

(5) Competences are commonly formulated in a generic manner so that they lack discriminating power in assessments;

(6) There is no guarantee that students will act competently in a real professional setting, even if their performance is evaluated in a simulated professional context;

(7) Analysts of profiles of competences do not always have the availability of sufficient capability and trustworthiness to judge whether certain persons are competent or not;

(8) Evaluation research and competence research have yet to be well and adequately related so far;

(9) There are limitations of existing evaluation and assessment approaches, such as tools often focusing on single students' competences, specific aspects of the teaching process, and status assessments without considering the needs of the stakeholders.

In practice, mainly thanks to the Bologna Process, formative assessment is currently widely implemented in European universities (Guerrero-Roldán & Noguera, 2018). Orienting learning toward competencies and learning outcomes increases assessment transparency for students and facilitates quality assurance and course design (Adam & Expert, 2008; Bovill & Woolmer, 2019). In turn, thorough curriculum development is a crucial prerequisite for implementing the idea of evaluation and assessment (Bergsmann et al., 2015).

In addition, China's implementation of formative assessment in higher education is suboptimal, although it has been promoted in the last decade. Traditional evaluation and assessment forms, such as summative assessment, remains frequently employed, especially in undeveloped regions, due to various reasons, including the profoundly ingrained Confucian Heritage Culture, unbalanced education development in regions, insufficient support and training by institutions, instructors' limited assessment ability, limited formative assessment strategies, large class sizes, and even student's resistance, among others (Chen et al., 2021; Guo & Xu, 2020). It is evident that China's higher education has actually still been dominated by knowledge-based education. The overall context is not conducive to the effective implementation of formative assessment and the transition to competence-based education. China has begun to recognize the issue, and this research will provide some implications and motivation for more effective implementation of the change.

3.2.4 Aligning assessment with competences and learning activities in student-centered course: Constructive alignment theory

The EHEA has contributed to bringing the two core tenets of the BP to the fore: student-centered learning and competence-based curriculum (Bucharest Communiqué, 2012). Theoretically, the competence-based curriculum is distinguished by competences (rather than objectives), learning outcomes (rather than content), student-centered instructional activities (rather than teacher-led), and formative assessment (Nsengimana et al., 2020). In this context, "alignment" is a recognized solution for effectively implementing a competence-based course. Alignment refers to what the instructor assists students in attaining the intended learning outcomes through learning activities

(Anderson & Krathwohl, 2001; Biggs & Tang, 2010; Wilhelm et al., 2019).

Constructive alignment was devised by professor John Biggs, resulting from a trial with portfolio assessment – worked so well – in a bachelor of education program. The course, named *The Nature of Teaching and Learning*, was a senior-level educational psychology course for in-service teachers (Biggs & Tang, 2011). This portfolio experiment was generalized to the pedagogical design, known as "constructive alignment." Specifically, the adjective "constructive" is derived from the constructivist theory that students utilize their activity to construct their knowledge as interpreted via their own established schemata (Cakir, 2008). "Alignment" comes to a principle in curriculum theory that assessment tasks should be aligned with what is desired to be learned (Biggs, 2003; Lok et al., 2016). Shuell's (1986) claim that "what the learner does is substantially more essential in deciding what is learned than what the teacher does" is extended through constructive alignment. It implies that emphasis is placed on what and how students learn, instead of the themes the teacher is to teach.

According to the principle of constructive alignment, the intended learning outcomes must be grounded on what students can achieve. These intended learning outcomes must be aligned with the teaching and learning activities, which should, in turn, be aligned with the formative and summative assessment strategies. To realize the alignment, the teacher is responsible for providing a learning environment that encourages students to engage in these activities throughout the teaching and learning process.

Moreover, this alignment helps both instructors and students to benefit from transforming abstract learning into practical learning experiences that can be measured continually (formative assessment), ensuring that learning is indeed occurring prior to the administration of the summative assessment. Such summative assessments, like exams, are conducted after students have learned a subject as required by the syllabus. As a result, the final grade, particularly in the study program, will be reflected the product of the previous alliance, where reflections and adjustments should be made in the subsequent course to optimize previous weak out-turns. Accordingly, the processes of teaching and learning become cyclical (Biggs, 2003, 2014; Li et al., 2022; Rogerson-Revell, 2015).

Designing the course with constructive alignment theory is not a simple task. After deconstructing the prototype example of constructive alignment in the course *The Nature of Teaching and Learning* (Biggs & Tang, 2011) and incorporating the competence-based curriculum design phases (Guerrero-Roldán & Noguera, 2018), we summarized three stages in the course design:

(1) Describe the intended learning outcome in the form of a verb (learning activity) and its object (the content) and specify the context and a standard the students are to attain;

(2) Construct a learning environment, employing teaching/learning activities that target that verb, thus, are the potential to enhance student engagement and achieve the intended learning outcomes;

(3) Develop assessment tasks that also contain that verb, allowing teachers to evaluate, with the aid of rubrics, if and how well students' performances fulfill the criteria and whether they can demonstrate their command of the subject, ultimately translating these assessments into standard grading criteria.

For more clarity and visualization, Figure 5 depicts the whole procedure, which can be applied as a general teaching framework. Although constructive alignment is oriented in a

professional program, it can be implemented in virtually any course at any level of university teaching (Biggs & Tang, 2011; Hailikari, 2022).
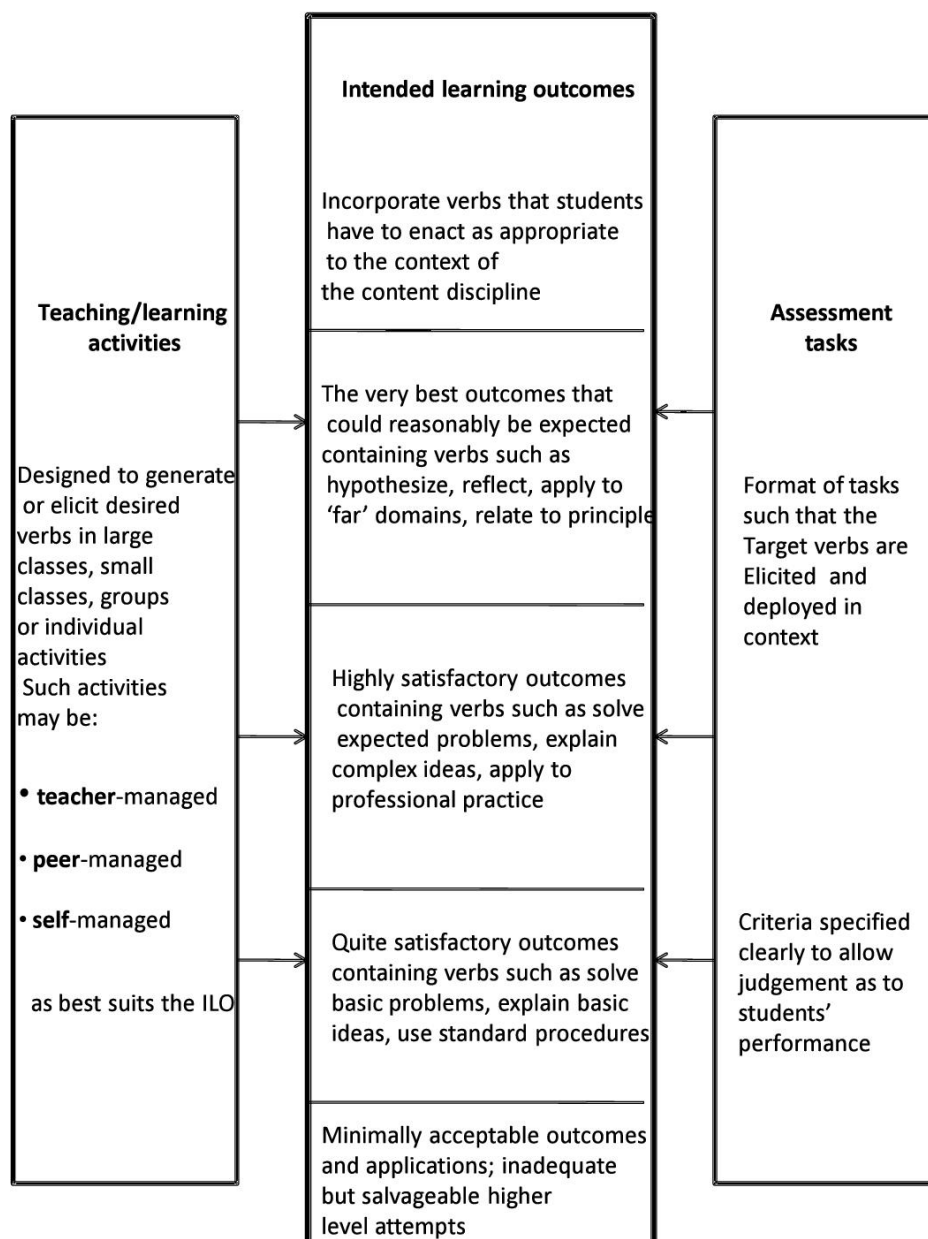
Figure 5. Aligning intended learning outcomes, teaching and assessment tasks (Biggs & Tang, 2011, p. 105)

Constructively aligned teaching and learning tend to be more effective than unaligned ones because there is maximal consistency throughout the system (Hattie, 2009; Trigwell & Prosser, 2014). All system components address the same objective and mutually support one another. In competence-based courses, constructive alignment is also beneficial in putting the student at the center of course design (Ngatia, 2022). This is because constructive alignment promotes students themselves to perform the actual work, where the teacher acts as a "middleman" between students and the learning environment that backs the proper learning activities.

In the past decade, the philosophy and application of constructive alignment have been

widely championed in educational research in an effort to enhance the associations between various course design elements, including competence, learning outcomes, learning activities, teaching and learning approaches, assessment, and resources (Biggs & Tang, 2011; Kandlbinder, 2014; Loughlin et al., 2021; Yang, 2009). Studies suggest that alignment positively affects both the effectiveness of pedagogical approaches and student involvement (e.g., Ajjawi et al., 2020). More importantly, it has been demonstrated that constructive alignment helps ensure that courses are student-centered and competence-based, and that students are aware of the steps they must take to attain their objectives (e.g., Guerrero-Roldán & Noguera, 2018; Ngatia, 2022).

Unfortunately, in practice, teachers continue to be confused and uncertain regarding how to implement constructive alignment, though researchers highlight the benefits of it in course design (Chan & Lee, 2021; Huxham et al., 2015). Visibly, in university teaching and learning, there are still many courses that have not achieved constructive alignment, mainly attributed to the following reasons:

(1) Constructive alignment could be difficult for teachers who lack expertise in assessment design and advanced pedagogy – this reveals why it can be challenging to comprehend and develop these types of processes (Huizinga et al., 2014; Rapanta et al., 2021);

(2) Traditional teaching and grading procedures overlook alignment. A prevalent technique for evaluating students' marks is norm-referenced, that is, comparing students to each other instead of focusing on whether an individual's learning achieves the intended outcomes (criterion-referenced). There is no intrinsic relationship between what is taught and what is measured in the first scenario. The objective is to differentiate student performance so that teachers can clearly distinguish the good students from the less good ones, and not to assess how well individuals have learned what they were expected to acquire (Biggs & Tang, 2011);

(3) Teachers' teaching and learning perspectives are cemented and devoid of reflection – they believe there is nothing wrong with the current method of instruction. Indeed, a defining trait of reflective faculty members was their constant pursuit of student feedback to refine their teaching (Hattie, 2009; Luckay, 2019);

(4) Resource constraints lead to large classes with mass lectures and multiple-choice exams. These elements make alignment more challenging, but it is still possible (Biggs et al., 2022; Deibl et al., 2018).

Overall, continued endeavors will be required to promote the implementation of constructive alignment in the coming days. Universities need to emphasize teachers' professional development and demonstrate how theories and technologies can improve teaching and learning by going beyond conventional practices. In this study, we will adopt the constructive alignment theory to examine practical cases of teaching and learning in the university classroom.

3.2.5 Course design: Related models for constructive alignment in student-centered course

The literature offers dozens of curriculum theories and systematic instructional design models for effective teaching and learning. However, in practice, the three main course design techniques widely used are the ADDIE model, the instructional design matrix model, and the backward design. Being student-centered and outcome-based, Biggs' Constructive alignment is influential in higher education. These design models are, to some extent, underpinned by constructivism and comply with constructive alignment. In this section, we will re-emphasize these three design models with the expectation that their shadow will be observed in the empirical study.

ADDIE model. ADDIE is an instructional system design framework many instructional designers use to develop courses (Morrison, 2019). The name "ADDIE" is an acronym for the five phases, standing for analyze, design, develop, implement, and evaluate, without a strict sequence or linear progression through the steps (Dick et al., 2011). It is helpful for course designers since there are stages clearly defined to facilitate the implementation of effective instructional tools. Currently, most instructional design models are variations of the ADDIE model (Piskurich, 2015).

The ADDIE model's fivefold framework encompasses all elements of the instructional design procedures (Dick et al., 2011; Seel et al., 2017). The analysis stage involves the course goal, content, task, learner, and learning environment. The design stage address how instructional goals shape strategies and assessment, forming the course syllabus. The development stage entails creating instructional materials, learning activities, environment, and platform. The implementation stage covers the educational interventions utilized to execute the course. The evaluation stage refers to formative and summative assessments of the learning outcomes. In this model, the whole course design is considered a closed-loop process, as presented on the left in Figure 6.

Another perspective on the ADDIE model is that assessment should not be at the final stage but throughout all sessions to demonstrate that learning is process-oriented. In this regard, as indicated on the right side of Figure 6, some scholars argue that the assessment stage is the "centerpiece" of the model, connecting each of the other four stages, as shown on the right side of Figure 6 (Allen, 2006; Molano, 2022). This is the process of integrating assessment into the design and implementation of teaching and learning.

In either view of the framework, the instructional design demands a system to align all the components to improve the teaching and learning process. Moreover, Gustafson and Branch (2011) identified six characteristics of the systematic ADDIE model:

(1) Instructional design and learning activities are student-centered;

(2) Instructional design is an outcome-based process;

(3) The student can perform specific and significant behaviors and solve practical problems;

(4) There are particular indicators of learning outcomes, and the assessment method demonstrates both reliability and validity;

(5) The instructional content is based on accumulating empirical evidence;

(6) The curriculum design requires teamwork.

According to Zhao (2018), by removing the analysis and implementation phases and considering the components of course design exclusively, the ADDIE model can be streamlined into a triangle course design framework, as shown in Figure 7. The triangle framework coincides with Biggs's philosophy of constructive alignment, which comprises learning outcomes (referring to learning general goal and specific objectives), learning activities (including teaching approach and learning approach), and assessment. More specifically, teaching and learning activities should be helpful in achieving specific learning outcomes, and assessment should provide evidence and indicators of mastery of learning outcomes. These three elements are to be aligned, interconnected, and mutually reinforcing.

In sum, the ADDIE model has been evolving. In the last decade, the ADDIE model is not only applied in the traditional discipline, but also developing to use in the online course and interdisciplinary learning (e.g., Tu et al., 2021; Zhang, 2020).
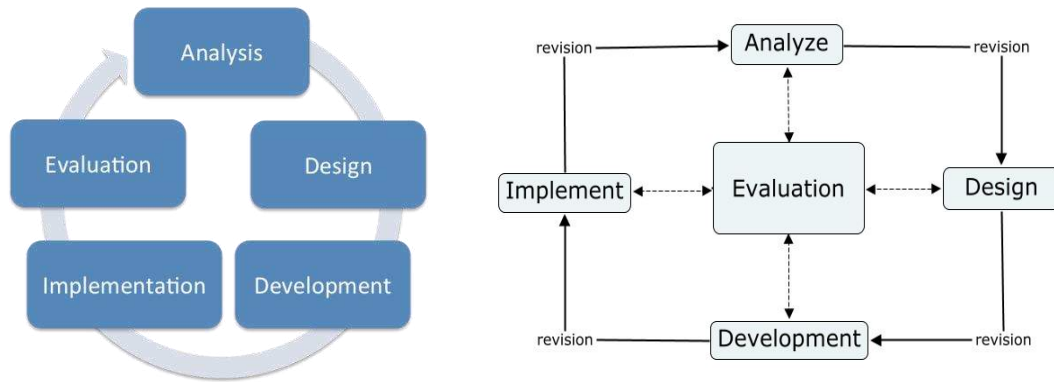
Figure 6. Two types of ADDIE model (Peterson, 2003; Zhao, 2018)

Instructional design matrix model. For how to operationalize the steps of course design concretely, compiling an instructional design matrix model is a common approach (e.g., Martin, 2011; Suartama et al., 2019). When the triangular course design framework mentioned above is unfolded and parsed, it turns into a matrix.

As observed in Table 24, the curriculum matrix is horizontally divided into five columns: general goals, specific objectives, teaching methods, learning methods, and assessment. Vertically, the student's learning outcomes are listed, based on a sequence of lower-order competences to higher-order competences, as well as maintaining the alignment between the other elements, including teaching, learning, and assessment methods. Like the prototype of the syllabus, the course matrix clearly demonstrates the teaching and learning process and outcomes to students.

Table 24. Example of instructional design matrix model (Zhao, 2018)

General goals	Specific objectives	Teaching methods	Learning methods	Assessment
A	Describe	T1	L1	A1
	Decompose	T2	L2	A2
	Identify	T3	L3	A3
B	Determine	T4	L4	A4
	Calculate	T5	L5	A5
	Assemble	T6	L6	A6
C	Examine	T7	L7	A7
	Discuss	T8	L8	A8
D	Write	T9	L9	A9
	Report	T10	L10	A10

Although the roles of the course matrix and course syllabus are identical, their philosophies and compilation processes are separate (Rothwell & Kazanas, 2011; Zhao, 2018). When compiling a course syllabus, instructors are accustomed to entering the matrix from left to right, meaning that general goals are listed first, followed by specific objectives, teaching techniques, learning methods, and assessments (frequently exams). The right line for using the course matrix, however, is as follows: specific objectives first, which are also considered learning outcomes, preceded by assessment design, learning methods, and ultimately the selection of the appropriate

teaching methods and a summary of the expected competence of students in the course. The varying organization of constructing the matrix reflects a distinct instructional perspective. The former reflects a more traditional philosophy of education, whereas the latter embodies student-centered and competence-based philosophy. Table 25 exhibits the logic and flow of this instructional design. This is also known as backward design, which we will introduce next.

Table 25. Backward course matrix design procedure (Zhao, 2018)

General goals	Specific objectives	Teaching methods	Learning methods	Assessment
Step 5 Refer to general goal	Step 1 Refer to specific learning outcomes, including knowledge and skills	Step 4 Refer to how teachers teach to help students achieve the intended outcomes	Step 3 Refer to how students learn to achieve the intended outcomes	Step 2 Refer to convincing evidence

Backward design. The backward design is an influential method for achieving results-based instruction emphasizing student acquisition of knowledge and skills (Barr & Tagg, 1995; Li & Yang, 2020). Following the backward design framework (Wiggins & McTighe, 2011), course design is divided into three steps: identify desired results, determine acceptable evidence, and plan learning experiences and instruction (as shown in Figure 8). In this sense, backward course design required teachers to consider desired student-learning outcomes first, then appropriate assessment manner to measure the outcomes, and finally, the activities that would support these outcomes. Thus, combining the backward design with the matrix model, the steps of instructional design as follows (presented in Table 25):

(1) Identify specific objectives and determine what knowledge and skills will be developed.

(2) Designing the assessment methods to ensure that they provide evidence to measure mastery of the intended learning outcomes.

(3) Selecting student learning methods to promote self-directed learning.

(4) Selecting teaching methods to help students to achieve the intended learning outcomes.

(5) Finally, form the overall course learning general goals, that is, the intended competence.

The matrix can be populated either by rows or columns. Regardless, we must notice that the alignment between the elements is still maintained either way (Cranney et al., 2020; Dolan & Collins, 2015). This instructional design is adaptable to both the planning of major units of a syllabus and the planning of each course unit within a unit.

The backward design is regarded as effective in improving teaching and learning. Empirical research revealed that the students were significantly more engaged in class, and class time was markedly more active after adopting the backward course design (e.g., Reynolds & Kearns, 2017). Rather than spending most of their time passively listening to PowerPoint lectures, students participated in activities requiring full involvement, including group conversation, teamwork, and presenting and applying course competence to real-world projects.

Furthermore, one hindrance to an active, student-centered classroom is psychological, stemming from cultural norms that portray the instructor as the knowledge-content-delivery agent

(Hannafin & Land, 1997; Serrano et al., 2019). Backward course design's simple, rational framework for student-centered learning is helpful in reversing this occurrence. It vests the teacher with a novel source of authority as the facilitator – the capability to determine the critical competences students need to acquire, authentic manners for students to show their learning, and diverse and active ways to develop the competence (Brenner et al., 2020).

Figure 7. Triangle course design framework (Duke Flexible Teaching, 2022; Zhao, 2018)
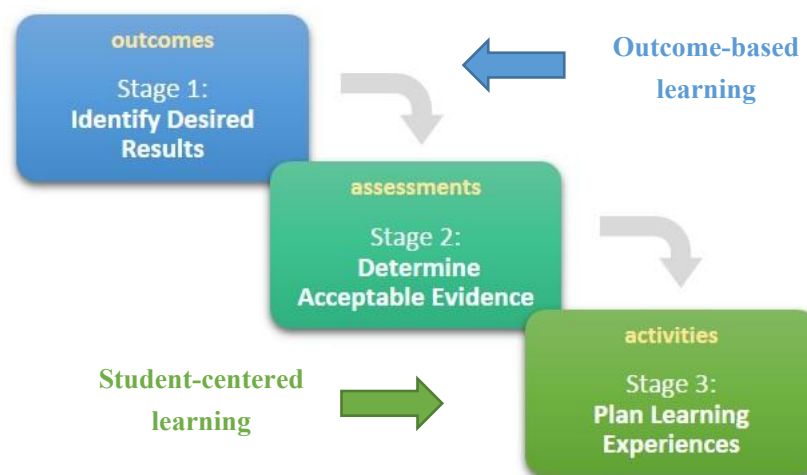
Figure 8. Backward design (Wiggins & McTighem, 2011)

However, other scholars debate that professional development experiences in backward course design may bring limited progress in teachers' real practices toward student-centered learning (Ebert-May et al., 2011; Sbeglia et al., 2021). One of the leading causes is that it was difficult to break away from engrained beliefs and practices of content-based lecturing, even armed with this design framework (Hackett, 2019). Indeed, professional development is also essential for implementing the backward design (Benabentos et al., 2021), as it is challenging for teachers to apply the backward design at the course level in their daily instruction. Scholars revealed that, compared to other levels of education, teachers receive relatively little direct instruction on course design in higher education (Popova et al., 2022; Wulff et al., 2004).

For such, considerable effort has been made to improve it from university and college teaching centers and the academic community. Teacher development centers at universities and colleges combat this teacher's competence disparity through Web-based resources and activities,

such as workshops and seminars, that assist teachers in putting backward course design into practice (Drake & Reid, 2018; Wiggins & McTighe, 2011). Furthermore, publications aim to inform faculty members about the theories and techniques of backward course design in varied contexts (Bhute et al., 2021; Dolan & Collins, 2015; Martin et al., 2019). Such sources boost university teachers' knowledge of backward course design principles and consideration for student-centered teaching and learning practice; nonetheless, the effect still requires more strengthening.

In conclusion, systematic course design is effective for fostering student-centered teaching and learning and the development of students' competences. An aligned course design comprises three major steps: defining student learning outcomes, selecting learning activities, and assessing actual student learning outcomes. It is crucial to consistently maintain constructive alignment among the elements throughout the instructional course design, with the end goal of assisting students in achieving the desired learning outcomes. However, the majority of educators require professional training to be competent in applying systematic instructional design methods. Changes in teacher perceptions also need to be subtle, likely one of the largest barriers to realizing the student-centered approach. Like many instructors believe that everything they do is student-centered, but in reality, little changes (Nair, 2019). It would be tougher to rely entirely on teachers to figure out and shift their mindset on their own. Therefore, encouraging extensive teacher professional development and raising awareness of student-centered, competence-oriented teaching and learning is imperative to improve the quality of teaching and learning effectively.

3.3 The Student-centered approach in relation to students' competence development: A systematic review and analysis

In addition to examining the history, concept, policies, and theories of student-centered approach and competence, we will also conduct a comprehensive review of the published qualitative research, quantitative research, and case studies on these two subject matters. It is important to note that there is a significant amount of research on them. However, limited research is on the relationship between the student-centered approach and students' competence development, especially in comparative studies.

In that regard, this section aims to develop a systematic review of the relationship between the student-centered approach and students' competence development, intending to analyze which factors in the student-centered approach are associated with students' competence. To attain this goal, we divided the following steps:

(1) What are the situation and main research issues related to the student-centered approach in higher education in western countries and China?

(2) Are students' competence development associated with the student-centered approach?

(3) How is the student-centered approach promotes students' competence for development?

Methodology. To answer the first and second questions, we used the CiteSpace software to analyze the development of student-centered related research and its current status, to reveal research hotspots and trends. For answering the third questions of identifying the association between student-centered approach and students' competence development, and their influencing factors, the Preferred Reporting Items for Systematic Reviews (PRISMA) statement was applied as a formal systematic review guideline for data collection and analysis in-depth (Moher et al., 2009). Data were taken from studies over the period 1999-2022. We have chosen 1999 as the

starting point for statistical analysis of the relationship between student-centered approaches and competence development for the following reasons. On the one hand, 1999 was the beginning of expanding the scale of higher education in China. At that time, China's higher education gross enrollment rate was only about 2.7%, far below the level of about 80% in developed countries. Since then, China's higher education has expanded rapidly, shifting from elite to mass higher education and moving into universalization in 2019 (over 50%, according to Martin Trow). The rapid expansion has led to a decline in the quality of teaching and learning, raising concerns about the teaching and learning modes among various stakeholders. The student-centered research thus has been noticed in China since the late 1990s. On the other hand, the Bologna Process has been underway since 1999. Driven by the Bologna process, the student-centered approach moved from the periphery to the center. Therefore, we chose the data starting from 1999.

Data sources and search strategies. We systematically searched two digital databases, Web of Science (WoS) and China National Knowledge Infrastructure (CNKI), between the years 1999 to 2022. These are two widely regarded databases for the Western and Chinese scientific systems, respectively (for evaluation and funding), which is why we used them in our research. We identified peer-reviewed articles with English and Chinese-language publications. Databases were searched separately by the researcher. By searching for "student-centered" as a keyword in these two databases, we first identified and analyzed whether the shadow of competence development was present in studies pertaining to the student-centered approach, in order to extrapolate their initial relationship. If this requirement is met, we shall perform an in-depth search and examine it. To more precisely identify qualifying research, the WoS database was searched using the terms "student-centered," "student competence," and "higher education" as keywords for all fields. For the sake of rigor and uniformity, in the CNKI database, search terms are "student-centered" and "student competence" as subject matters, and selecting the fields of "higher education." The reference lists of papers deemed eligible after an electronic search were also manually searched. The researcher then independently reviewed titles and abstracts using the abovementioned criteria to determine article eligibility for inclusion in the study. For final inclusion, the full text of potentially relevant studies was reviewed.

The number of related publications on the student-centered approach in higher education. The researcher searched "student-centered" (以学生为中心) and "higher education" (高等教育) in the WoS and CNKI databases, respectively. As depicted in Figures 9 and 10, the trend of research on student-centeredness in China and the West, as measured by the number of publications in the academic literature, is largely consistent, with a progressive growth from 1999 to the present. In China, the focus on student-centeredness in higher education began to increase dramatically in 2012 and reached its pinnacle in 2020. Given the government-led nature of higher education in China, then-national President Hu Jintao's 2011 address at the centennial celebration of Tsinghua University emphasized that "continuously improving the quality of higher education is the lifeblood of higher education, and the quality of teaching and learning is fundamental," motivating to provoke scholars to attention on the teaching and learning approach reform, especially the student-centered approach. In July 2012, the International Conference on "Transforming to Student-Centered for Undergraduate Education" was held by the Institutional Research Branch of the Chinese Association of Higher Education, and approximately 400 experts from China and abroad attended, sparking heated discussions on this topic. Comparatively, the highly student-centeredness concern emerged earlier in Western nations. The research on

student-centered learning started to surge in 2010 and peaked in 2019. In the European context, for example, student-centered learning was an explicit policy goal with a broader definition in the Bologna Process in 2009. In the most recent two years, it has continued to be the focal point of teaching and learning attention, despite a slight decline in the number of studies on this topic.

Related topics on the student-centered approach. We import the data searched in the WoS database into CiteSpace software for visualization and scientometric analysis, which supports structural analysis of various networks derived from scientific publications (Chen, 2006). The keyword and category co-occurrence analysis of CiteSpace can primely present the research trends and topics in the investigated field by calculating the frequency of two keywords appearing in the same document (Chen, 2014). In other words, it can reveal the relevant studies of student-centered and initially examine whether it is research-relevant to students' competence development.

Figure 11 exhibits the co-occurrence network of keywords associated with student-centered research. Each node represents a keyword, each link between nodes reflects their co-occurrence relationship, and the larger the size of the node, the more frequently the term occurs. Thus, it could be observed that, in terms of student-centered learning in higher education, there have been many studies on how teachers teach, students learn, and specific learning methods in the last two decades, such as flipped classroom, problem-based learning, active learning, blended learning, collaborative learning, and others. Moreover, it identifies certain influential aspects of student-centered learning, such as curriculum design, motivation, engagement, model, and professional development. In the preceding section, competence was defined as the learning outcomes, including knowledge, skills, and attitude. Figure 11 demonstrates that there are associations between student-centered learning and them, but it is limited, notably for the term competence.
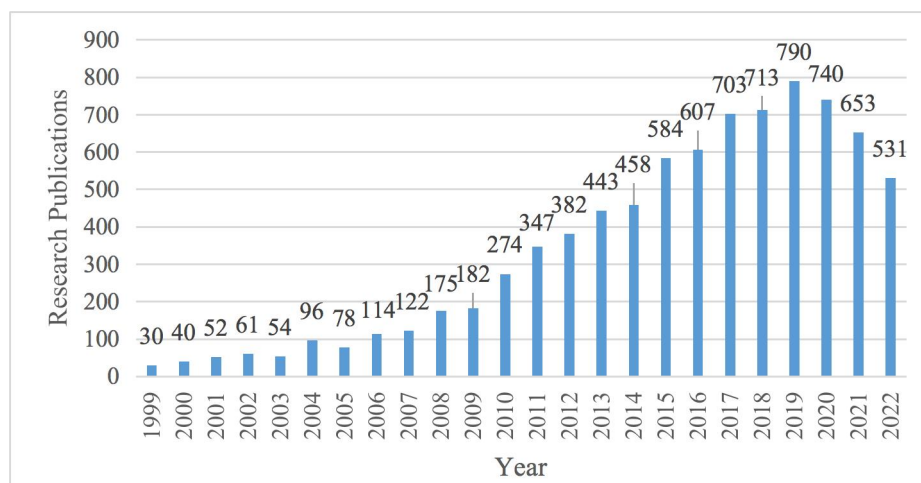
Figure 9. Distribution of annual publication outputs on student-centered in higher education from 1999 to 2022 in the WoS database

Figure 10. Distribution of annual publication outputs on student-centered in higher education from 1999 to 2022 in the CNKI database

Figure 11. Research related to the student-centered approach and competence in western countries (1999-2022)

Since most of the literature in the CNKI database are Chinese articles, we offer the student-centered approach-related study themes as bar charts (Figure 12). In China, studies on the student-centered approach focus primarily on more macro-level issues, such as teaching reform, teaching mode, and effective teaching, as opposed to the micro-level studies conducted in Western countries. Moreover, it is evident that the student-centered related studies mainly focus on four aspects: philosophy of concepts, teaching methods, curriculum design, and some university practices, which are compatible with Zhi's findings from 2020. However, there has been limited research on the relationship between the student-centered approach and competence development, as demonstrated in the last item of Figure 12, as well as the lack of related research regarding knowledge, skill, or attitude.

Overall, existing studies in the west and China indicate a correlation between the student-centered approach and students' competence development. However, there is still much

room for this area. This study aims to determine how the student-centered approach influences the development of students' competences and which competences are affected during the teaching and learning process.
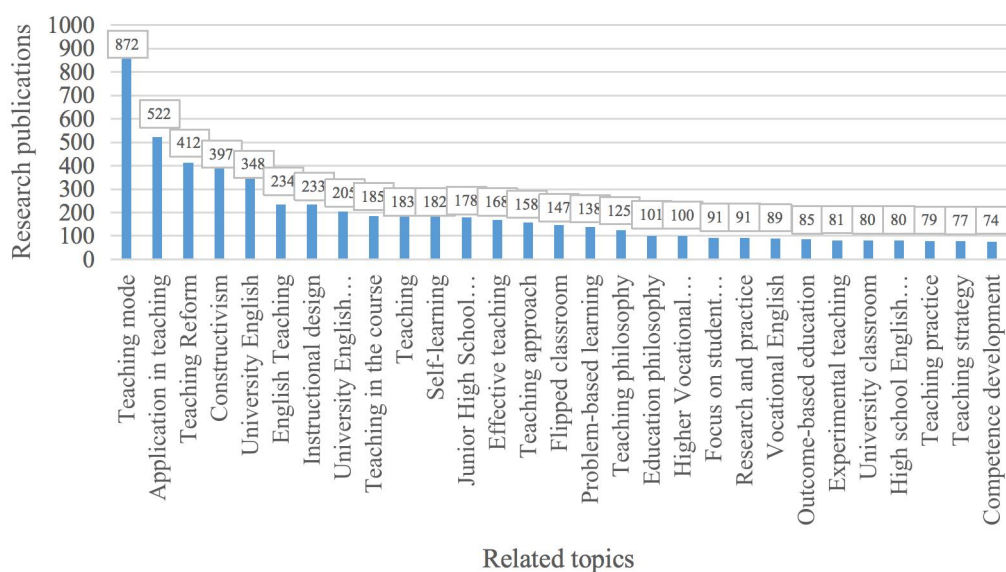
Figure 12. The related topics on student-centered in China over the years (1999–2022)

Identifying the influencing factors. To thoroughly determine the important factors, we begin by constructing the analysis corpus. The researcher searched "student-centered" (以学生为中心), "student competence" (学生能力), and "higher education" (高等教育) in the WoS and CNKI databases, respectively.

Inclusion and exclusion criteria. The review articles were defined in three rounds. The screening of the title and abstract was the first phase of analysis. The second round was the analysis of the articles. The criteria for selection were based on the research question. We removed studies for which no full text was available. In the third round, the research consolidated all results and conducted a thorough analysis of the selected papers to determine their inclusion in the study. To address our proposed research questions, we eliminated any articles that did not describe studies examining the process and results of the student-centered approach in relation to the development of students' competence. Finally, the included articles were coded with a number. Bardin (2011)'s methodologies and processes were utilized for the thematic content analysis of the articles.

The inclusion criteria-based search generated a total of 283 articles (219 articles in the WoS database and 64 in the CNKI database). After applying exclusion criteria (Figure 13), the researcher whittled this number down to 95 publications pertinent to the current systematic literature review, since some excluded articles did not contribute directly to our research questions and were irrelevant. Consequently, 95 papers are ultimately selected.

The table in Appendix A lists all the pieces included in the systematic review (n = 95), and the codification (number of the article and its database, W = Web of Science, C = CNKI) utilized to identify each article.
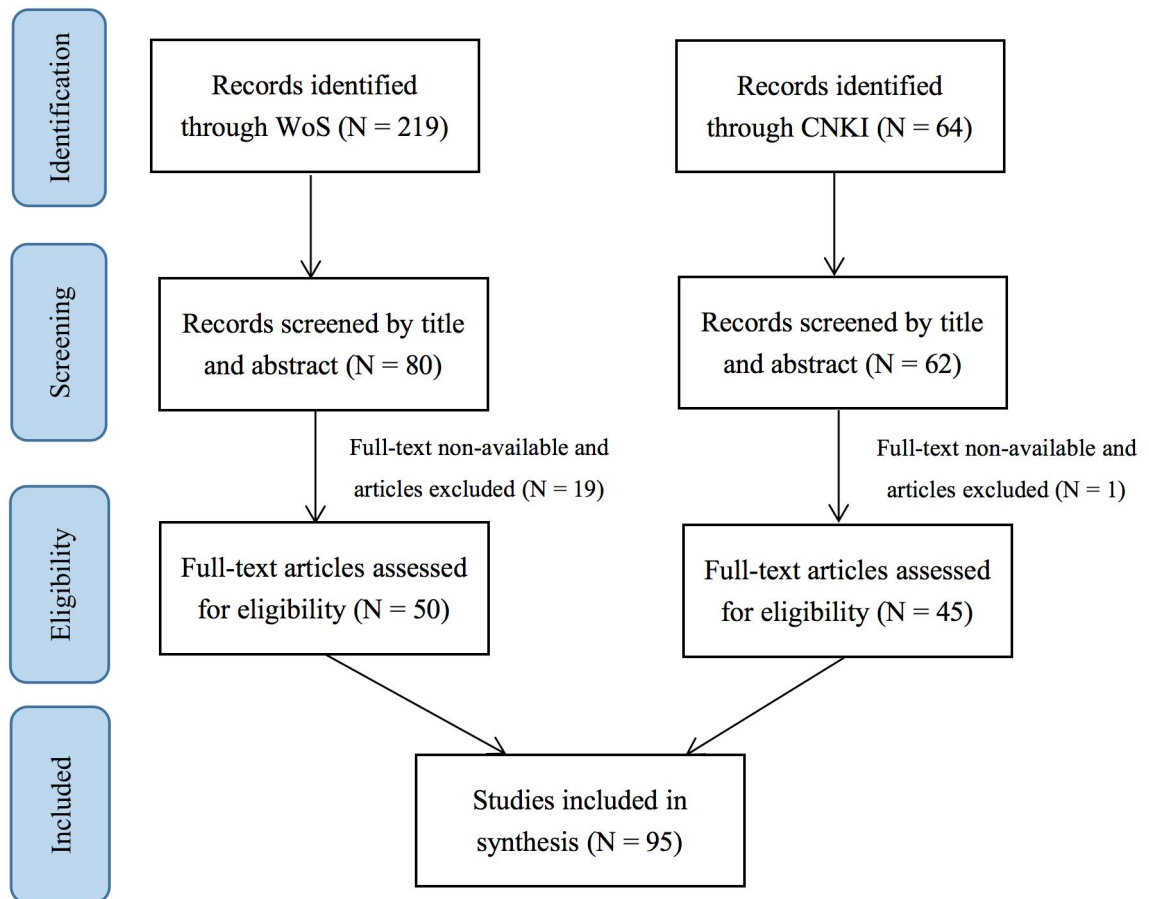
Figure 13. Reporting items for the systematic review, adapted the PRISMA flow diagram (Abelha et al., 2020)

Table 26. Number of articles by field of knowledge

Field of knowledge	Number of articles
Engineering	17
Management, Accounting, Marketing, Business	3
Advertising	1
Psychology, Pedagogy, Education	3
Translation	2
Mathematics	1
Medicine, Nursing	12
Language (English, French)	3
Industry	5
Tourism	2
Information Technology	4
Sports	1
Multiple areas	6
No specific field of knowledge identified	35
	Total = 95

Results. In this section, we present the results found through the review process, and organize

them according to the research questions that guided our search and analysis. First, we will address some characteristics of included publications. Second, we will answer the third question based on the evidence in the collected articles – how is the student-centered approach promotes students' competence for development, and which competence?

Characteristics of included articles. From the collected articles, there are two characteristics after analysis and conclusion. Regarding the field of knowledge, the following table (Table 26) displays the different areas of knowledge that are focused on by the publications included in our search results. Published available studies concentrate primarily on the general realm of knowledge. Some specific fields included in studies are engineering, medicine, nursing, industry, information technology, management, business, advertising, psychology, education, translation, mathematics, language, tourism, and sports. There are also several studies that encompassed multiple areas of knowledge. It is apparent that engineering, medicine, and nursing studies are relatively prosperous compared to other disciplines such as education.

In addition, despite the fact that the majority of studies on the student-centered approach and students' competence were conducted separately, meaning that relatively few examined the relationship between the two, the studies selected from different databases exhibited distinct characteristics, particularly in terms of research methodology. On the one hand, the distribution of qualitative and quantitative research among the 50 papers in the WoS database is reasonably balanced, with 27 qualitative studies, 17 quantitative studies, and six mixed-methods studies. There are 33 case studies included. Almost the majority of the articles demonstrated the relationship between the student-centered approach and students' competence using data or practical cases. On the other hand, the vast majority of the 45 publications in the CNKI database used qualitative research methods, with 27 case studies, whereas there were very few quantitative research articles. Moreover, the empirical studies prove the relationship is limited, except for 36C and 42C. It implies that more evidence in future research must substantiate the association between the student-centered approach and the development of students' competence, especially in the cases in China.

Classification of competence influenced by the student-centered approach. The researcher reviewed the analysis corpus to determine which types of students' competence were influenced by the student-centered approach. Clearly, the promotion of competence is a priority for academics in higher education, and studies are addressing this topic. One issue uncovered by our analysis is that the majority of articles concentrate on certain abilities, which may be professional or transversal and are referred to as soft skills in some studies. In accordance with the definition of competence, the competence was identified and segmented based on three key categories: professional knowledge and skill, general skills, and attitude, as shown in Table 27.

Looking into the specific competence that was analyzed by the studies, all publications involved the professional knowledge and skill positively impacted by the student-centered approach. Moreover, some general skills stood out – namely, practical skills (40 articles), communication skills (28), self-learning (37), problem-solving skills (34), teamwork (32), critical thinking (28), creativity (25), innovative skills (25), and employability (23), among others. These general skills are acknowledged to be beneficial in the transition from academia to the workplace and in coping with the challenges of the changing world (Römgens et al., 2020). Besides, the focus on these transferable skills implies that it is increasingly expected the match between university students' competences and the requirements of the labor market (Abelha et al., 2020;

Kenayathulla et al., 2019). Moreover, it is possible to identify a focus on attitude, mainly including the active and positive attitude toward learning (66 publications), autonomy (32), responsibility (24), self-motivated (24), improving the learning interest (18), and self-confidence (17), and others. According to the OECD learning compass 2030 (2019), attitudes and values are essential components to guide students toward well-being and the future they desire.

As can be seen, competence encompasses more broad general skills and attitudes. It prepares university students to confront the world, regardless of whether they wind up working in a field directly related to their education or whether they change careers at some point in their professional lives. It is impossible to assert that the student-centered approach (including the competence-based) will be the future of all education, but it is currently one of the preferable alternatives.

Table 27. Categorization of students' competence analyzed by articles

Article	Categorization of students' competence
1W	Professional knowledge and skills; General skills: self-regulation, employability, self-learning; Attitude: autonomy, responsibility, psychological needs, self-confidence.
2W	Professional knowledge and skills; General skills: self-learning, innovative skill, practical skill, employability, creativity, self-decision, communication and presentation skills, management skill; Attitude: spread spiritual, aesthetic, moral and social value.
3W	Professional knowledge and skills; General skills: critical thinking, independent thinking, self-learning, self-discipline, problem-solving, creative thinking; Attitude: all-round development of cultured personality, responsibility.
4W	Professional knowledge and skills; General skills: self-learning, practical skill, communication skill, teamwork, obtaining information skill, problem-solving skill, writing skill; Attitude: self-motivated, ethics, positive attitude, increase interest.
5W	Professional knowledge and skills; General skills: self-leadership, emotional competence, emotional intelligence, emotional regulation, social skill, self-directed, emotional self-control; Attitude: emotional awareness, autonomy, emotional well-being.
6W	Professional knowledge and skills; General skills: problem-solving, innovative skill, creativity, diversity management, intercultural communication skill, interpersonal skill; Attitude: respect and appreciate others' differences, self-motivated.
7W	Professional knowledge and skills; General skills: employability, civic competence, social skill, problem-solving, creativity, information literacy, critical thinking. Attitude: positive attitude toward learning.
8W	Professional knowledge and skills; General skills: communication skill, interpersonal skill, social skill, cooperation skill, organizational skill, oral and written presentation skills;

Attitude: cultural sensitivity, responsibility, self-motivated, positive attitude toward learning.

9W   Professional knowledge and skills;

General skills: digital skill, information and communication technology skill;

Attitude: responsible for learning.

10W   Professional knowledge and skills;

Attitude: positive attitude toward learning.

11W   Professional knowledge and skills;

General skills: learning to learn, employability, teamwork skill, cooperative skill, cognitive skill, oral communication skill, effective information management, written communication skill, information and communication technology skill, critical and creative thinking, planning, organization and time management, self-assessment, self-control, self-regulation, problem-solving skills;

Attitude: active and positive attitude toward learning, responsibility, self-confidence, motivation, self-esteem, emotional well-being, resilience, empathy, self-awareness, ethical spirit.

12W   Professional knowledge and skills;

General skills: digital skill, disciplinary, teamwork, oral communication skill, critical thinking;

Attitude: active attitude toward learning.

13W   Professional knowledge and skills;

General skills: communication skill, self-reflection, practical skill, information exchange skill;

Attitude: autonomy.

14W   Professional knowledge and skills;

General skills: employability, creativity, analytical skill;

Attitude: positive and active toward learning, autonomy.

15W   Professional knowledge and skills;

General skills: cooperation skill;

Attitude: responsible for learning.

16W   Professional knowledge and skills;

General skills: teamwork, problem-solving.

17W   Professional knowledge and skills;

General skills: communication skill, practical skill, information gathering skill, analytical skill, self-assessment;

Attitude: responsible for learning, active in learning, self-motivated.

18W   Professional knowledge and skills;

General skills: employability, practical skill, information gathering, problem-solving skill, reflective thinking, self-learning;

Attitude: motives of self-realization and self-affirmation, autonomy.

19W   Professional knowledge and skills;

General skills: creativity, interpersonal skill, logical reasoning, problem sensitivity, employability, skill to adapt changes, entrepreneurial skill, cognitive abilities, critical thinking, teamwork, flexibility;

Attitude: responsibility, personal branding, self-awareness, self-motivated.

20W   Professional knowledge and skills;

General skills: scientific reasoning, communication skill;

Attitude: positive attitude toward learning, psychological needs, self-motivated, ethical and social responsibility, autonomy, learning interest.

21W   Professional knowledge and skills;

General skills: teamwork, collaborative skill, problem-solving skill, skill to express, self-confidence, critical thinking, initiative, innovative skill, self-regulation, cognitive skill, time management skill;

Attitude: self-motivated, responsibility, active toward learning.

22W   Professional knowledge and skills;

General skills: practical skill, critical thinking, problem-solving, self-assessment, flexibility;

Attitude: responsibility.

23W   Professional knowledge and skills;

General skills: practical skill;

Attitude: positive toward learning, learning interest.

24W   Professional knowledge and skills;

General skills: employability, life-long learning, teamwork, leadership skills, communication skills, reflective behavior practice, interdisciplinary skills, recognizing disciplinary perspective, organizational skill, problem-solving skill;

Attitude: autonomy, responsibility, contextual awareness.

25W   Professional knowledge and skills;

General skills: practical skill, problem-solving skill, communication skill;

Attitude: active attitude toward learning, critical attitude.

26W   Professional knowledge and skills;

General skills: employablity, applied skill, practical thinking, permanent learning;

Attitude: positive attitude toward learning, learning interest.

27W   Professional knowledge and skills;

General skills: interdisciplinary skill, problem-solving, multi-perspective thinking, teamwork, self-learning, innovative skill, social sustainability development, practical skill;

Attitude: autonomy, self-motivated.

28W   Professional knowledge and skills;

General skills: system thinking, ambiguity tolerance, asking questions, solving sill-structured problems, applied skill, presentation skill, time management skill, collaborative skill, practical skill, communication skill, teamwork;

Attitude: self-motivated, self-reflect awareness, independence;

29W   Professional knowledge and skills;

General skills: interpersonal skill, employability, intercultural communication skill, adapt to change, oral presentation, creativity;

Attitude: autonomy, responsibility, positive attitude toward learning.

30W   Professional knowledge and skills;

General skills: self-regulation; ability to adapt the unfamiliar environment, sustainable

development;

Attitude: positive emotion, learning interest, autonomy, responsibility.

31W   Professional knowledge and skills;

General skills: creativity, problem-solving skill, interactive skill, employability, self-learning, teamwork;

Attitude: autonomy, responsibility, positive attitude toward learning.

32W   Professional knowledge and skills;

General skills: critical thinking, stimulation skill, interactive skill, collaborative skill, problem-solving skill, practical skill;

Attitude: positive attitude toward learning.

33W   Professional knowledge and skills;

General skills: self-decision, written skill, employability, practical skill, self-regulation;

Attitude: psychological needs, self-motivated, independence, positive attitude toward learning.

34W   Professional knowledge and skills;

General skills: communication skill, teamwork;

Attitude: self-motivated.

35W   Professional knowledge and skills;

General skills: adaptability, information feedback capability, communication skill, information gathering, digital skill, creativity;

Attitude: autonomy, positive attitude toward learning.

36W   Professional knowledge and skills;

General skills: employability, collaborative skill, teamwork, practical skill;

Attitude: learning interest, positive attitude toward learning, autonomy.

37W   Professional knowledge and skills;

General skills: sustainable development, judgement skill, information gathering skill, analytical skill, employability, ability to adapt to life change;

Attitude: social responsibility, ethic, civil responsibility, self value, solidarity.

38W   Professional knowledge and skills;

General skills: employability, adaptability, flexibility, critical thinking, interdisciplinary collaboration, communication skill, complex problem solving skill, systems thinking, entrepreneurship, teamwork, time management skill, lifelong learning;

Attitude: positive attitude toward learning, responsibility.

39W   Professional knowledge and skills;

General skills: collaborative skill, creativity, problem-solving skill, self-reflection, interactive skill;

Attitude: autonomy, awareness of collaboration and accountability, positive attitude toward learning, responsibility.

40W   Professional knowledge and skills;

General skills: questioning capability, ability to adapt the labour market, flexibility, adaptability, critical thinking, creativity, communication skill, lifelong skill, meta-cognition, decision making;

Attitude: autonomy, positive attitude in learning.

41W Professional knowledge and skills;
General skills: reflective thinking, collaborative skill;
Attitude: autonomy, self-motivated, learning interest, sense of belonging.

42W Professional knowledge and skills;
General skills: systematical thinking, anticipatory thinking, critical thinking, communication skill, innovative skill, emotional intelligence, participatory skill, interpersonal sill, collaborative skill, ;
Attitude: responsibility (values, ethics, reflection), empathy, tolerance for ambiguity.

43W Professional knowledge and skills;
General skills: lifelong learning, digital skill, communication skill, interdependence skill, individual accountability, interpersonal skill, information gathering;
Attitude: autonomy, responsible for learning, self-motivated.

44W Professional knowledge and skills;
General skills: interactive skill, digital skill, problem-solving;
Attitude: learning interest, positive attitude toward learning.

45W Professional knowledge and skills;
General skills: self-reflection;
Attitude: positive attitude toward learning, life and society.

46W Professional knowledge and skills;
General skills: problem-solving skill, analytical skill, leadership and management skill, creativity;
Attitude: active in learning, continuous desire to learn, responsibility.

47W Professional knowledge and skills;
General skills: appropriate expression of emotion, problem-solving skill, social interest;
Attitude: active in learning, strong interest, self-value.

48W Professional knowledge and skills;
Attitude: independence, self-motivated.

49W Professional knowledge and skills;
General skills: problem-solving skill, job performance, critical thinking, self-reflection;
Attitude: stable attitude, context-specific attitude construction.

50W Professional knowledge and skills;
General skills: problem-solving skill, critical thinking, oral and writing skill, applied skill, flexibility;
Attitude: active attitude toward learning, responsibility.

1C Professional knowledge and skills;
General skills: creativity, ability to express oneself, self-learning, self-management, teamwork and communication skills, critical thinking, self-reflection
Attitude: self-confidence, courage,

2C Professional knowledge and skills;
General skills: self-learning, teamwork and communication skills, critical thinking, creativity;
Attitude: responsibility, innovative spirit, self-esteem and self-confidence, and motivation in learning.

3C   Professional knowledge and skills;
      General skills: self-learning, teamwork and communication skills, critical thinking, life-long learning;
      Attitude: positive learning attitude; awareness of spreading Chinese culture, self-confidence, responsibility.

4C   Professional knowledge and skills;
      General skills: practical skills, innovative skill;
      Attitude: motivation in learning.

5C   Professional knowledge and skills;
      General skills: practical skills, communication skill, self-learning, teamwork, critical thinking;
      Attitude: motivation in learning, self-confidence.

6C   Professional knowledge and skills;
      General skills: communication skill, self-learning, teamwork, critical thinking, project management skill, practical skill, employability;
      Attitude: awareness of teamwork, motivation in learning.

7C   Professional knowledge and skills;
      General skills: practical skill, innovative skill, self-learning, teamwork;
      Attitude: awareness of active learning, self-confidence, courage.

8C   Professional knowledge and skills;
      General skills: practical skill, innovative skill;
      Attitude: awareness of innovation, awareness of active learning.

9C   Professional knowledge and skills;
      General skills: practical skill;
      Attitude: awareness of active learning.

10C   Professional knowledge and skills;
      General skills: innovative skill, creativity, entrepreneurial skill, practical skill, self-express;
      Attitude: subjective awareness, innovative spirit, self-value, team consciousness.

11C   Professional knowledge and skills;
      General skills: innovative skill, practical skill, employability, life-long learning, career development skill, communication skill;
      Attitude: innovative spirit, self-learning consciousness.

12C   Professional knowledge and skills;
      General skills: practical skill, employability, self-learning;
      Attitude: active in learning, positive perceptions.

13C   Professional knowledge and skills;
      General skills: practical skill, innovative skill, employability, self-learning;
      Attitude: active in learning.

14C   Professional knowledge and skills;
      General skills: self-learning, critical thinking, creativity, communication skill, teamwork and communication skill;
      Attitude: active in learning, self-value, career quality, self-confidence.

15C   Professional knowledge and skills;

General skills: self-learning, innovative learning; communication skill, ability to express, strain capacity, critical thinking;

Attitude: psychological quality, self-confidence, courage.

16C   Professional knowledge and skills;

General skills: self-learning, life-long learning, innovative skill, critical thinking, communication skill;

Attitude: self-motivated, active and positive attitude in learning, teamwork awareness.

17C   Professional knowledge and skills;

General skills: self-learning, self-regulation skill, innovative skill, critical thinking;

Attitude: self-efficacy, intrinsic value trust, active attitude in learning.

18C   Professional knowledge and skills;

General skills: self-learning;

Attitude: autonomous learning, active in learning, self-motivated, self-confidence, self-control, innovative spirit.

19C   Professional knowledge and skills;

General skills: teamwork, problem-solving, self-learning, social skill, critical thinking, communication skill, international horizon, ability to express, creativity, time management, employability;

Attitude: active in learning, self-motivated, responsibility.

20C   Professional knowledge and skills;

General skills: problem-solving, self-learning;

Attitude: active in learning, innovative spirit, autonomy.

21C   Professional knowledge and skills;

General skills: self-learning; practical skill, problem-solving, teamwork, communication skill, collaborative skill;

Attitude: active in learning, autonomy, responsibility.

22C   Professional knowledge and skills;

General skills: self-learning; innovative skill, autonomous learning, practical skill, independent thinking, problem solving, collaborative learning, creativity;

Attitude: active in learning, self-confidence, autonomy, learning interest.

23C   Professional knowledge and skills;

General skills: practical skill, autonomy learning, innovative skill, collaborative skill, creativity;

Attitude: teamwork consciousness, self-motivated.

24C   Professional knowledge and skills;

General skills: employability, independent thinking, autonomy learning, social skill;

Attitude: self-confidence, active in learning.

25C   Professional knowledge and skills;

General skills: creativity, practical skill, problem-solving skill, active thinking, collaborative skill, teamwork;

Attitude: self-motivated, initiative, autonomy learning.

26C   Professional knowledge and skills;

General skills: practice skill, innovative skill, lifelong learning, autonomy learning;

Attitude: active in learning, responsibility, innovative spirit.

27C Professional knowledge and skills;

 General skills: self learning, innovative skill, practical skill, critical thinking, problem solving, applied skill;

 Attitude: learning interest, respect for the spirit of science, patriotic spirit.

28C Professional knowledge and skills;

 General skills: problem solving, self-awareness, teamwork, information gathering, communication skill, dialectical thinking, Time management skill, oral presentation skill, written presentation skill;

 Attitude: learning interest, positive attitude in learning.

29C Professional knowledge and skills;

 General skills: self-learning, creativity, applied skill, practice skill, critical thinking;

 Attitude: a holistic view of quality, autonomy, soundness personality, independence, innovative spirit, active in learning.

30C Professional knowledge and skills;

 General skills: adapting to social need, creativity, self-learning, self-control;

 Attitude: proactive, autonomy, self-confidence.

31C Professional knowledge and skills;

 General skills: self-development, self-learning, self-control, self management, creativity, practical skill, critical thinking, problem solving, innovative skill;

 Attitude: proactive, autonomy, innovative spirit, broad vision, humanistic and scientific spirit.

32C Professional knowledge and skills;

 General skills: creativity, self-learning, practical skills, collaborative skill, teamwork, innovative skill;

 Attitude: learning interest, autonomy, pay more attention to students' emotions, values, and worldviews.

33C Professional knowledge and skills;

 General skills: problem-solving, adapting social needs, self-learning, critical thinking, self-regulation, self-management, self-development;

 Attitude: proactive in learning, learning interest.

34C Professional knowledge and skills;

 General skills: problem-solving, self-learning, communication skill, teamwork, collaborative skill, practical skill, creativity, critical thinking;

 Attitude: autonomy, proactive in learning, practical and rigorous science attitude, establish environmental awareness and green ideas.

35C Professional knowledge and skills;

 General skills: employability, adapting to social needs, innovative thinking, practical skill, self-learning;

 Attitude: autonomy, self-motivated, proactive in learning.

36C Professional knowledge and skills;

 General skills: creativity, problem-solving skill, analytical skills, logical thinking, abstract thinking, practical skill;

 Attitude: autonomy, initiative, creative awareness, innovative consciousness, engineering literacy.

| 37C | Professional knowledge and skills;
General skills: innovative skill, applied and practical skills;
Attitude: innovative consciousness. |
|---|---|
| 38C | Professional knowledge and skills;
General skills: practical skill, communication skill;
Attitude: self-confidence, active in learning, learning interest, self-motivated. |
| 39C | Professional knowledge and skills;
General skills: self-learning, teamwork, collaborative learning, information gathering, critical thinking, innovative skill, problem-solving skill, ability to generalize;
Attitude: collaborative spirit, self-confidence, active in learning, learning interest, awareness of independence, cultivating students' enterprising, responsible and strong will qualities. |
| 40C | Professional knowledge and skills;
General skills: communication skill, management and organizational skills, interpersonal skill, sustainability, problem-solving skill, practical skill, employability, self-cognition;
Attitude: ethics and compassion, learning interest, self-motivated, self-confidence. |
| 41C | Professional knowledge and skills;
General skills: employability, applied skill, practical skill, self-learning, problem-solving skill, independent thinking, innovative skill;
Attitude: active in learning. |
| 42C | Professional knowledge and skills;
General skills: self-learning, problem-solving skill, active expression;
Attitude: learning interest, active attitude in learning. |
| 43C | Professional knowledge and skills;
General skills: practical skill, innovative skill, self-learning, problem-solving skill, independent skill, teamwork, collaborative learning, analytical skill;
Attitude: learning interest, active attitude in learning, self-motivated. |
| 44C | Professional knowledge and skills;
General skills: practical skill, innovative skill, teamwork, collaborative skill, problem-solving skill, analytical skill, life-long learning;
Attitude: learning interest, self-motivated, positive attitude in learning, sound values and ideals. |
| 45C | Professional knowledge and skills;
General skills: self-learning; innovative skill, practical skill, independent thinking, problem-solving skill;
Attitude: academic awareness, innovative spirit, autonomy, active in learning. |

Table 28. Categorization of the influencing variables of students' competence development on the student-centered approach

Categorization	Articles	Number
Environment	1W, 3W, 4W, 6W, 8W, 9W, 12W, 17W, 19W, 20W, 22W, 25W, 26W, 28W, 31W, 33W, 36W, 38W, 41W, 43W, 44W, 46W, 47W, 48W, 49W, 2C, 4C,	47

	8C, 12C, 14C, 18C, 21C, 23C, 24C, 25C, 26C, 28C, 29C, 31C, 33C, 34C, 37C, 38C, 39C, 40C, 42C, 43C	
Teacher's emotion	21W, 30W, 36W, 45W, 47W, 8C, 12C, 18C, 20C, 39C, 45C	11
Teacher's belief	2W, 3W, 4W, 6W, 9W, 12W, 15W, 17W, 18W, 20W, 21W, 28W, 29W, 30W, 31W, 33W, 38W, 39W, 40W, 41W, 43W, 45W, 47W, 50W, 1C, 2C, 3C, 6C, 7C, 8C, 15C, 16C, 18C, 19C, 20C, 21C, 22C, 24C, 25C, 26C, 27C, 28C, 29C, 31C, 32C, 33C, 34C, 35C, 38C, 39C, 40C, 41C	52
Course material and content	1W, 10W, 11W, 12W, 17W, 18W, 20W, 24W, 29W, 34W, 39W, 43W, 44W, 45W, 50W, 1C, 3C, 4C, 7C, 8C, 9C, 11C, 12C, 14C, 15C, 16C, 19C, 21C, 23C, 24C, 26C, 27C, 33C, 34C, 36C, 39C, 43C, 45C	38
Students' motivation	1W, 6W, 8W, 13W, 17W, 18W, 19W, 20W, 21W, 27W, 29W, 30W, 33W, 35W, 36W, 37W, 38W, 39W, 40W, 41W, 43W, 46W, 48W, 1C, 2C, 3C, 7C, 9C, 12C, 14C, 15C, 16C, 18C, 19C, 22C, 25C, 26C, 28C, 33C, 34C, 35C, 39C, 40C, 43C	44
Students' belief	6W, 17W, 18W, 21W, 38W, 39W, 43W, 45W, 50W, 9C, 11C, 15C, 18C, 22C, 24C, 25C, 26C, 28C, 31C, 33C, 34C, 35C, 38C, 43C	24
Deep learning	1W, 6W, 7W, 15W, 16W, 17W, 21W, 29W, 30W, 36W, 39W, 40W, 41W, 46W, 49W, 14C, 18C, 21C, 26C, 34C, 38C, 40C, 42C, 43C, 45C	25
Activities	2W, 3W, 4W, 5W, 6W, 7W, 8W, 10W, 12W, 13W, 14W, 17W, 18W, 19W, 20W, 21W, 22W 23W, 24W, 26W, 27W, 28W, 29W, 31W, 32W, 33W, 34W, 35W, 36W, 37W, 38W, 39W, 40W, 41W, 42W, 43W, 45W, 46W, 48W, 49W, 1C, 2C, 3C, 5C, 6C, 7C, 8C, 9C, 10C, 11C, 12C, 13C, 14C, 15C, 16C, 17C, 19C, 20C, 21C, 22C, 23C, 24C, 25C, 26C, 27C, 28C, 29C, 30C, 32C, 33C, 34C, 35C, 36C, 37C, 38C, 39C, 40C, 41C, 42C, 43C, 44C, 45C	82
Assessment	4W, 6W, 7W, 8W, 10W, 12W, 13W, 14W, 16W, 17W, 18W, 19W, 20W, 21W, 22W, 23W, 24W, 25W, 26W, 27W, 28W, 30W, 31W, 32W, 33W, 34W, 35W, 36W, 37W, 38W, 39W, 40W, 41W, 43W, 45W, 46W, 48W, 49W, 50W, 1C, 2C, 3C, 5C, 6C, 7C, 8C, 9C, 10C, 12C, 13C, 16C, 18C, 19C, 20C, 21C, 23C, 24C, 25C, 26C, 27C, 28C, 29C, 30C, 32C, 33C, 34C, 35C, 36C, 39C, 40C, 41C, 44C, 45C	73
Teacher's competence	6W, 9W, 12W, 15W, 21W, 24W, 28W, 36W, 38W, 43W, 44W, 45W, 46W, 13C, 15C, 18C, 21C, 26C,	24

| | 34C, 35C, 37C, 41C, 43C, 45C | |
| Policy support by institution | 28W, 37W, 2C, 6C, 8C, 26C, 28C, 29C, 30C, 31C, 37C, 43C, 45C | 13 |

Factors promoting the development of students' competence. We analyzed the documental corpus in terms of how the student-centered approach promotes students' competence development. As presented in Table 28, in higher education, students' competence appears to be associated with many dimensions of the student-centered approach, particularly activities (82 articles), assessment (73), teacher's belief (52), and environment (47), consistent with Biggs's (2011) findings for effective teaching and learning. In the following, we will examine each dimension in turn as it relates to the development of students' competence.

Environment and students' competence development. The culture of the student-centered learning environment is distinct from that of conventional teaching not only in terms of the instructors' behavior and lesson structure, but also in terms of the elicited learning activities, the quality of the learning tasks, the participation structures, discourse practices, and competence development. For instance, opportunities for independent problem-solving, self-regulated learning, and adaptive support are quality attributes that can be observed in student-centered environments (Levesque-Bristol et al., 2020; Pauli et al., 2007). More specifically, students make sense of what they learn in the student-centered atmosphere, where they are stimulated to develop reflective and critical thinking, and where a sense of responsibility comes to the fore (Serin, 2018). This type of responsibility is particularly pronounced in the open learning environment, which encourages self-directed learning by guiding and supporting students while they participate in difficult, complex, frequently ill-structured, open-ended challenges (Hannafin, 2014).

Moreover, the student-centered environment prioritizes the students' experiences. It intends to offer them "opportunities to develop the deep understanding of the material, internalize it, comprehend the nature of knowledge development, and develop complex cognitive maps that connect bodies of knowledge and understandings" (Richardson, 2003, p. 1628). It implies that such a student-centered learning environment can drive knowledge construction and comprehension, promote self-motivated learning, and contribute to developing higher-order abilities (Baeten et al., 2016; Cho et al., 2021).

Academics also proposed that the features and cultures of the learning environment constructed by teachers are equally essential for student development. It is commonly held that learning is facilitated in a supportive, respectful, positive, and safe environment where students' diversity is accommodated and participation is encouraged, aiding in students' learning and development (Lancaster, 2017; Zhao et al., 2018). For example, learning is promoted in a safe climate with minimal external criticisms and perceived risks to students' self-image, providing opportunities for students' engagement (Fisette, 2010). The positive learning atmosphere also fostered student development through interaction and collaboration with each other (Soubra et al., 2022).

Teacher's emotion and students' competence development. Scholars highlight the significance of teachers' emotional competence in developing and maintaining supportive teacher-student relationships and effective classroom management (e.g., Jennings & Greenberg, 2009; Rapanta, 2021). These factors contribute to creating a classroom environment that is more conducive to learning and promotes positive developmental outcomes among students. Deng and

Xin (2007) identified six emotional competences teachers require to develop the "student-centered" approach, including self-confidence, self-control, integrity, innovation, responsibility, and empathy. By creating a favorable climate, teachers' emotional competence significantly changes students' attitudes toward learning and improves the quality of their learning.

The emotional competence of educators has ramifications for university reformation as well. Numerous university reformers contend – and research supports this perspective – that students learn better when they are happy, respected, and feel cared for (Noddings, 2015), feel a connection to their university, and have faith that the institution's personnel have their best interests at heart (Bryk & Schneider, 2002). Moreover, students experiencing positive emotions will absorb more information, and the resulting boost of positivity in the classroom aids in developing social-emotional competence (Dewaele & Li, 2021; Donahue-Keegan et al., 2019).

Teacher's belief and students' competence development. In the traditional approach to teaching and learning, which has dominated much of the world's education for decades, teachers are at the heart of the teaching process, and students follow their directions. In the student-centered approach, however, the teacher's role shifts from imparting information to facilitating students' learning through discovery, inquiry, and problem-solving (Mostrom & Blumberg, 2012; Wright, 2011), creating a positive environment for student expression and acting as guides, facilitators, initiators, and navigators for their students (Keiler, 2018; Tamim & Grant, 2013). The instructor and students are collaborators and co-creators of the learning experience, with the teacher's attitudinal qualities being a major determining the quality of learning (Muganga & Ssenkusu, 2019; Pedersen & Liu, 2003).

In student-centered ideology, teachers are not authority figures, but rather ordinary people on an equal footing with students (Lou & Restall, 2020). This means that the relationship between teachers and students is one of harmony and parity. Besides, teachers accept and value students' personalities, appreciating their viewpoints, catering to individual differences and demands, and empowering students to take responsibility for their learning (Biggs, 2011; Yang & Tang, 2021). Moreover, teachers' backgrounds and experiences were found to have significantly impacted their beliefs, namely, their schooling experience, experience as a learner and user, and teaching experience (Keiler, 2018). Whether explicit or implicit, teachers' beliefs and assumptions about education, students, teaching, and learning will translate into a core philosophy and culture affecting their behaviors and practices in the classroom (McCombs & Whisler, 1997). Thus, teacher's belief is crucial in the student-centered approach related to their practice, role, relationship, and authority, promoting student initiatives and competence development.

Course material and content and students' competence development. Content and materials should have a dual function as a repository of knowledge and a medium to develop skills. Some experts point out that teaching students' genuine comprehension and ability development is more important than covering the content, and that it is crucial to use textbooks and resources flexibly, adapting to suit students' pace and requirements, adjusting as necessary selectively (e.g., Lapitan et al., 2021; Lou & Restall, 2020; Nilson, 2016). In this sense, rather than teaching the text page-by-page, the teacher filtered and synthesized the content and materials in order to teach students skills and foster their competence. Accordingly, when the material is handpicked to be coherent throughout the course, the students have the potential to see connections between previously studied and current material, associate new ideas to real-world issues, and view the task from a broader point, which is helpful for constructing new knowledge (Bayram-Jacobs et al.,

2019; Trigwell & Prosser, 1991).

Furthermore, the course content and materials can stimulate students' active learning. Studies suggested that the student-centered approach was prompted by flexible content delivery and learning strategies, and student learning requirements were met (Archambault et al., 2022; Cornelius & Gordon, 2008). Zhang et al. (2022) demonstrated that teachers must carefully select the materials and contents in accordance with the characteristics of their majors, such as continuously enriching content with the latest domestic and international achievements and teachers' scientific research as examples, actively creating an open climate to guide students' active learning and facilitate students' interest in learning. Thus, university instructors should "employ" course content and materials, not just as an end but as a way of assisting students in learning how to learn and develop students' competence.

Student's motivation and students' competence development. Numerous academics stress the importance of motivation and posit that it is one of the determinant factors in educational achievement, particularly intrinsic motivation (e.g., Ali, 2019; Mart, 2013, p. 338; Serin, 2018). Self-determination theory provides a crucial framework for comprehending the impact of autonomy during learning (Lee & Hannafin, 2016; Levesque-Bristol et al., 2020). Ryan and Deci (2000) claimed that self-motivated students endeavor to improve their skills since they enjoy the activity itself. Intrinsically driven activities are those that individuals would pursue even in the lack of externally imposed pressure because they find them intriguing. For instance, they type an essay because they are proud of their work rather than want others to admire or approve it (Thamraksa, 2003). Thus, students are more likely to set objectives to comprehend a task, learn new knowledge, and develop their skills when intrinsically motivated.

On the contrary, when individuals are extrinsically driven, they act according to external demands instead of their perception of the worth of learning (Deci & Ryan, 2000). Extrinsically-motivated performance objectives stress competence in achieving defined outcomes (Sungur & Senler, 2010). When learning tasks require flexible, innovative, or spontaneous motivation for optimal performance, external forces may muddle the relationship between students' individual needs and results (Snow & Farr, 2021). In the student-centered approach, intrinsic and extrinsic motivation interactions affect students' learning and performance (Cho et al., 2021; Kassem, 2019).

In essence, self-determination theory assumes that individual autonomy improves volition, motivation, engagement, performance, persistence, and creativity (Deci & Ryan, 2000). On the one hand, when students handle complicated tasks requiring flexibility and innovation, intrinsic motivation improves performance more than externally-based objectives alone (Lee & Hannafin, 2016). As students make self-determination, they take increased responsibility for directing their learning, become more actively engaged, and acquire a more profound understanding (Hu, 2021; Li et al., 2020). Accordingly, the student-centered approach offers more chances to cultivate students' responsibility for their learning, boosting academic success and student autonomy. On the other hand, it is worth noting that extrinsic motivation may negatively impact students' motivation since it promotes them to engage in appropriate behavior solely for the reward (DeVries & Zan, 1994; Ryan & Deci, 2020). It is advised that teachers increase students' intrinsic motivation and develop students' understanding, skills, autonomy, and responsibility in student-centered classrooms (e.g., Hemmati & Aziz Malayeri, 2022; Rögele et al., 2022).

Students' belief and students' competence development. Students' belief is associated with

their learning behaviors and learning styles. When students perceive they are the center of the course, they tend to be willing to adapt the learning behaviors and strategies accordingly (Song et al., 2007). Studies claim that the successful transition toward the student-centered approach requires a mutual adaptation of students' and teachers' teaching and learning beliefs (Elen et al., 2007; Land et al., 2012; Manske, 2021). In other words, a unilateral change in belief is insufficient to adopt the student-centered approach. The course approaches, in turn, influence students' beliefs, expectations, learning strategies, outcomes (Hayat et al., 2020; Yang, 1999), and epistemologies (Sheppard & Gilbert, 1991). The student-centered approach provides students with the opportunity to strengthen their beliefs and take charge of their learning, as students with a sense of autonomy tend to become more active learners who actively process the information, explore the required knowledge through self-directed learning activities, and develop their skills, as opposed to passively listening to a lecture and memorizing (Wang, 2014; Zhao, 2021).

Deep learning and students' competence development. The student-centered approach can encourage a more in-depth approach to learning, hence enhancing students' competence (e.g., Wang & Zhang, 2019). Several studies utilizing pre- and post-test measurements of learning approaches, before and after experiencing the student-centered approach, have demonstrated that students' learning experiences from these teaching methods have strengthened their learning approaches (Baharin et al., 2018; Waters & Johnston, 2004). Furthermore, additional studies have supported that students who adopt deep learning approaches are more likely to have superior learning outcomes than those who embrace surface ones (Calvão et al., 2019; Herrmann et al., 2017). It has been observed that the student-centered approach, such as problem-based learning, drives students to learn for understanding and to construct meaning. In contrast, the teacher-centered approach results in shallow learning with less comprehension (Ali, 2019).

Other researches indicate that the perception of good instruction toward deep learning approaches is a stronger predictor of university learning outcomes (Guo, 2018; Lizzio et al., 2002). Students who utilize a deep learning approach concentrate on comprehensively understanding the content. Their inherent interest motivates them, and construction for meaning accompanies their proper task involvement. Some academics hold that the student-centered approach can promote students' fresh ways of thinking and learning, facilitate their personal development, make them more active, and strengthen their confidence and sense of responsibility (Hu, 2021; Osman et al., 2015). In contrast, students who opt for a surface approach are influenced by a fear of failure, a view of avoiding difficulties, and a desire to exert minimal effort. Thus, their learning processes are restricted to selective remembering and limited in developing their competence (Biggs, 2011).

Course activities and students' competence development. The student-centered approach is at the forefront of the development of learning approaches in which students' activities are significant indicators of the learning process and outcome quality (Zohrabi, et al., 2012). There is a shift of focus from teaching to learning, which is as an active educational activity for a student. According to Wohlfarth et al. (2008), teachers eschewed lecture notes and PowerPoint presentations in favor of more active and engaging activities in a student-centered classroom. This perspective is shared by numerous theorists (e.g., Ahmed, 2013; Sandybayev, 2020). The student-centered approach considers students' specific features and requirements, emphasizes learning activities and assessment, and stresses increasing individual responsibility for learning outcomes. In this regard, the teacher guides students, facilitates their activities, and encourages competence development (Jones, 2007; Khoury, 2022).

Furthermore, some studies revealed that courses with student-centered activities positively affected students' knowledge and skills development (e.g., Liu & Zhu, 2019; Tunagür et al., 2021; Rodrigue-Paz et al., 2022). The student-centered approach requires students to actively construct their knowledge through authentic experiences and offer them activities and assessments of their chosen (Freire, 2018). In this mode of instruction, teachers provide students with more opportunities and activities to develop the abilities necessary to uncover their own knowledge (Wright, 2011; Sukackė et al., 2022). These skills generally correspond to the real-world transfer skills needed by today's knowledge-based or innovative economy, such as problem-solving, critical thinking, cooperation, innovation, and creativity (Scoot, 2015). These competences are the consequence of students' genuine participation in their education (Freire, 2018).

Course assessment and students' competence development. Assessment is crucial for student progress in the student-centered course, particularly in formative assessment, with various assessment strategies such as self-assessment, peer review, and ongoing feedback. There is substantial evidence that feedback has indisputable effects that contribute to enhanced understanding and acquired intended learning outcomes (Dakovic & Zhang, 2020; Hattie & Timperley, 2007). Specifically, teachers encourage students to learn from each other by providing proper and constructive feedback (Nicol & Macfarlane-Dick, 2006), which stimulates students' engagement, maintain their interest, and further enhances students' competence in various ways of areas (Wu et al., 2019).

In addition, many researchers believe that assessment should be used both for and to facilitate learning, and that teachers should routinely monitor students' learning in order to provide feedback on individual progress and adjust instruction accordingly (Deeley, 2018; Jin et al., 2019). Therefore, teachers should move their focus from lecturing to assessing (both summative and formative), assisting in diagnosing students' prior knowledge, gauging students' understanding throughout the learning experience and guiding instruction, providing appropriate feedback to each student, and assessing their outcomes at the ending of the course (Kazempour, 2009; Rico, 2019). Proper implementation of assessment activities has the potential to enhance students' self-regulation and self-reflection (Yan et al., 2020). This shift in emphasis indicates a radical departure from historical practice. Overall, both assessment and curriculum design are conditioned upon the implementation of learning outcomes (EU, 2015). However, implementing formative assessment in student-centered courses remains challenging, such as teacher's time commitment, and assessment of students' competence (Alves et al., 2019).

Teacher's competence and students' competence development. Teacher professional development is gaining popularity as a crucial means of supporting the increasingly complex abilities students acquire to succeed in the 21st century (Darling-Hammond et al., 2017). To build students' competence such a deep understanding of complex topics, critical thinking, problem-solving, effective communication and teamwork, and autonomy, advanced and effective forms of instruction are required. In turn, teachers need effective professional development to learn and improve the instructional practices necessary to develop students' abilities (Feiman-Nemser, 2001; Feng et al., 2017). For example, during the pandemic, teachers' digital competences are crucial to the quality of student learning in the course (Nez-Canal et al., 2022).

Many studies showed that competent teachers are more likely to impact student engagement and facilitate student learning (e.g., Švejdarová, 2020; Yuan et al., 2016). As Welmilla (2020)

claimed, university students prefer to take the student-centered approach, where it is possible if only teachers are ready and capable of taking into account students' needs, interests, and viewpoints on adaptation into their instructional methods. Students express a desire for educators to have the breadth of knowledge necessary to help them ponder on subjects beyond those covered in textbooks and examined on exams (Tam et al., 2009). Therefore, professional development is significant for teachers to be competent in instruction, promoting students' better understanding and developing their competences.

Policy support by institutions and students' competence development. In studies on the student-centered approach and students' competence development, the policy support by institutions is generally mentioned in the discussion and implication sections as the recommendations. Due to the fact that the student-centered approach is a paradigm shift encompassing multiple dimensions, studies have put forward some suggestions at the institutional level to embrace the student-centered approach vigorously. For example (Darling-Hammond et al., 2017; Feng & Ding, 2019; Marton et al. 2019),

(1) University policymakers could employ standards for providing professional development guidance to instructors, including the design, assessment, and funding of professional learning.

(2) The university's Faculty Development Center could organize workshops, seminars, and other activities connected to teaching and learning to help teachers enhance their professional competence.

(3) The university should place greater emphasis on fostering a student-centered culture and a supportive atmosphere.

(4) Policymakers and administrators could assess and revamp the utilization of time and schedules in order to expand opportunities for professional development and cooperation, such as engaging in professional learning communities, peer coaching and classroom observations, and collaborative planning.

(5) Using data from staff surveys, universities could undertake periodical needs assessments to determine the areas of professional development most sought and required by educators. These sources of information can help ensure that professional development is not detached from practice and supports the areas of knowledge and skills that educators desire to cultivate, thereby, the course content is evolved with the times.

All in all, evidence associating the student-centered approach with students' competence development has continued to emerge in the past two decades. As a widely-embraced endeavor in the teaching community, the student-centered approach prompts effective teaching and learning, since the student-centered approach stimulates students' desire to communicate and motivation to learn, and significantly increases interaction and practice opportunities, all of which are vital factors that affect the rate and success of learning and development. Besides, based on the above systematic review, there are additional factors that foster the development of students' competence, including the following: environment, teacher's and student's beliefs, teacher emotion, content and materials, activities, assessment, teacher competence, and institutional support. Defining these factors not only for a better understanding of the relationship between student-centered approach and students' competence development but also lays the groundwork for constructing the survey instrument for empirical research.

Chapter 4 Methodologies and methods

This chapter mainly states some considerations regarding the research design in terms of empirical research, which will be divided into four sections. The first section presents the research methodology. Subsequently, the following is the research design. Specifically, this section will provide a general picture concerning the research procedures, participants, and instrument design. A detailed description of the quantitative and qualitative research instruments will be provided. Finally, the quantitative research instrument's reliability and validity will be examined.

4.1 Case studies with mixed methods research

This study adopted case studies with mixed methods. Both case studies and mixed methods are popular research and evaluation approaches. However, case studies and mixed methods research are not separate entities; instead, the boundary between them is permeable and fluid, allowing each to either support or lead in a research endeavor (Carolan et al., 2016). As such, this permeability or fluidity requires a deeper understanding of the case studies with mixed methods.

On the one hand, mixed methods research integrates qualitative and quantitative research in a single study or series of closely associated studies by collecting, analyzing, and combining qualitative and quantitative data (Creswell, 2015). As a means of addressing the paradigm conflict, the mixed methods paradigm – in which quantitative and qualitative methods are seen to complement each other – has been commonly used as its pragmatism (Dattilio et al., 2010). Evolving as a third research paradigm (Johnson & Onwueguzie, 2004) or research community (Teddlie & Tashakorrie, 2009), mixed methods support not just the compatibility between research methods but also the complementarity between epistemic systems. This enables investigators to capitalize on the strong points of each approach in terms of providing evidence pertinent to various issues and questions. At the same time, the shortcomings of a single method regarding distortions or omissions are mitigated or remedied by evidence from the complementary approach. Thus, the use of mixed methods is increasing globally, as evidenced by the growing number of mixed methods dissertations (McKim, 2017) and funded mixed methods research (Coyle et al., 2018), two critical leading indicators of its adoption.

On the other hand, the case study is a widely used, albeit sometimes undervalued, method of research and evaluation. Researchers have employed the case study across numerous fields, which are too many to list here but encompass education (Harland, 2014). The case study is regarded as a separate and all-encompassing method with its own research design. Simply put, a case study is "an empirical enquiry that analyzes a contemporary phenomena (the 'case') in depth and in its actual setting" (Yin, 2014, p. 16). Yin (2014) held that the essence of the scientific method is not experimenting per such, but rather the strategy denoted by the expression "plausible rival hypotheses." This strategy may begin the resolution of a puzzle with evidence or with a hypothesis. Accordingly, at the beginning of this empirical research, we put forward a hypothesis – there is a relationship between the student-centered approach and students' competence development. For this, the researcher must consider further which case study types are appropriate.

The case study involves the examination of one or more real-world cases to capture their complexity and specifics (Yin, 2014). In other words, there are various types of case study, which also brings design choices as summarized in Table 29. Given that the case or case selection depends on the research questions and purpose, case studies were chosen for this study. Specifically, this study examined the relationship between the student-centered approach and

students' competence development by selecting the Chinese/Italy courses as cases. The focus of the cases was not on the courses themselves but on understanding the relationship, hence the instrumental case study approach. Based on it, the researcher selected multiple cases for cross-national case comparison. Finally, with respect to the relationship between the student-centered approach and students' competence development required to data collecting, analysis, and understanding from multiple origins, the embedded case study is suitable for this study. Additionally, in the case studies, cases are boundaries of time and activity, and the researcher collected detailed information utilizing various data collection procedures over a continuous time (Creswell, 2015, p.14). Yin (2009) suggested that researchers regard multiple case studies as multiple experiments and adhere to the "replication logic" when undertaking multiple case studies since this will enhance the findings more convincingly. Overall, instrumental, multiple, and embedded case studies were ultimately employed.

Table 29. Case study design choices (Guetterman & Fetters, 2018; Stake, 1995; Yin, 2014)

Design feature	Description of option
Case study purpose	
Instrumental case study	Case represents a phenomenon of interest
Intrinsic case study	Case represents a unique of important situation, making the case itself of primary interest
Number of cases	
Single case study	Select relevant critical case, unusual case, common case, revelatory case, or longitudinal case
Multiple case study	Select case to compare and contrast
Units of analysis	
Holistic	Global-level unit of analysis (e.g., a program, a school, a clinic). Used when subunits cannot be identified or are not relevant to research questions. More abstract analysis.
Embedded	Units of analysis come from multiple levels. Allows detailed understanding of phenomena. Used when understanding needed from multiple levels.

Combining case studies with mixed methods. Case studies have a tradition of collecting several forms of data – qualitative and quantitative – to yield new inferences and a more comprehensive understanding of the cases. Case studies can combine well with mixed methods provided it is proceeded systematically and with consideration. Case study professionals have advocated combining qualitative and quantitative research methods when examining cases (Yin, 2014). Moreover, specialists in mixed methods have suggested the mixed methods case study as a sophisticated design (Creswell & Clark, 2018). As such, integrating case studies and mixed methods has been becoming more prevalent among researchers. As Yin (2014, p. 67) claimed, case studies with mixed methods support you to address broader or more complex research questions than case studies alone.

All in all, the researcher employed the parent case studies, including a nested mixed methods design (Guetterman & Fetters, 2018), namely, cases studies with mixed methods, in which the quantitative and qualitative data collection, results, and integration are used to provide in-depth

evidence for cases or develop cases for comparative analysis (Creswell & Clarke, 2018, p. 116).

4.2 Empirical research design: Procedures, participants, and instruments design

In mixed methods, there are three different forms of design: explanatory sequential design, exploratory sequential design, and convergent design. This research will merge qualitative and quantitative data to explore and interpret the issues, including "what is the student-centered approach," "what factors play a role," "how the factors work," and so forth. For this reason, the convergent design (Figure 14) case studies are taken into account. Explicitly, qualitative content analysis is a classic procedure for conducting and analyzing a wide variety of textual data (Flick, 2009; Kohlbacher, 2006), and it is helpful for answering "how" and "why" questions, which are more explanatory, whereas quantitative content analyses contribute to answering "what" questions (Given, 2008). Based on the above mentioned, convergence design provides the possibility to combine qualitative and quantitative data gathering and analysis in case studies, to interpret the research question upon the interrelationships between these data points, and to obtain a deeper understanding through case studies. And given that this study adapted the case studies with mixed methods, the researcher will introduce the research procedure and participants in detail in the following.
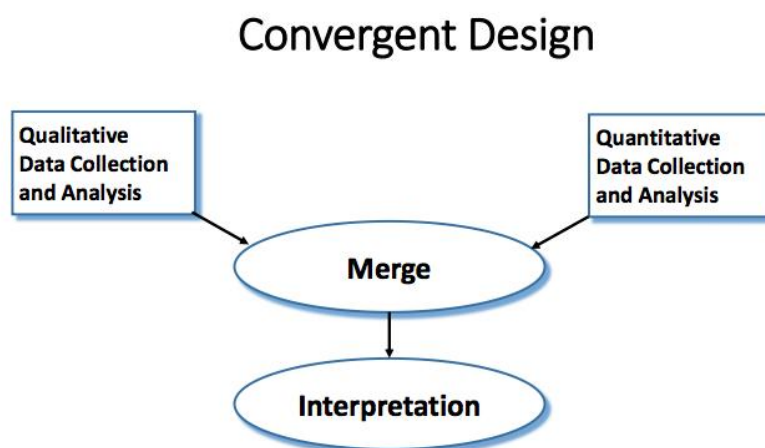
Figure 14. Convergent design of case studies with mixed methods (Cook & Kamalodeen, 2019)

According to the background and question of this study, the beginning point is that, in theory, every course must be student-centered since the Bologna Process has been in effect for two decades. Driven by the Bologna Process, the student-centered approach is a priority, and the teachers have seemed to make some effort to change teaching and learning. However, it is difficult to change the teachers' concepts in practice. Because even when a teacher completes a questionnaire, they can claim to have altered numerous aspects, including the writing and evaluation of learning outcomes. In actuality, they may not change anything at all. Consequently, this study is concerned with how teachers put the student-centered approach into reality, develop students' competence, and examine how teaching and learning activities can truly help students advance.

The first step is identifying the course, the teacher, and the students as the case studies

sample. Since the current study's purpose is to understand better the relationship between the student-centered approach and the development of students' competence from the perspective of stakeholders, it is crucial to select samples from which the most can be learned. Hence, the purposive sampling method (Cohen et al., 2018) was employed, and the purposive samples are data-rich cases "from which one can learn a great deal about issues of central relevance to the goal of the research" (Patton, 2002, p. 230). Considering the student-centered approach is highly dependent on the teacher's philosophy, which is challenging to alter. In accordance with these principles, we first choose the sample teacher participants and then the courses.

Therefore, we prefer to collaborate with teachers that have experience with teaching and learning. They are knowledgeable in curriculum design and employ the student-centered approach throughout the course, to be more appropriate for this study. As such, combined with the research theme, the cases comply with the criteria for case selection as follows:

(a) Teachers with experience;

(b) Teachers with teaching competence trained;

(c) Teachers with the pedagogical background;

(d) The course with the syllabus or intended learning outcomes;

(e) Both teachers and students agree to participate in our research.

After inviting and negotiating with the teacher and students to request cooperation, this study confirmed the specific cases. Two bachelor's degree courses and two master's degree courses at the University of Padova in Italy, as well as four bachelor's degree courses at Guangzhou University in China, were chosen. There are eight case studies in total. Such the selection has also reflected the researcher's individual reasons. As a doctoral student financed by the School of Education at Guangzhou University who is also pursuing a doctorate at the University of Padova, the researcher expects that this study will contribute to making some implications and improving teaching and learning in both departments. As a result, the courses in Education discipline at these two universities will serve as cases.

The second step, following the confirmation of the cases, is to create quantitative instruments for data collection from students. There are two questionnaires for students. At the beginning of the course, the first questionnaire was handed out to test the intended learning outcomes designed by the teacher, and to obtain data about their competence gap after the course with the second questionnaire. Both two questionnaires are based on students' self-assessments. Compared to the initial questionnaire, the latter questionnaire is the deeper one, not only measuring the learning outcomes, but also the teaching and learning environment, course content and materials, activities, assessments, and others, with some open questions.

Constructing the tool for research is not easy stuff. The researcher started by creating a framework based on a systematic literature review, as mentioned in Chapter 3.3. It means that the researcher has to analyze and synthesize this previous information, identifying the dimensions and sub-dimensions from the literature review, thus laying the foundation for the data collection and analysis (Miles et al., 2018). Theoretical construction can help collect data more reasonably in case studies. If the theory is well constructed, it will also help you summarize and generalize the cases.

Subsequently, following the path of "problem-indicators-questions," the researcher decomposed the research problem into many dimensions and sub-dimensions based on the literature review and identified some related indicators through deep analysis of each associated

article (McGuirk & O'Neill, 2016, p. 248). Each indicator could translate into corresponding questions. In this way, it is not simply to define some questions, but can return to the research subject and make the connection between the research problem, the dimension/indicator, and the specific question clear. Using this strategy could avoid occasionally asking meaningless inquiries or forgetting something more essential to assist us in staying focused on the research topic. To yield more reliable findings, the researcher set the rating scale to 1 to 4; excluding "not sure" is more efficient.

Moreover, since the scale is planned to be filled out by students within the context of the sample course, some dimensions indicated in the literature review, such as teacher professional development and institution-supported policies, will remain in the interview portion for teachers. As a result, for collecting the quantitative and qualitative data from students, the second questionnaire was semi-structured, designed into two dimensions (comprising 12 sub-dimensions) related to the research topic, as displayed in Appendix B.

The last step is to conduct an in-depth interview with teachers to collect qualitative data. The interview offers an ideal platform for researchers to acquire an in-depth understanding of a specific phenomenon or actual scenario, examine a person's experience and the meaning they attribute to that experience, and investigate the person's interpretation of that experience (Seidman, 2006). The researcher designed the interview outline based on the results of the semi-structured questionnaire. To investigate teachers' personal understanding of the student-centered approach and their experience in dealing with the student-centered practice to help students' competence development in two different cultural contexts, which is a complex and context-based phenomenon. Therefore, considering the nature of the current research, the unstructured interview was employed to collect data on Italian and Chinese teachers, as it allows the interviewees to express themselves freely, with the premise that the researcher still steers the course of the dialogue surrounding the study issue based on a research design.

As Mears (2012) reminded readers, an effective interview requires a well-designed interview outline to ensure that you cover the major topics you would like the interviewee to discuss. In light of the research objectives and questions, as well as the findings from the quantitative and qualitative data collected by the students, six main interview questions (as shown in Appendix C) were developed to guide the interview. Nevertheless, this is merely a guideline, and additional related questions will be discussed during the interview to acquire rich data. Ultimately, based on the findings of comparative analysis of the case studies, if two or more empirical results confirm the same hypothesis, the research conclusion is more persuasive.

In summary, the two research instruments were interrelated and established an evidence chain whereby the collected data corroborated each other. In other words, the results obtained from the questionnaire matched the results obtained from the interview to enhance and confirm the hypothesis of the relationship.

4.3 Quantitative research instrument: Semi-structured questionnaire for students

Before administering a formal test, the questionnaire must be evaluated for its reliability and validity. The questionnaire was given twice as the pre-test. The initial distribution of 200 web-based questionnaires for exploratory factor analysis yielded 186 valid responses. The second time 200 valid questionnaires were returned after 220 questionnaires were circulated for reliability and validity (confirmatory factor analysis). For data analysis, SPSS 26.0 statistical software was

utilized.

4.3.1 Reliability of the questionnaire

The questionnaire is designed for the cross-cultural study of the relationship between the student-centered approach and students' competence development in higher education by the University of Padova (Italy) and Guangzhou University (China). To measure the questionnaire's reliability and validity, 200 valid participants (100 Italian students, 100 Chinese students, 33 boys, 167 girls, 145 for bachelor degree, 55 for master degree, average age 23.17 years old, SD 6.35, range 18–55) were taken part in. By adopting purposive sampling, participants belonged to the education or pedagogy background. Consent was obtained from the course teachers and students, and students completed the questionnaires voluntarily after scheduled courses.

The questionnaire includes at least 56 items (items on learning outcomes differ from each course) scored on a 4-point scale, and it is more effective to exclude "not sure." It yields two dimensions and twelve sub-dimensions: (1) the student-centered approach dimension includes environment, teacher's emotion, teachers' belief, material and content, students' motivation, students' belief, deep learning, activities, and assessment; (2) the students' competence development dimension comprehends self-assessment of learning outcomes, self-assessment of general skills and self-assessment of attitude. And Each sub-dimension comprises several indicators toward specific questions. The translation of the questionnaire into Italian was carried out following the guidelines developed by the International Test Commission for back translations by the researcher's supervisor, who is familiar with the study and the Italian context (Van de Vijer & Hambleton, 1996). However, besides linguistic equivalence, cultural and metric equivalence was ensured. Referring to cultural equivalence, students reported no difficulties in understanding the items on the scale.

Reliability is the extent to which a questionnaire, test, observation, or measurement procedure produces the same results on repeated trials (Bolarinwa, 2015). In other words, it is the stability or consistency of scores over time or across raters (Mohajan, 2017). This questionnaire presented good properties with acceptable factor structure and Cronbach alphas ranging from 0.78 to 0.96 (see Table 30 for details), indicating that the internal consistency reliability of each dimension is suitable. And the total value is 0.96, proving that with the results, the reliability of this questionnaire is good.

Table 30. Internal consistency (Cronbach's alpha) and confidence interval for dimensions in the sample (N = 200)

Dimensions	M	SD	a	95% C.I.
Student-centered approach	146.20	14.56	.96	.53–.75
1. Environment (6 items)	21.77	5.70	.90	.67–.78
2. Teacher's emotion (3 items)	10.63	1.50	.83	.63–.76
3. Teacher's belief (5 items)	17.70	2.16	.90	.69–.82
4. Material and content (6 items)	20.92	2.53	.88	.62–.75
5. Students' motivation (5 items)	16.77	2.34	.86	.57–.74
6. Students' belief (3 items)	9.10	1.75	.81	.62–.71
7. Deep learning (4 items)	12.54	2.11	.83	.62–.72
8. Activities (8 items)	26.67	3.45	.89	.58–.76

9. Assessment (3 items)	10.13	1.41	.78	.57–.69
Students' competence development	47.39	5.89	.92	.59–.77
1. Self assessment of learning outcomes (at least 6 items, depend on each course)	18.68	1.35	.90	.69–.75
2. Self assessment of general skills (5 items)	15.98	2.38	.86	.56–.77
3. Self assessment of attitude (4 items)	12.73	2.16	.88	.67–.83

4.3.2 Validity of the questionnaire

A century-old set of techniques, factor analysis, identifies the structure/dimensionality of observable data and reveals the underlying constructs that give rise to observed phenomena. These techniques investigate clusters of inter-correlated variables, which are referred to as "factors" or "latent variables."

Exploratory factor analysis. First, exploratory factor analysis was conducted on the 186 valid samples collected to test the validity of the questionnaire. Regarding the variable student-centered approach, using principal component analysis and Promax orthogonal rotation, the results showed that the KMO value was 0.907 ($p < 0.001$), indicating that the requirements for further factor analysis were met. From the scree plot, it can be found that nine factors with characteristic roots more significant than one, with a cumulative variance, are explained as 68.773%. After removing invalid question items, the results of the exploratory factor analysis resulted in a 43-item, 9-factor scale. The results of the item loadings and factor structure of the scale are shown in Table 31.

Table 31. Exploratory factor analysis for student-centered approach variables in the questionnaire

Items	Factors								
	1	2	3	4	5	6	7	8	9
Environment1	0.759								
Environment2	0.659								
Environment3	0.759								
Environment4	0.777								
Environment5	0.689								
Environment6	0.552								
Teacher's belief1		0.713							
Teacher's belief2		0.758							
Teacher's belief3		0.744							
Teacher's belief4		0.737							
Teacher's belief5		0.707							
Material1			0.523						
Material2			0.786						
Material3			0.754						
Content1			0.698						
Content2			0.676						

Content3	0.622			
Deep learning1	0.682			
Deep learning2	0.704			
Deep learning3	0.784			
Deep learning4	0.724			
Students' motivation1		0.783		
Students' motivation2		0.735		
Students' motivation3		0.787		
Students' motivation4		0.785		
Students' motivation5		0.572		
Activities1			0.504	
Activities2			0.502	
Activities3			0.623	
Activities4			0.588	
Activities5			0.661	
Activities6			0.689	
Activities7			0.747	
Activities8			0.732	
Teacher's emotion1				0.603
Teacher's emotion2				0.706
Teacher's emotion3				0.709
Students' belief1				0.854
Students' belief2				0.817
Students' belief3				0.808
Assessment1				0.515
Assessment2				0.747
Assessment3				0.755

Following this path, we still adopted principal component analysis and Promax orthogonal rotation to test the variable students' competence development in the questionnaire. The results demonstrated that the KMO value was 0.818 (p < 0.001), suggesting that further factor analysis could be conducted. The scree plot showed that three components explain a cumulative variance of 65.897% with characteristic roots greater than one. The exploratory factor analysis ultimately led to the development of a 15-item, 3-factor scale. The results of the item loadings and factor structure of the scale are displayed in Table 32.

Confirmatory factor analysis. The validity of a questionnaire is determined by analyzing whether the questionnaire measures what it is intended to measure. Generally, confirmatory factor analysis is used to verify the factor structure of a set of observed variables. It also allows the researcher to test the hypothesis that a relationship exists between observed variables and their underlying latent constructs. To prove the validity of the questionnaire, the researcher conducted the test for factor structure (Table 33), convergent validity (Table 34), and discriminant validity (Table 35 and 36) separately.

The questionnaire presented good properties with the factor structure. For each measurement relationship, the absolute values of the standardized load coefficients are greater than 0.6 and are

significant (as shown in Table 33), meaning there is a good measurement relationship.

Table 32. Exploratory factor analysis for students' competence development variables in the questionnaire

Items	Factors		
	1	2	3
Learning outcomes1	0.851		
Learning outcomes2	0.864		
Learning outcomes3	0.857		
Learning outcomes4	0.793		
Learning outcomes5	0.787		
Learning outcomes6	0.802		
General skills1		0.727	
General skills2		0.787	
General skills3		0.744	
General skills4		0.799	
General skills5		0.801	
Attitude1			0.836
Attitude2			0.816
Attitude3			0.797
Attitude4			0.773

Twelve factors and 58 question items were subjected to confirmatory factor analysis. As seen in Table 34, the AVE values of the 12 factors are all greater than 0.5, and the CR values are all higher than 0.7, implying that the examined questionnaire has a high degree of convergent validity.

The maximum of shared squared variance (MSV) and the average of shared squared variance (ASV) are two indicators that can be used to determine discriminant validity. Typically, discriminant validity is indicated when both MSV and ASV values are less than the AVE value (Cohen et al., 2005; Sürücü & Maslakc, 2020). As shown in Table 35, the MSV and ASV values for all factors are less than the AVE values, thus meaning that the questionnaire possesses discriminant validity. Moreover, all the factors are more significant than their maximum value of the absolute correlation coefficient value between factors, indicating that they have good discriminant validity (Zaiţ & Bertea, 2011). For instance, for Environment, the AVE square root value of 0.784 is more than the absolute correlation coefficient's maximum value of 0.626, indicating good discriminant validity. In short, as presented in Table 36, the blue numbers represent the AVE square root values, which for all factors are higher than the maximum value of the absolute correlation coefficient, confirming there is good discriminant validity.

Last but not least, the CFA results display model fits well with the data (χ^2/df = 1.69, CFI = 0.98, GFI = 0.92, SRMR = 0.02, RMSEA = 0.06). In summary, the questionnaire presented good properties with the factor structure, convergent validity, and discriminant validity. Each variable has a specific correlation with each other and has a certain degree of discrimination between each other, indicating that the scale has ideal validity. Therefore, after conducting several tests to

examine the reliability and validity of the measures, it was determined that they are suitable for use in this study.

Table 33. Factor structure of the questionnaire

Factor	Items	Unstandardized Coefficients	Standard Error	z (CR)	p	Standard Estimate
Environment	Item 1	1.000	-	-	-	0.823
Environment	Item 2	0.979	0.078	12.552	0.000	0.778
Environment	Item 3	1.020	0.076	13.358	0.000	0.813
Environment	Item 4	1.029	0.078	13.109	0.000	0.802
Environment	Item 5	0.954	0.079	12.097	0.000	0.758
Environment	Item 6	0.947	0.083	11.418	0.000	0.726
Emotion	Item 1	1.000	-	-	-	0.815
Emotion	Item 2	1.036	0.079	13.084	0.000	0.867
Emotion	Item 3	0.727	0.072	10.128	0.000	0.689
Teacher's belief	Item 1	1.000	-	-	-	0.719
Teacher's belief	Item 2	1.136	0.099	11.508	0.000	0.838
Teacher's belief	Item 3	1.176	0.097	12.135	0.000	0.886
Teacher's belief	Item 4	1.092	0.103	10.582	0.000	0.771
Teacher's belief	Item 5	1.074	0.101	10.686	0.000	0.779
Material and content	Item 1	1.000	-	-	-	0.679
Material and content	Item 2	1.119	0.112	9.973	0.000	0.790
Material and content	Item 3	1.118	0.114	9.797	0.000	0.773
Material and content	Item 4	1.202	0.120	10.029	0.000	0.795
Material and content	Item 5	1.102	0.118	9.371	0.000	0.735
Material and content	Item 6	1.088	0.117	9.267	0.000	0.726
Students' motivation	Item 1	1.000	-	-	-	0.797
Students' motivation	Item 2	1.079	0.084	12.893	0.000	0.841
Students' motivation	Item 3	1.027	0.088	11.737	0.000	0.778
Students' motivation	Item 4	0.886	0.085	10.429	0.000	0.706
Students' motivation	Item 5	0.826	0.093	8.882	0.000	0.616
Students' belief	Item 1	1.000	-	-	-	0.707
Students' belief	Item 2	1.018	0.109	9.319	0.000	0.786
Students' belief	Item 3	1.011	0.107	9.431	0.000	0.821
Deep learning	Item 1	1.000	-	-	-	0.726
Deep learning	Item 2	0.878	0.093	9.393	0.000	0.708
Deep learning	Item 3	1.229	0.119	10.317	0.000	0.780
Deep learning	Item 4	1.143	0.115	9.910	0.000	0.748
Activities	Item 1	1.000	-	-	-	0.741
Activities	Item 2	1.070	0.089	12.053	0.000	0.833
Activities	Item 3	1.132	0.097	11.650	0.000	0.807
Activities	Item 4	1.054	0.090	11.775	0.000	0.815
Activities	Item 5	0.878	0.099	8.868	0.000	0.628
Activities	Item 6	0.846	0.097	8.726	0.000	0.618

Activities	Item 7	0.862	0.100	8.605	0.000	0.610
Activities	Item 8	0.897	0.098	9.112	0.000	0.644
Assessment	Item 1	1.000	-	-	-	0.719
Assessment	Item 2	1.110	0.114	9.705	0.000	0.801
Assessment	Item 3	1.003	0.114	8.833	0.000	0.706
Learning outcomes	Item 1	1.000	-	-	-	0.725
Learning outcomes	Item 2	1.103	0.094	12.467	0.000	0.722
Learning outcomes	Item 3	0.891	0.102	11.835	0.000	0.701
Learning outcomes	Item 4	1.132	0.114	12.912	0.000	0.756
Learning outcomes	Item 5	1.092	0.107	10.436	0.000	0.693
Learning outcomes	Item 6	0.985	0.121	11.406	0.000	0.731
Skills	Item 1	1.000	-	-	-	0.621
Skills	Item 2	1.381	0.170	8.139	0.000	0.688
Skills	Item 3	1.151	0.129	8.899	0.000	0.776
Skills	Item 4	1.490	0.158	9.427	0.000	0.844
Skills	Item 5	1.360	0.147	9.273	0.000	0.823
Attitude	Item 1	1.000	-	-	-	0.912
Attitude	Item 2	0.969	0.052	18.747	0.000	0.896
Attitude	Item 3	0.768	0.060	12.886	0.000	0.733
Attitude	Item 4	0.840	0.068	12.406	0.000	0.716

Table 34. AVE and CR index results of the model

Factor	Average Variance Extracted (AVE)	Composite Reliability (CR)
Environment	0.615	0.905
Teacher's emotion	0.630	0.835
Teacher's belief	0.641	0.899
Material and content	0.564	0.885
Students' motivation	0.565	0.865
Students' belief	0.597	0.816
Deep learning	0.549	0.830
Activities	0.515	0.893
Assessment	0.552	0.787
Learning outcomes	0.990	0.995
Skills	0.570	0.868
Attitude	0.671	0.890

Table 35. Indicators of discriminant validity: Maximum of shared squared variance (MSV) and average of shared squared variance (ASV)

Factor	AVE	MSV	ASV
Environment	0.615	0.463	0.514
Teacher's emotion	0.630	0.517	0.400
Teacher's belief	0.641	0.517	0.501
Material and content	0.564	0.538	0.542
Students' motivation	0.565	0.545	0.523

Students' belief	0.597	0.188	0.246
Deep learning	0.549	0.547	0.550
Activities	0.515	0.567	0.648
Assessment	0.552	0.518	0.522
Learning outcomes	0.990	0.397	0.391
Skills	0.570	0.560	0.541
Attitude	0.671	0.580	0.482

Table 36. Discriminant validity: Pearson correlation and AVE square root values

	ENV	TE	TB	MC	SM	SB	DL	ACT	ASS	LO	SKI	ATT
ENV	0.783											
TE	0.589	0.802										
TB	0.626	0.627	0.799									
MC	0.585	0.447	0.595	0.750								
SM	0.517	0.397	0.434	0.618	0.750							
SB	0.174	0.049	0.142	0.194	0.314	0.767						
DL	0.397	0.261	0.408	0.475	0.571	0.366	0.746					
ACT	0.626	0.504	0.615	0.634	0.661	0.307	0.639	0.714				
ASS	0.552	0.357	0.451	0.441	0.444	0.257	0.476	0.637	0.743			
LO	0.234	0.011	0.224	0.393	0.389	0.274	0.569	0.484	0.407	0.995		
SKI	0.437	0.299	0.436	0.468	0.478	0.196	0.551	0.658	0.499	0.630	0.752	
ATT	0.426	0.317	0.445	0.474	0.423	0.116	0.542	0.616	0.412	0.462	0.712	0.817

Note: Diagonal blue numbers are AVE square root values

ENV = Environment; TE = Teacher's emotion; TB = Teacher's belief; MC = Material and content; SM = Students' motivation; SB = Students' belief; DL = Deep learning; ACT = Activities; ASS = Assessment; LO = Learning outcomes; SKI = Skills; ATT = Attitude

Chapter 5 Reconstructing the intrinsic relationship between student-centered approach and competence development in Italian and Chinese context – quantitative research results

There are many potential factors for promoting students' competence development based on the influence of the student-centered approach. This chapter, mainly based on the quantitative data collected from students' semi-structured questionnaire, attempts to construct a structural equation model of the influence of the student-centered approach on students' competence development from the bottom perspective of students, aiming to prove the hypothesis of the positive impact of the student-centered approach on students' competence development, and demonstrates different scenarios in various cultures.

5.1 Data collection

The quantitative data were collected by questionnaire over a period of twelve months (two semesters), and permission was obtained from students and faculty members who teach in the courses. One semester is for the collection of Italian data through the web. The other semester is for collecting Chinese data through paper-based questionnaires. As displayed in Table 37, this cross-culture study mainly took two universities of eight courses in varying years of bachelor's degree and master's degree in Italy and China as the sample source. The sample courses all belong to the disciplinary area of Education. Among them, the four cases in Italy included two bachelor's degree courses and two master's degree courses, while the four cases in China were all bachelor's degree courses. There are two questionnaires for each student in total.

First, the professors distributed the survey QR codes to selected course students to complete the first questionnaire to test the intended learning outcomes based on the syllabus, at the beginning of the course. After reading the informed consent, the students who agreed to participate in the survey completed the online questionnaire. As the initial questionnaire was merely a self-assessment of the intended learning outcomes, all returned questionnaires were valid. The valid sample of the first questionnaire consisted of 363 participants (113 Italian and 250 Chinese students). Then, at the end of the course, students filled out the second questionnaire, which contained not only learning outcomes, but also the question items related to the environment, materials, activities, assessment, and others. Subsequently, we removed some collected data because (a) the participants' tended to answer regularly (e.g., selecting the same answer throughout the questionnaire, n = 11), or (b) they did not finish the whole questionnaire (n = 6). The final remaining valid sample of the second questionnaire included 341 participants (115 Italian students and 226 Chinese students).

It can be observed that the number of valid questionnaires recovered from Italian students for the second time is slightly more than that of the first, even though the second questionnaire contained a much more significant number of questions. Since the researcher sent the second questionnaire via email to invite each student to fill it in, perhaps they were motivated by the researcher's enthusiasm, resulting in the response rate of the second questionnaire being higher than the first. Moreover, the first questionnaire was used to obtain the average of the intended learning outcomes; thus, the number of recoveries will not affect the research results. The detailed collection of the quantitative data is presented as following Table 37.

Table 37. Quantitative data collection

Cases	Degree and	Total number	The first	The second	Recovery

	grade level	of students in the course	valid questionnaire	valid questionnaire	efficiency of the second (%)
Italy	(Education)				
A	Third year for bachelor's degree	17	17	17	100%
B	Second year for bachelor's degree	49	30	38	77.55%
C	Second year for master's degree	37	25	26	70.27%
D	Second year for master's degree	55	41	34	61.82%
Total		158	113	115	72.78%
China	(Education)				
E	Third year for bachelor's degree	60	59	56	93.33%
F	Second year for bachelor's degree	38	38	35	92.11%
G	Second year for bachelor's degree	53	52	50	94.33%
H	First year for bachelor's degree	105	101	85	80.95%
Total		256	250	226	88.28%

5.2 Data analysis and results

We analyzed the quantitative data of the study in two steps. First, descriptive statistics, demographic variables and correlation analysis were performed in SPSS 26.0 to estimate the levels of the study variables. The correlation coefficients of 0.10, 0.30, and 0.50 represent small, medium, and large effect sizes, respectively (Cohen, 1992). Second, we examined the relationship with structural equation modeling (SEM) in AMOS 23.0. To examine the hypothesis, we will test the association of the student-centered approach with students' competence development.

5.2.1 Descriptive statistics analysis in Italian and Chinese cases

Means and standard deviations are presented in Table 38. In the Italian context, participants indicated the course had a high level of environment for the student-centered approach (3.57 out of 4). Moreover, participants perceived the teachers' emotions (3.38 out of 4) and beliefs (3.50 out of 4) are appropriate for the student-centered course. Regarding the material and content, the results showed that participants' responses were positive, with a mean score of 3.38. As for the students themselves, they displayed relatively strong motivation (3.56 out of 4) and belief (3.34 out of 4) in adopting the student-centered approach in the course. In fact, they indicated that deep learning is more likely to arise within the student-centered approach (3.42 out of 4). In terms of activities and assessment, participants reported that in the student-centered course, there would be a broader range of activities to encourage engagement and interaction (3.35 out of 4), and teachers would provide more formative assessments (3.27 out of 4). As for student achievement, participants demonstrated that they could progress in learning outcomes (3.36 out of 4), general

skills (3.37 out of 4), and attitudes through the student-centered course (3.24 out of 4).

The data suggest that the overall picture in China is analogous to that of Italy. Expressly, Chinese participants indicated that they approved of the various elements of the student-centered approach and have progressed in the learning outcomes, general skills, and attitudes through the course. Nonetheless, we can notice that the mean of nearly all variables in China is slightly lower than that of Italy. Furthermore, in terms of student beliefs, participants expressed a moderate level of student-centered beliefs (2.87 out of 4), implying that they did not have a strong perception of being at the center of the course. Another result that obviously differs from Italy is that participants perceived that they had a medium level of self-assessment of the learning outcomes (2.86 out of 4). It is relatively lower compared to the average of Italian participants (3.26).

Table 38. Descriptive Statistics of student-centered approach and students' competence development of cases in Italy and China

	Possible range	Italian cases		Chinese cases	
		M	SD	M	SD
Student-centered approach					
Environment	1–4	3.57	0.44	3.49	0.38
Teacher's emotion	1–4	3.38	0.63	3.67	0.43
Teacher's belief	1–4	3.50	0.52	3.42	0.47
Material and content	1–4	3.38	0.49	3.33	0.51
Students' motivation	1–4	3.56	0.47	3.23	0.46
Students' belief	1–4	3.34	0.57	2.87	0.56
Deep learning	1–4	3.42	0.45	3.02	0.41
Activities	1–4	3.35	0.39	3.25	0.53
Assessment	1–4	3.27	0.43	3.18	0.38
Students' competence development					
Learning outcomes	1–4	3.26	0.46	2.86	0.41
General skills	1–4	3.37	0.60	3.03	0.44
Attitude	1–4	3.34	0.62	3.11	0.45

5.2.2 Demographic variables analysis in Italian and Chinese cases

This study collected a number of demographic variables of participants, including their biological sex (1 = male, 2 = female), age (1 = 15–24 years old, 2 = 25–34 years old, 3 = 35–44 years old, 4 = 45–54 years old, 5 = over 50 years old), and education (1 = bachelor's degree, 2 = master's degree). The detailed data of demographic variables are presented in Table 39. Apparently, there is a clear difference in age stratification between Italy and China. It is due to the disparity between the two nations' education systems. The researcher will explore these differences stemming from their respective educational systems in the discussion section.

According to the demographic variables, the researcher conducts a number of tests to examine whether there are significant differences between student-centered approach, gender, age, degree, and students' competence development. Specifically, the independent t-test was used to analyze whether there is a significant relationship between gender or degree with the student-centered approach and students' competence development. The one-way ANOVA analysis was used to prove whether the student-centered approach and competence development

differ significantly according to students' age.

As seen in Table 40, the student-centered approach and students' competence development scores of females are higher than that of males in Italy, while the flip side is in China. Nevertheless, t-test results to test whether the difference observed between males and females is significant or not showed that the difference is not statistically significant in both Italian and Chinese cases, as the P values in all cases are more than 0.05. Moreover, since all four cases in China have been pursuing bachelor's degrees and fall within the same age range, only gender disparities are conducted. With regard to the different study degrees in Italy, as shown in Table 41, the results showed that the P values are more than 0.05, indicating that there is no difference between bachelor's or master's degrees in student-centered approach and student-competence development.

In terms of the age variable, one-way ANOVA analysis of variance results demonstrated that there is no significant difference between age groups in the student-centered approach and students' competence development ($p > 0.05$), as displayed in Table 42. Therefore, different ages will not cause differences in adopting the student-centered approach and students' competence development.

Overall, the finding of this study suggested that regardless of Italy or China, there is no significant difference between gender, age, degree and student-centered approach, and competence development. It implies that the demographic variables do not impact the student-centered approach and students' competence development differently.

Table 39. Descriptive statistics of demographic variables

Variables	Italy		China	
	Number	Proportion	Number	Proportion
Gender				
Male	12	10.43%	45	19.91%
Female	103	89.57%	181	80.09%
Degree				
For bachelor degree	55	47.83%	226	100%
For master degree	60	52.17%	0	0%
Age				
15–24 years old	71	61.74%	226	100%
25–34 years old	28	24.35%	0	0%
35–44 years old	8	6.95%	0	0%
45–54 years old	2	1.74%	0	0%
over 50 years old	6	5.22%	0	0%
Total	115	100%	226	100%

Table 40. T-test results comparing males and females on student-centered approach and students' competence development in the Italian and Chinese cases

	Male	Female	T	P
Italy				
Student-centered approach	3.26±0.37	3.33±0.39	-0.603	0.548

Students' competence development	3.31±0.39	3.42±0.43	-0.841	0.402
China				
Student-centered approach	3.41±0.32	3.32±0.34	1.702	0.090
Students' competence development	2.94±0.27	2.94±0.39	-0.090	0.929

Note. $^{*}p < .05$; $^{**}p < .01$.

Table 41. T-test results comparing different degree learning on student-centered approach and students' competence development in the Italian cases

	Bachelor's degree	Master's degree	T	P
Student-centered approach	3.31±0.39	3.34±0.40	-0.510	0.609
Students' competence development	3.34±0.43	3.46±0.40	-1.626	0.110

Note. $^{*}p < .05$; $^{**}p < .01$.

Table 42. One-way ANOVA results for student-centered approach and students' competence development by age variables in the Italian cases

	15–24 years old	25–34 years old	35–44 years old	45–54 years old	Over 55 years old	F	P
Italy							
Student-centered approach	3.28±0.41	3.38±0.35	3.31±0.40	3.61±0.35	3.63±0.38	1.185	0.322
Students' competence development	3.36±0.43	3.44±0.41	3.41±0.37	3.78±0.07	3.76±0.28	1.404	0.237

Note. $^{*}p < .05$; $^{**}p < .01$.

5.2.3 Correlation analysis: Associations between the variables of interest

The correlation coefficients of the association between the variables of interest are summarized in Tables 43 (Italian cases) and 43 (Chinese cases). Specifically, in Italian cases, the results showed that each factor of the student-centered approach was positively related to student development in learning outcomes, general skills, and attitude, with the overall correlation coefficients of the student-centered approach and students' competence development of 0.718 ($p < 0.01$). The results of the Chinese cases are comparable to those of Italy, with the overall correlation coefficients of the student-centered approach and students' competence development of 0.568 ($p < 0.01$), demonstrating that such two key variables are associated with each other. In brief, the student-centered approach was associated with students' competence development. These findings provide preliminary support for the hypothesized relationships.

Based on the comparison of the overall findings of Italy and China, it could be noticed that the correlation coefficient of the relationship between the student-centered approach and competence development in Italy is higher than that in China. Moreover, both in Italy and China, the factors of the student-centered approach are more effective for developing general skills and attitudes than learning outcomes, from the correlation coefficients. In section 5.3, the researcher will present possible explanations for these phenomena and discuss them. Although the cases from Italy and China are proven to correlate well between the student-centered approach and students' competence development, it was supposed that the individual case might not be. The researcher will further analyze the specific ones from qualitative data.

Table 43. Correlation analysis results of sub-dimensions of the student-centered approach and students' competence development in four Italian cases

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Student-centered approach												
1. ENV	-											
2. TE	.688**	-										
3. TB	.731**	.768**	-									
4. MC	.767**	.592**	.135	-								
5. SM	.596**	.582**	.515**	.633**	-							
6. SB	.361**	.290**	.323**	.314**	.298**	-						
7. DL	.620**	.443**	.513**	.577**	.626**	.390**	-					
8. ACT	.720**	.663**	.659**	.740**	.730**	.321**	.664**	-				
9. ASS	.619**	.490**	.618**	.553**	.498**	.433**	.574**	.513**	-			
Students' competence development												
10. LO	.398**	.331**	.223*	.176*	.387**	.211*	.490**	.399**	.393**	-		
11. SKI	.592**	.552**	.547**	.542**	.529**	.284**	.209*	.606**	.514**	.574**	-	
12. ATT	.676**	.548**	.569**	.633**	.540**	.265**	.476**	.688**	.587**	.535**	.792**	

Note: $^*p < .05$; $^{**}p < .01$.

ENV = Environment; TE = Teacher's emotion; TB = Teacher's belief; MC = Material and content; SM = Students' motivation; SB = Students' belief; DL = Deep learning; ACT = Activities; ASS = Assessment; LO = Learning outcomes; SKI = General skills; ATT = Attitude

Table 44. Correlation analysis results of sub-dimensions of the student-centered approach and students' competence development in four Chinese cases

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Student-centered approach												
1. ENV	-											
2. TE	.663**	-										
3. TB	.631**	.533**	-									
4. MC	.571**	.461**	.583**	-								
5. SM	.584**	.436**	.518**	.519**	-							
6. SB	.210*	.179*	.199**	.186*	.237**	-						
7. DL	.464**	.246**	.503**	.446**	.600**	.395**	-					
8. ACT	.597**	.475**	.590**	.572**	.669**	.270**	.581**	-				
9. ASS	.511**	.341**	.561**	.489**	.416**	.235**	.514**	.479**	-			
Students' competence development												
10. LO	.344**	.180*	.395**	.156*	.202**	.209**	.184*	.154*	.321**	-		
11. SKI	.408**	.318**	.407**	.320**	.538**	.203**	.340**	.418**	.415**	.513**	-	
12. ATT	.460**	.340**	.486**	.436**	.538**	.239**	.459**	.405**	.493**	.526**	.765**	-

Note: $^{*}p < .05$; $^{**}p < .01$.

ENV = Environment; TE = Teacher's emotion; TB = Teacher's belief; MC = Material and content; SM = Students' motivation; SB = Students' belief; DL = Deep learning; ACT = Activities; ASS = Assessment; LO = Learning outcomes; SKI = General skills; ATT = Attitudes

5.2.4 Testing the direct effects of the student-centered approach on students' competence development: Constructing structural equation modeling

The correlation between two variables does not imply causation. In this section, the researcher further assessed the direct effect of the student-centered approach on students' competence development with the structural equation modelings constructed by AMOS 23.0 software. Overall, both the Italian and Chinese case model fit was acceptable. Model results consistent with the hypothesis indicated that adopting the student-centered approach has a positive impact on students' competence development after controlling for gender, age, and degree. In other words, teachers employing the student-centered approach in the course would lead to higher levels of students' competence development.

Model of Italian cases. Specifically, as for the Italian cases, the result suggested that the model fit was well, $\chi2 = 643.108$, $df = 602$, $\chi2/df = 1.068$, RMSEA = 0.018, TLI = 0.982, CFI = 0.985, SRMR = 0.045 (Figure 15). It implied that the model findings confirmed the initial hypothesis and revealed that, in Italian contexts, courses with a student-centered approach were related to greater levels of students' competence development.

Upon further examination of the path coefficients, the researcher determined that practically all pathways are significant except for very few ones. Concretely, as summarized in Table 45, the environment has a significant positive impact on learning outcomes ($B = 0.203$, SE = 0.071, Z = 2.866, $p = 0.004$, $\beta = 0.219$), on general skills ($B = 0.209$, SE = 0.073, Z = 2.878, $p = 0.004$, $\beta = 0.209$), and attitudes ($B = 0.22$, SE = 0.067, Z = 3.296, $p =< 0.001$, $\beta = 0.241$).

Teacher's emotion has a significant effect on learning outcomes ($B = 0.23$, SE = 0.066, Z = 3.473, $p =< 0.001$, $\beta = 0.276$), on general skills ($B = 0.185$, SE = 0.067, Z = 2.774, $p = 0.006$, $\beta = 0.205$), and attitudes ($B = 0.206$, SE = 0.061, Z = 3.352, $p =< 0.001$, $\beta = 0.251$).

Teacher's belief has a positive impact on learning outcomes ($B = 0.164$, SE = 0.075, Z = 2.19, $p = 0.029$, $\beta = 0.165$), on general skills ($B = 0.221$, SE = 0.078, Z = 2.827, $p = 0.005$, $\beta = 0.205$), and attitudes ($B = 0.186$, SE = 0.07, Z = 2.647, $p = 0.008$, $\beta = 0.19$).

Material and content have positively significant effect on learning outcomes ($B = 0.035$, SE = 0.058, Z = 0.598, $p = 0.005$, $\beta = 0.046$), on general skills ($B=0.176$, SE=0.072, Z=2.439, $p=0.015$, $\beta=0.213$) and attitudes ($B=0.163$, SE=0.066, Z=2.479, $p=0.013$, $\beta=0.217$).

Students' motivation has a significant positive impact on learning outcomes ($B = 0.181$, SE = 0.069, Z = 2.631, $p = 0.009$, $\beta = 0.208$), on general skills ($B = 0.167$, SE = 0.07, Z = 2.379, $p = 0.017$, $\beta = 0.177$), and attitudes ($B = 0.137$, SE = 0.063, Z = 2.177, $p = 0.029$, $\beta = 0.159$).

Students' belief has a substantial positive effect on their learning outcomes ($B = 0.252$, SE = 0.064, Z = 3.905, $p =< 0.001$, $\beta = 0.316$), on general skills ($B = 0.167$, SE = 0.064, Z = 2.623, $p = 0.009$, $\beta = 0.194$), and attitudes ($B = 0.179$, SE = 0.058, Z = 3.065, $p = 0.002$, $\beta = 0.228$).

Deep learning has a significant positive impact on learning outcomes ($B = 0.147$, SE = 0.066, Z = 2.231, $p=0.026$, $\beta=0.193$), on attitudes ($B = 0.135$, SE = 0.061, Z = 2.216, $p = 0.027$, $\beta = 0.18$). However, the pathway result showed that there is not a significant impact of deep learning on general skills ($B = 0.119$, SE = 0.065, Z = 1.838, $p = 0.066$, $\beta = 0.144$).

Activities have a significantly beneficial effect on learning outcomes ($B = 0.194$, SE = 0.075, Z = 2.576, $p = 0.01$, $\beta = 0.204$), on general skills ($B = 0.23$, SE = 0.078, Z = 2.931, $p = 0.003$, $\beta = 0.223$), and attitudes ($B = 0.16$, SE = 0.069, Z = 2.31, $p = 0.021$, $\beta = 0.17$).

Assessment has a significant positive impact on learning outcome ($B = 0.177$, SE = 0.08, Z =

2.197, $p = 0.028$, $\beta = 0.173$), on general skills ($B = 0.114$, SE = 0.082, $Z = 1.392$, $p = 0.164$, $\beta = 0.102$), and attitudes ($B = 0.254$, SE = 0.077, $Z = 3.288$, $p = 0.001$, $\beta = 0.252$).

Model of Chinese cases. The result of the Chinese cases indicated that the model fit was acceptable, $\chi2 = 679.620$, $df = 602$, $\chi2/df = 1.129$, RMSEA = 0.024, TLI = 0.968, CFI = 0.973, SRMR = 0.046. Therefore, the model findings in the Chinese environment can also prove the hypothesis, meaning that applying the student-centered approach can positively impact students' competence development.

Through further analyzed the pathway coefficients, it can be found that except for a small number of exceptions, nearly all pathways are significant. In detail, as presented in Table 46, the environment has a significant positive impact on learning outcomes ($B = 0.123$, SE = 0.074, $Z = 1.651$, $p = 0.099$, $\beta = 0.123$), on general skills ($B = 0.177$, SE = 0.065, $Z = 2.699$, $p = 0.007$, $\beta = 0.193$), and attitudes ($B = 0.233$, SE = 0.073, $Z = 3.204$, $p = 0.001$, $\beta = 0.233$).

Teacher's emotion has a significant positive effect on learning outcomes ($B = 0.181$, SE = 0.074, $Z = 2.464$, $p = 0.014$, $\beta = 0.185$), on general skills ($B = 0.211$, SE = 0.065, $Z = 3.267$, $p = 0.001$, $\beta = 0.235$), and attitudes ($B = 0.231$, SE = 0.071, $Z = 3.25$, $p = 0.001$, $\beta = 0.235$).

Teacher's belief has a positive impact on learning outcomes ($B = 0.212$, SE = 0.083, $Z = 2.547$, $p = 0.011$, $\beta = 0.191$), on general skills ($B = 0.24$, SE = 0.073, $Z = 3.265$, $p = 0.001$, $\beta = 0.235$), and attitudes ($B = 0.246$, SE = 0.08, $Z = 3.07$, $p = 0.002$, $\beta = 0.221$).

Material and content have substantial positive effect on learning outcomes ($B = 0.276$, SE = 0.099, $Z = 2.787$, $p = 0.005$, $\beta = 0.23$), on general skills ($B = 0.275$, SE = 0.087, $Z = 3.156$, $p = 0.002$, $\beta = 0.25$), and attitudes ($B = 0.275$, SE = 0.095, $Z = 2.909$, $p = 0.004$, $\beta = 0.229$).

Students' motivation has a significantly beneficial effect on learning outcomes ($B = 0.319$, SE = 0.089, $Z = 3.568$, $p < 0.001$, $\beta = 0.289$), on general skills ($B = 0.146$, SE = 0.074, $Z = 1.98$, $p = 0.048$, $\beta = 0.145$), and attitudes ($B = 0.266$, SE = 0.084, $Z = 3.175$, $p = 0.001$, $\beta = 0.241$).

Students' belief has a significant positive impact on learning outcomes ($B = 0.312$, SE = 0.105, $Z = 2.97$, $p = 0.003$, $\beta = 0.238$), on general skills ($B = 0.267$, SE = 0.091, $Z = 2.944$, $p = 0.003$, $\beta = 0.222$), and attitudes ($B = 0.284$, SE = 0.099, $Z = 2.856$, $p = 0.004$, $\beta = 0.216$).

Deep learning has a significant effect on on learning outcomes ($B = 0.23$, SE = 0.096, $Z = 2.399$, $p = 0.016$, $\beta = 0.19$), on general skills ($B = 0.294$, SE = 0.087, $Z = 3.389$, $p < 0.001$, $\beta = 0.263$), and attitudes ($B = 0.231$, SE = 0.091, $Z = 2.528$, $p = 0.011$, $\beta = 0.19$).

Activities have no significant effect on learning outcomes ($B = 0.163$, SE = 0.084, $Z = 1.93$, $p = 0.054$, $\beta = 0.158$), but a positive effect on general skills ($B = 0.148$, SE = 0.073, $Z = 2.017$, $p = 0.044$, $\beta = 0.156$), and attitudes ($B = 0.245$, SE = 0.087, $Z = 2.814$, $p = 0.005$, $\beta = 0.237$).

Assessment does not have a significant impact on learning outcomes ($B = 0.108$, SE = 0.08, $Z = 1.359$, $p = 0.174$, $\beta = 0.103$), but with a significant effect on general skills ($B = 0.191$, SE = 0.07, $Z = 2.713$, $p = 0.007$, $\beta = 0.197$), and attitudes ($B = 0.184$, SE = 0.077, $Z = 2.406$, $p = 0.016$, $\beta = 0.175$).

In general, the two model results yielded by data from both the Italian and Chinese cases demonstrated that the student-centered approach positively impacts students' competence development. However, it can also be observed in the subtleties of the pathway analysis that in the four Italian cases, there was one insignificant pathway, which was deep learning to general skills. Similarity, in the Chinese cases, there were two pathways that failed to explain their causal relationship, from activities to learning outcomes and from assessment to learning outcomes. In

this regard, we will attempt to explain and discuss them in the section that follows. In addition, the researcher will combine qualitative data from specific cases and further explore the causes of these phenomena in the next chapter.
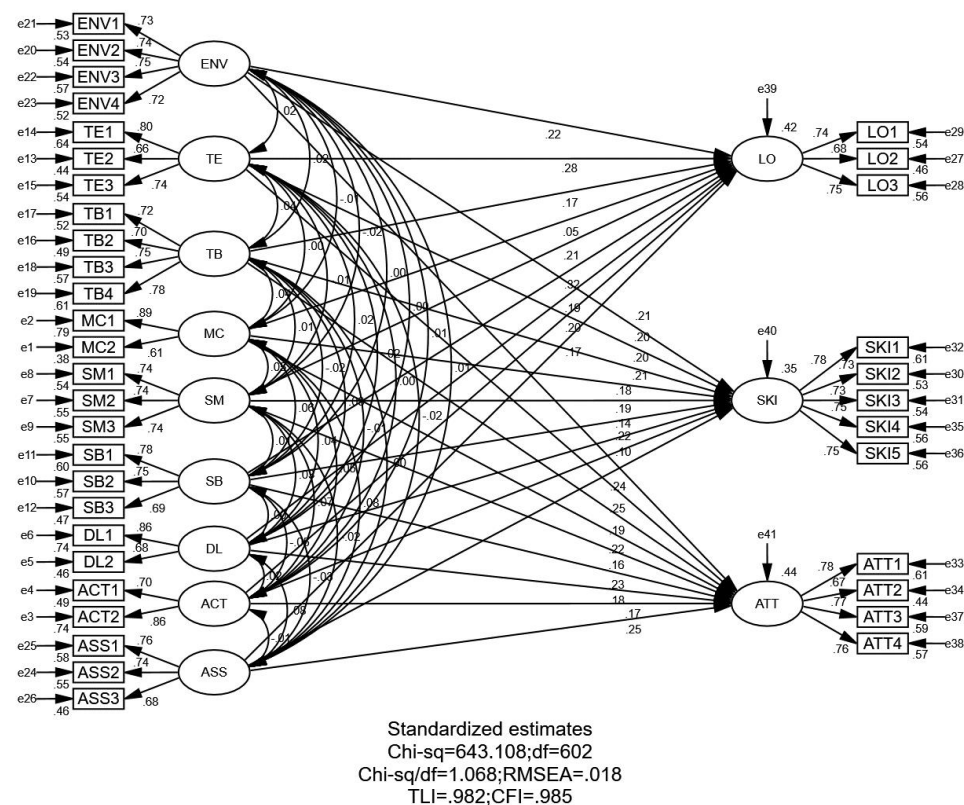
Figure 15. Structural equation modeling depicting the relationship between factors from the student-centered approach and students' competence development in the Italian cases

Note. ENV = Environment; TE = Teacher's emotion; TB = Teacher's belief; MC = Material and content; SM = Students' motivation; SB = Students' belief; DL = Deep learning; ACT = Activities; ASS = Assessment; LO = Learning outcomes; SKI = General skills; ATT = Attitudes

Table 45. Pathway analysis of relationship between factors from student-centered approach and students' competence development in the Italian cases

	Path		B	SE	Z	p	β
Environment	→	Learning outcomes	0.203	0.071	2.866	0.004	0.219
Environment	→	General skills	0.209	0.073	2.878	0.004	0.209
Environment	→	Attitudes	0.220	0.067	3.296	<0.001	0.241
Teacher's emotion	→	Learning outcomes	0.230	0.066	3.473	<0.001	0.276
Teacher's emotion	→	General skills	0.185	0.067	2.774	0.006	0.205
Teacher's emotion	→	Attitudes	0.206	0.061	3.352	<0.001	0.251
Teacher's belief	→	Learning outcomes	0.164	0.075	2.190	0.029	0.165
Teacher's belief	→	General skills	0.221	0.078	2.827	0.005	0.205
Teacher's belief	→	Attitudes	0.186	0.070	2.647	0.008	0.190
Material and content	→	Learning outcomes	0.035	0.058	0.598	0.005	0.046

|							
Material and content	→	General skills	0.176	0.072	2.439	0.015	0.213
Material and content	→	Attitudes	0.163	0.066	2.479	0.013	0.217
Students' motivation	→	Learning outcomes	0.181	0.069	2.631	0.009	0.208
Students' motivation	→	General skills	0.167	0.070	2.379	0.017	0.177
Students' motivation	→	Attitudes	0.137	0.063	2.177	0.029	0.159
Students' belief	→	Learning outcomes	0.252	0.064	3.905	<0.001	0.316
Students' belief	→	General skills	0.167	0.064	2.623	0.009	0.194
Students' belief	→	Attitudes	0.179	0.058	3.065	0.002	0.228
Deep learning	→	Learning outcomes	0.147	0.066	2.231	0.026	0.193
Deep learning	→	General skills	0.119	0.065	1.838	0.066	0.144
Deep learning	→	Attitudes	0.135	0.061	2.216	0.027	0.180
Activities	→	Learning outcomes	0.194	0.075	2.576	0.010	0.204
Activities	→	General skills	0.230	0.078	2.931	0.003	0.223
Activities	→	Attitudes	0.160	0.069	2.310	0.021	0.170
Assessment	→	Learning outcomes	0.177	0.080	2.197	0.028	0.173
Assessment	→	General skills	0.114	0.082	1.392	0.164	0.102
Assessment	→	Attitudes	0.254	0.077	3.288	0.001	0.252
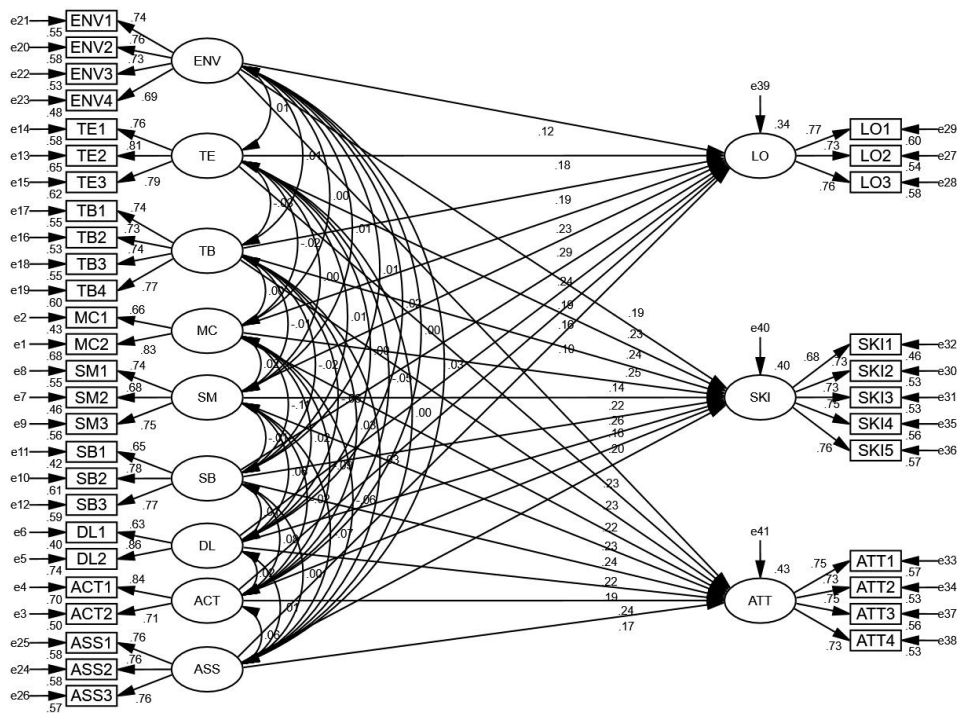
Figure 16. Structural equation modeling depicting the relationship between factors from the student-centered approach and students' competence development in the Chinese cases

Note. ENV = Environment; TE = Teacher's emotion; TB = Teacher's belief; MC = Material and content; SM = Students' motivation; SB = Students' belief; DL = Deep learning; ACT = Activities; ASS = Assessment; LO = Learning outcomes; SKI = General skills; ATT = Attitudes

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Table 46. Pathway analysis of relationship between factors from student-centered approach and students' competence development in the Chinese cases

Path			B	SE	Z	p	β
Environment	→	Learning outcomes	0.123	0.074	1.651	0.099	0.123
Environment	→	General skills	0.177	0.065	2.699	0.007	0.193
Environment	→	Attitudes	0.233	0.073	3.204	0.001	0.233
Teacher's emotion	→	Learning outcomes	0.181	0.074	2.464	0.014	0.185
Teacher's emotion	→	General skills	0.211	0.065	3.267	0.001	0.235
Teacher's emotion	→	Attitudes	0.231	0.071	3.250	0.001	0.235
Teacher's belief	→	Learning outcomes	0.212	0.083	2.547	0.011	0.191
Teacher's belief	→	General skills	0.240	0.073	3.265	0.001	0.235
Teacher's belief	→	Attitudes	0.246	0.080	3.070	0.002	0.221
Material and content	→	Learning outcomes	0.276	0.099	2.787	0.005	0.230
Material and content	→	General skills	0.275	0.087	3.156	0.002	0.250
Material and content	→	Attitudes	0.275	0.095	2.909	0.004	0.229
Students' motivation	→	Learning outcomes	0.319	0.089	3.568	<0.001	0.289
Students' motivation	→	General skills	0.146	0.074	1.980	0.048	0.145
Students' motivation	→	Attitudes	0.266	0.084	3.175	0.001	0.241
Students' belief	→	Learning outcomes	0.312	0.105	2.970	0.003	0.238
Students' belief	→	General skills	0.267	0.091	2.944	0.003	0.222
Students' belief	→	Attitudes	0.284	0.099	2.856	0.004	0.216
Deep learning	→	Learning outcomes	0.230	0.096	2.399	0.016	0.190
Deep learning	→	General skills	0.294	0.087	3.389	<0.001	0.263
Deep learning	→	Attitudes	0.231	0.091	2.528	0.011	0.190
Activities	→	Learning outcomes	0.163	0.084	1.930	0.054	0.158
Activities	→	General skills	0.148	0.073	2.017	0.044	0.156
Activities	→	Attitudes	0.245	0.087	2.814	0.005	0.237
Assessment	→	Learning outcomes	0.108	0.080	1.359	0.174	0.103
Assessment	→	General skills	0.191	0.070	2.713	0.007	0.197
Assessment	→	Attitudes	0.184	0.077	2.406	0.016	0.175

5.3 "In between" conclusion and discussion

The central objective of this chapter is to provide preliminary evidence to understand the relationship between the student-centered approach and students' competence development. With the empirical study, the findings showed that upon controlling for gender, age and degree, the student-centered approach is positively related to students' competence development, which backed up the hypothesis, and is consistent with the previous research results (e.g., Ali, 2019; Serin, 2018; Soubra et al., 2022).

From course design to implementation, the student-centered approach covered a number of aspects, implying that its success is the consequence of a combination of factors (Jaiswal & Al-Hattami, 2020; Lancaster & Topper, 2023). When teachers embrace the student-centered approach, which students can perceive in the course, it has a favorable effect on the development

of students' competence. In this regard, students are given autonomy over their learning, and they are more likely to develop both professional knowledge and 21st-century or soft skills, such as critical thinking, problem-solving, teamwork, communication, creativity, grit, perseverance, and time management, and attitudes like responsibility. These are among the most desired competence across employers. (Distler, 2007; Kaput, 2018; Motjolopane, 2021). Thus, our findings reaffirm that adopting the student-centered approach in the course effectively influences students' competence development.

However, based on an overall analysis of data from the Italian and Chinese cases, including descriptive statistics, demographic variables, correlation analysis, and causal analysis, the researcher observed that despite the similarities in the results between the two national cases, there are several differences. Below, we shall discuss each of them individually.

First, in descriptive statistics, although the general situation in China is comparable to that of Italy, the mean of nearly all variables in China is marginally lower than that of Italy, especially with regard to students' beliefs and self-assessment of learning outcomes. In addition to that, the correlation coefficient between the student-centered approach and competence development in Italy is higher than in China. These phenomena mean that the cases in Italy seem to be more successful in embracing the student-centered approach. It is assumed that numerous reasons have led to these results. Regarding the policies, while Italy and China have launched a series of policies promoting the student-centered approach, Europe is one step ahead in promoting the student-centered approach and developing the competence framework, as we have analyzed in Chapter 2.

Moreover, cultural differences affect teaching and learning. Due to diverse cultural backgrounds, Chinese students need to overcome more transitional barriers when adapting to a student-centered approach (Jiang & Kosar Altinyelken, 2020). As elaborated in Rienties and Tempelaar's (2013) research, the student-centered approach may be more suitable for European and Anglo-Saxon nations with low power distance and weak uncertainty avoidance. Conversely, students from cultures with a high power distance and strong uncertainty avoidance are more accustomed to teacher-centered and exam-oriented approaches, such as those in Confucian Asian nations like China and Vietnam. In this sense, students from China face greater transitional obstacles than students from Italy, when accepting a student-centered approach. For instance, students encountered considerable adaptation challenges regarding their conceptions and behavior, from believing in instructors' authority to becoming critical and empowered to question and criticize teachers. It implies that teachers shall provide students with more guidance and assistance in the Chinese student-centered course.

Thus, from the perspective of descriptive data, although the shift to a student-centered approach has begun to emerge, it is a gradual transformation. In comparison, the process in China is slower. The implementation of the student-centered approach and changes in inertia of students' beliefs continue to need time and effort. The gap between the learning outcomes in the two nation's cases, and the reasons for it will be examined in depth in the next chapter.

Second, from the results of the demographic variables, we can notice that there are students of all ages enrolled in Italian undergraduate and master's programs, whereas the students of Chinese undergraduate courses are focused only on the age period under 24, mainly from 19 to 22. It implies that the higher education system in Italy is more open. In fact, despite Italy and China

being both centralized nations with top-down education systems, their systems are notably dissimilar (Mao et al., 2019). Figures 17 and 18 display the Italian higher education system and Chinese education system, respectively.

The Italian higher education system possesses the apparent characteristic of openness and equity, which refers to the capacity of the system to cater to the demands of a different group of students (e.g., disabled students, mature students) as well as students from varying socioeconomic contexts (Durazzi, 2014). This is mainly attributed to the Italian university admission system, whose main strength lies in maintaining the system open overall. Access is facilitated for non-traditional students, especially mature students, by the recognition of professional experience that is, in some cases, converted into university credits. There is also a minimum requirement before the students apply for the university – a secondary school leaving certificate. Nevertheless, failing or receiving a low grade on these exams does not prevent students from enrolling in any free access degree at a higher education institution. Arguably, the Italian higher education system has a more egalitarian and accessible upward mobility. Therefore, in light of these characteristics, it is easy to see how a 55-year-old mature student may sit next to a 20-year-old student in the same Italian classroom.
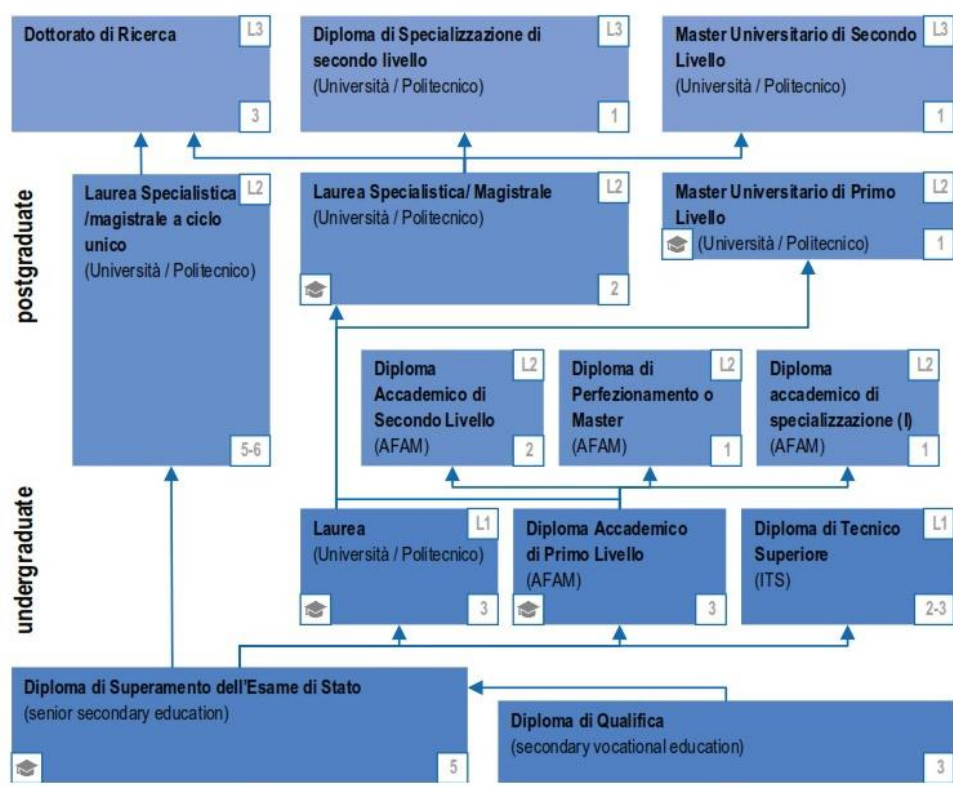
Figure 17. Italian higher education system (I-Studentz Group, 2022)

As depicted in Figure 18, the primary route to university in China is through the university entrance exam – a nationally standardized examination, along the path of general education (Loyalka et al., 2017). This exam determines whether or not a student can enroll in university and at what level. Furthermore, it is challenging and tough for students with vocational education to get into a full-time university, not only because they need to pass an additional standardized test,

but also because there are a limited number of places available. This means that rare opportunities for such mobility. Regarding adult education, China's education system provides a pathway for students to pursue higher degrees. However, the "gold" of the resulting diplomas is not comparable to that of the diplomas by general education (Chen, 2004; Jiang & Ke, 2021). This indicates that full-time university diplomas are more recognized and favorable by the labor market.
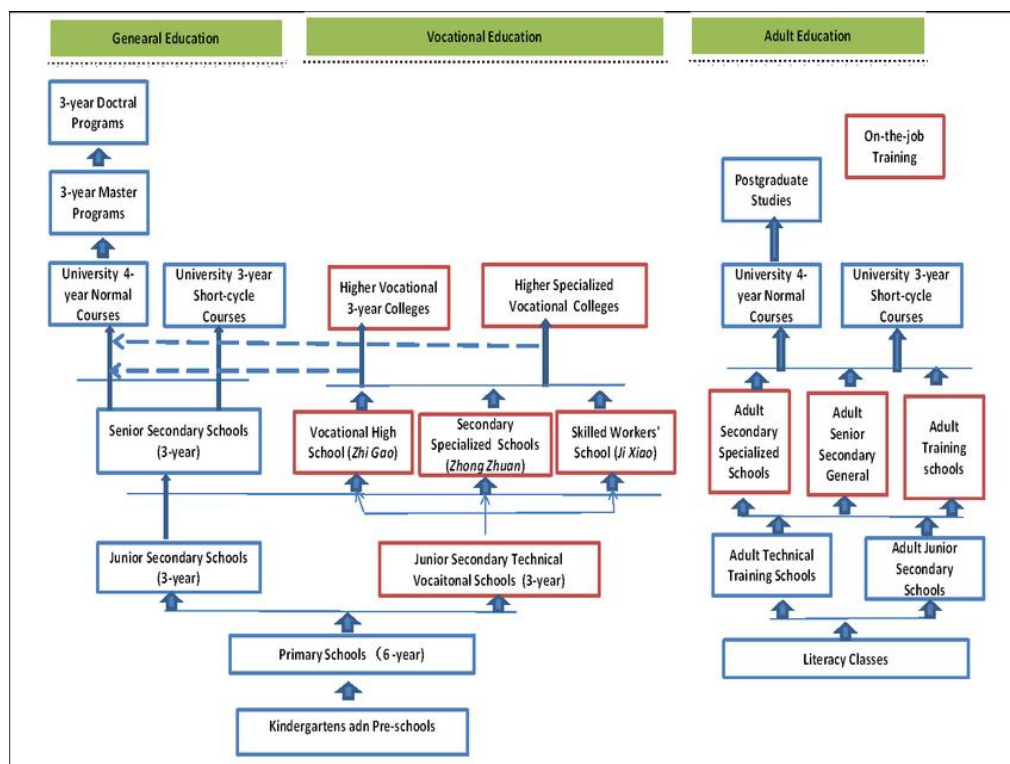

Figure 18. Chinese education system (Po, 2014)

Overall, many factors, including population size and competitive traditions, and others influence the formation of the Chinese higher education system. In such a context, there are fewer scenarios where young and mature students study together in the same classroom in a full-time university, particularly in the undergraduate period. Compared to the Italian higher education system, the openness and equity of the Chinese system need to be improved. Nonetheless, the Chinese higher education system has its advantages. For example, the dropout rate in China's higher education is significantly lower than in Italy's, but this is beyond the subject of our present conversation.

Third, consistent with prior, this study reaffirmed that the student-centered approach was positively associated with students' competence development. Many existing studies advocate that the student-centered approach is beneficial for learning outcomes (Al Faruki et al., 2019; Murphy et al., 2021), academic achievement (Jaiswal & Al-Hattami, 2020), general skills (Ali, 2019), and attitude (Armbruster et al., 2009; Klemenčič, 2020). However, based on our findings from correlation analysis, it is interesting to note that both in Italy and China, the various factors of the student-centered approach are more associated with developing general skills and attitudes than learning outcomes. Yet this perspective is rarely mentioned. As Brown (2008) posited, the goal of

using innovative approaches is to produce "self-sufficient, independent, creative thinkers."

Moreover, developing students' transferable skills and attitudes has been consistently emphasized to ensure European global competitiveness (ESG, 2015). The student-centered approach has been viewed as superior in stimulating the development of students' competence, particularly in preparing youngsters for the world of work (Altinyelken, 2011). In the next chapter, this study will conduct interviews with teachers to discuss this finding further.

Fourth, the model results in Italian cases indicated that the student-centered approach positively affected students' competence development. However, the pathway analysis revealed that deep learning had no substantial effect on developing general skills. There are two main reasons for this result. On the one hand, reviewing the questionnaire, the questions in the sub-dimension of deep learning refer to students' proficiency in using course expertise (learning outcomes) and autonomy towards learning. The student-centered approach is regarded as the effective path to facilitating deep learning (Hoidn & Reusser, 2020; Wulf, 2019). In this regard, students' responses were to reflect and measure whether they were in deep learning. Wilson et al. (2016) also suggested that deep learning is not the panacea, especially in estimating student proficiency. Thus, it is understandable that the path is insignificant, given that the questions of the questionnaire do not cover the general skills, which is a constraint of the questionnaire's design, and that subsequent refining should include all aspects of competence.

On the other hand, emergency remote teaching has the potential to influence the students' deep learning. Higher education in Italy swiftly turned to emergency remote teaching and blended learning during the pandemic. This is a challenge and a unique opportunity for Italy's tertiary educators and students. COVID-19 has created opportunities for educators to engage with and embrace online resources as part of their teaching repertoire, redesign the course content into video lessons, and shift to an interactive online student-centered approach. In contrast, previously, this was not possible (Girelli et al., 2020). Some academics hold that this shift remains effective in deep learning and developing skills like critical thinking (e.g., Soubra et al., 2022). However, some studies revealed that the online student-centered approach did not afford the same control, communication, or experience they had in a face-to-face classroom, significantly impacting practical skills development, especially in the early stages of the pandemic (e.g., Ramos-Morcillo et al., 2020).

Last, in terms of the Chinese cases, the overall model result is the same as the one in Italy. Nevertheless, the findings of pathway analysis demonstrated that the activities and assessment failed to explain their significant effect on students' learning outcomes. Numerous studies have proved that activities and assessments effectively promote students' learning and develop their learning outcomes (e.g., Hoidn & Reusser, 2020; Lee & Hannafin, 2016), which contradicts the findings of this study. Based on the specific context, reasons and answers will be sought from the qualitative data, including the facets of course design, delivery and assessment.

Chapter 6 Deconstructing the student-centered approach role in students' competence development from the stakeholders' perspectives in Italian and Chinese context – qualitative research results

Quantitative research is used to examine the relationship between two variables in a broad sense, whereas qualitative research serves to deconstruct the interaction and influence between two variables in depth through the investigation of specific cases. In this chapter, the researcher articulated the effort to deconstructing the role of the student-centered approach in promoting students' competence development from university teachers' and students' accounts from several aspects, including the perspective of understanding the student-centered approach, course design, delivery, assessment, institutional support, and others. Based on the qualitative data mainly from students' semi-structured questionnaires and teachers' interviews, from a bottom perspective, this chapter aims to develop a holistic understanding and provide some implications on "how to foster students' competence during the course."

6.1 Data collection, transcription and analysis

Data collection. For the qualitative data, the first source was from the questionnaire. The researcher designed many open questions in the questionnaire. Although it was not mandatory for students to answer, students were encouraged to finish them. The second source was from interviews with teachers, based on the prepared interview outline. The interview is a collaborative effort and purposeful interaction between the interviewee and interviewers, in which a researcher can learn another person's knowledge in terms of a topic, to discover and record what that person has experienced, what she or he thinks and feels about it, and what significance or meaning it might have (Mears, 2012).

Before the interview, the academic interview confidentiality pledge was signed in order to dispel the concerns of the interviewees and build a trusting relationship. This study adopted two approaches for the interview, one was the face-to-face interview, and the other was the video interview. Originally, the interview time for each participant was scheduled to be 30 minutes. During the interview process, the researcher discussed the core issues with the interviewees, observing their interests attentively and asking in-depth questions based on the current situation.

The student participants' demographic information has been listed in Chapter 5. In terms of the interview sample, as presented in Table 47, there were eight teachers in eight cases. To be specific, five were male, three were female, seven held Ph.D. degrees, and one had a bachelor's degree. Regarding the sample's university position, there was one professor, four associate professors, two full-time lecturers, and one university researcher. The years of their teaching experience covered various duration, ranging from 0 to 5 years to 20 to 30 years.

From the demographic information of the interview sample, it can be seen that the gender ratio of the sample is relatively balanced. The sample's work positions basically encompassed all main types of teaching staff, and most interviewees hold doctoral degrees. Based on their years of teaching experience, it was clear that the sample contained both novice and experienced teachers. Therefore, the sample is reliable and representative to a considerable degree.

Transcription of qualitative data and analysis. All interviews and open-ended questions in the questionnaire were transcribed verbatim to analyze the data. The written materials were formed. Transcribing open questions and interview data is unquestionably more time-consuming

than performing interviews. Finally, the data of open questions from students were organized with 30,221 words. The qualitative interviews were then transcribed, resulting in about 48,420 words of single-spaced transcribed interview text, with Italy containing 28 pages and 15,492 words in English and China containing 24 pages and 32,628 words in Chinese, respectively. Subsequently, a detailed reading of the transcripts was undertaken to familiarize ourselves with the content of the qualitative data (Flick, 2009). The transcribed texts were extracted and analyzed using the qualitative data analysis software Nvivo 11.

Table 47. Teacher participants' demographic information

Participant	Gender	Course degree	Position	Teacher's degree	Teaching experience (years)	Interview duration (minutes)	Interview transcript (words)
IT-A	M	B	AS	Doctoral	20–30	63	5678
IT-B	M	B	UR	Bachelor	20–30	43	2706
IT-C	F	M	AS	Doctoral	10–20	35	3537
IT-D	F	M	AS	Doctoral	10–20	38	3558
CH-E	M	B	FL	Doctoral	5–10	62	8886
CH-F	M	B	P	Doctoral	10–20	36	5539
CH-G	M	B	AS	Doctoral	5–10	67	13488
CH-H	F	B	FL	Doctoral	0–5	37	4678

Note. F = Female, M = Male; B = Bachelor's degree, M = Master's degree; AS = Associate Professor, UR = University researcher, FL = Full-time lecturer, P = Professor.

To achieve our goal, this study adopted thematic analysis to identify and deconstruct the research data set in detail. As a qualitative analysis tool, thematic analysis is extensively used for various research questions. It is also regarded as a suitable qualitative method for analyzing large qualitative data sets (Nowell et al., 2017). Furthermore, given the theoretical flexibility of theme analysis, it can provide a highly adaptable approach that can be tailored to the specific requirements of various research. Thus, the qualitative data were analyzed and divided into varied themes, to depict convergences and divergences between the two national cases.

After deciding to use thematic analysis in the current research to examine qualitative data, the next is to determine how to conduct reliable thematic analysis. According to Braun and Clarke (2006), a rigorous thematic analysis can generate trustworthy and meaningful results. Owing to the lack of an explicit consensus regarding how researchers rigorously apply the thematic analysis (Nowell et al., 2017), this study conducted the thematic analysis with six steps, as summarized and adapted by Jia (2019, p. 109) and shown in Table 48 for details. As Miles et al. (2018) suggested, these data were subjected to several cycles of thematic coding analysis and review to strengthen the rigor and reliability of the qualitative research. Nevertheless, it is worth keeping in mind that there is no fixed stage for performing a thematic analysis, even if the researcher referred to a strict procedure. In other words, researchers can adjust it to fulfill specific study requirements wherever possible. This is the essence of the thematic analysis.

Finally, as stated by Braun and Clarke (2006), it is important that the final analysis will provide a clear, coherent, logical, and non-repetitive explanation of your research story, across the

entire theme, supported by sufficient data excerpts. Therefore, rather than merely offering a superficial description of the qualitative data, this study will construct the findings based on the data extracts and conclude some arguments that connect to the research topics.

Table 48. Step-by-step of thematic analysis (Jia, 2019)

Steps	Description of the step
1. Familiarizing with the interview data	Transcribing data
	Storing data in well-organized files
	Using ATLAS.ti or Nvivo software to organize the data
	Reading and re-reading the data
	Writing down initial ideas of codes and themes
	Keeping field notes
	Member checking
2. Generating initial codes	Coding the data according to the question across the entire data set
	Coding as detailed as possible
	Collecting data relevant to each code
	Peer debriefing
3. Identifying themes	Collating codes into potential themes
	Gathering all data relevant to each potential theme
	Keeping detailed notes about development and hierarchies of concepts and themes
	Peer debriefing
4. Reviewing themes	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2)
	Generating a thematic "map" of the analysis
	Peer debriefing
5. Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells
	Generating clear definitions and names for each theme
	Peer debriefing
6. Producing the report	Selecting vivid, compelling extract examples, final analysis of selected extracts
	Relating back of the analysis to the research question and literature
	Describing process of coding and analysis in sufficient details
	Producing a scholarly report of the analysis
	Peer debriefing

Note. This procedure is adapted based on the work of Braun and Clarke (2006), and Nowell et al. (2017).

6.2 Deconstructing the definition of student-centered approach

6.2.1 From students' perspectives: How student-centered reflected in the course?

Students' and teachers' perceptions of student-centered approach in course practice can contribute to reframing the understanding of this concept. In this regard, this empirical study first deconstructed the connotation of the student-centered approach by examining students' views of this terminology in practice. As Table 49 displayed, most sample students perceived that the courses were student-centered, with 93.91% in Italian cases and 91.59% in Chinese cases, respectively. Therefore, it is reliable to uncover "what is the true student-centered approach" from students' eyes.

Table 49. Inquiry into the course is student-centered

Cases	Agree		Disagree	
	Number	**Proportion**	**Number**	**Proportion**
Italy				
Case A	16	94.12%	1	5.88%
Case B	35	92.10%	3	7.9%
Case C	26	100%	0	0%
Case D	31	91.18%	3	8.82%
Total	108	93.91%	7	6.09%
China				
Case E	46	82.14%	10	17.86%
Case F	34	97.14%	1	2.86
Case G	46	92%	4	8%
Case H	81	95.29%	4	4.71%
Total	207	91.59%	19	8.41%

In the Italian cases, seven main themes were identified regarding the connotation of the student-centered approach in practice: the teacher's beliefs, activities, students' autonomy, environment, content, assessment, and stimulating student development. Moreover, there were some sub-themes within each main theme. Regarding each sub-themes, we extracted and listed one or two examples if they were covered in cases. For a more detailed description, Table 50 can be seen. The table's main theme is arranged in descending order by the number of examples mentioned by students.

The first main theme refers to the teacher's belief which determines the pursuit of student-centered, containing five sub-themes: respect for the needs of students, teacher's commitment, role, the starting point of course design, and authority. In Italian students' perspective, it is the most important element summarized from their daily course practice. Specifically, teachers' beliefs influence their classroom decisions and actions, which leads to ramifications for student development (Devlin, 2006, p. 112). In this regard, the student-centered courses are designed by instructors, when the teacher holds student-centered (e.g., learning-oriented, outcome-based, and participate-oriented) conceptions of teaching, that is, who are more likely to be concerned with what the student does and whether student activities contribute to appropriate learning and outcomes (Biggs, 2011). Consequently, with the student-centered belief, the teacher is more inclined to listen to students' needs and interests, split

the authority to students, and be a facilitator and guide to stimulate student learning and development. Even the students from cases A and C reflected that their teacher made the commitment, resulting in students' having more confidence and gratification for learning. In a word, from the examples of Italian students' words, we could conclude that the teacher' belief is the starting point and the most significant for realizing the student-centered approach.

The second main theme refers to activities that signify the differences from traditional instruction, including two sub-themes of engagement and interaction. As Hoidn and Reusser (2020) stated, effective teachers dedicate more time to content-related activities rather than lecturing, hence increasing students' cognitive engagement and active participation. The findings are in line with this perspective. Numerous students indicated that the course is very student-centered because the activities contribute more opportunities for them to engage in the course. This indicates that meaningful participation and interaction in activities is one of the essential components of the student-centered approach, through which students extend their knowledge and enhance their cognitive skills.

The third main theme refers to students' autonomy, consisting of two sub-themes: gaining more authority and leaving room for learning. Based on the literature, students' autonomy is explained in two ways. One is as a learning objective (Brockband & McGill, 2006). The other is as a manner to improve student learning achievements and self-regulated learning (Zimmerman, 1989). The finding is consistent with these two meanings in terms of the student's answers. Students believed they were at the center of the course when they perceived having autonomy in learning. In this regard, the students' autonomy is viewed as a way to improve their learning. Moreover, students reflected that the teacher created opportunities to develop students' autonomy by leaving room for students. In this sense, the students' autonomy belongs to the learning objective. Overall, regardless of its interpretation, student autonomy is one of the most important factors for the student-centered approach from the student's point of view.

The fourth main theme refers to the environment, and three sub-themes were grouped: interaction environment, "safe" environment, and course culture (negotiation and collaboration). Most sample students emphasized that the environment was significant in the student-centered approach, in which students' experiences were put at the center and aimed to provide them with opportunities to develop deep understandings. However, in the context of Italian cases, students from various cases reflected varying types of environments they observed. Concretely, the environment in case A focused on constructing a negotiated culture and interacting climate. Case B and C teachers provided a "safe" environment for students to express and learn freely. This environment was likely to be appropriate for inquiry-based learning and flipped classrooms, which teachers adopted. Finally, the teacher in case D created a collaborative culture since the teacher mainly adopted the group work strategy during the course. In general, it is necessary to construct an environment consistent with the adopted approach.

The subsequent fifth and sixth main themes refer to course content and assessment. Despite the fact that previous research has demonstrated that they are elements of the student-centered approach, few Italian students highlight them when discussing student-centeredness. As for the course content, only case B students mentioned it. They perceived the course content as practical-oriented and work-oriented, implying that the course design is around the students' (future) needs. Moreover, two sub-themes were categorized in terms of assessment: formative

assessment and summarized assessment. Students claimed that the formative assessment made them feel student-centered, since formative assessment can provide tailored feedback (instructor, peers, self) to help students advance their present understandings. Regarding the summative assessment, before determining students' final marks, clear assessment criteria should convey to students when they have achieved course objectives and give them a better experience of control over their learning processes (e.g., Hattie, 2012).

The last main theme viewed the student-centered approach as a way to stimulate student development, including knowledge and skills, or the term competence. In this sense, student-centered refers to center on student development, which is consistent with Zhao (2016)'s viewpoint. From the Italian sample students' perspectives, most elements covered in the student-centered approach aimed to contribute to students' competence development through more engagement and interaction, including constructing the knowledge, developing the skills and attitude, and "reshaping their own" in a more profound way.

Table 50. Code-book of students' perception of the student-centered approach in Italian cases

Main themes	Sub-themes	Example extract from cases
Teacher's belief	Respect for the needs of students	The teacher has always valued the ideas and needs of the students, and tried to stimulate improvement (Case A); Our needs and requirements have been listened to (Case C); I would say there was a lot of listening to us from the teacher (Case D).
	Commitment	He is personally committed to students (Case A); I believe that each of us has been given the opportunity to manifest our potential based on the teacher's commitment (Case C); In my opinion, receiving recognition of the teacher's commitment was very gratifying (Case C).
	Role	The teacher was able to take on the role of facilitator and conductor (Case A); The teacher is a real role of facilitator, integrating and guiding learning when necessary (Case C).
	Starting point of course design	The course is suitable for the students for whom it is designed (Case B); The courses are formulated for students (Case D).
	Authority	The teacher was able to split and manage "power" in the best possible way (Case A).
Activities	Engagement	The course is very student-centered because it is he who builds his training through active participation in the proposed activities (Case A); We could choose our favorite topic of presentation and be more involved in the course (Case C); We were encouraged to engage in the experiment and learn (Case D).
	Interaction	It was interesting to have more interaction with students, for example, by using other mass technological tools, such as Instagram and Tik

		Tok (Case B); The course was interactive, encouraging learning through the flipped classroom and meetings with experts (Case C); The teacher encouraged mutual learning and interaction between students.
Students' autonomy	Gain more authority	The lessons were conducted by us and for us (Case A); It is student-centered because it is up to students to find the solutions to the various exercises (Case B); It gives a lot of learning autonomy (Case C); We were free to choose the presentation topic and free to learn (Case D).
	Leave rooms for learning	The professor left us the space to research new technological innovations (Case A); It leaves room for peer learning (Case B).
Environment	Interacting environment "Safe" environment	The teacher created an environment of mutual influence based on the direct participation of all students (Case A). It constructed a "safe" environment that allows for lots of interaction. In the other courses, the lessons are frontal without any kind of interaction, perhaps also for fear of saying something wrong (Case B); There were an environment where we can be free to learn (Case C).
	Culture	**Negotiated culture**: The teacher always negotiated with students, including learning outcomes (Case A); **Collaborative culture**: The teacher creates a culture stimulating the comparison and mutual collaboration between students (Case D).
Assessment	Formative assessment	**Peer review and self-assessment**: It reflects through the comparison with the work of colleagues, and the opinions of his own (Case A); **Feedback**: I think it focuses on the student, reflecting immediately in a practical and concrete way the skills he can put into play (Case B); The student has the opportunity to receive feedback from the teacher (Case C).
	Summative assessment	The student has the possibility to create his own result based on the scores obtained in the various tests. In addition, the teacher gave the possibility to integrate the grade (Case D).
Content	Practical-oriented	It is based so much on practical exercises and little on theory (Case B).
	Work-oriented	The course content was customized according to work preferences (Case B); The content was about the student and for him or her being a future educator (Case B).
Stimulate students development	Knowledge and skills development	The professor allowed us to practice and also improve our digital research skills (Case A); It helps the student to learn about new tools thanks to the teacher's feedback (Case C).

Competence development	The instructor has regarded the students' thoughts and endeavored to promote their competence development (Case A);
	I think this course is strongly centered on the student as it stimulates his active participation and his competence through the autonomous preparation of the lesson materials, which, being exposed by the students themselves, are reworked and "made their own" in a more profound way (Case C);
	It is a very theoretical course, but it can be applied to the various needs of the learner and contribute to improving the learner's competence (Case D).

In the Chinese cases, nine main themes were identified with respect to the students' perception of the student-centered approach in practice: activities, teacher's beliefs, students' autonomy, environment, content, assessment, stimulating student development, teacher's emotion, and teacher's competence. In terms of each main theme, several sub-themes were categorized, with extracted examples from the cases, to fully present the theme. Table 51 provides a more detailed description. The table's main themes are listed in ascending order by the number of student-provided examples.

The first main theme considers activities, meaning students' greatest perceptions of the student-centeredness stem from course activities in Chinese cases. Two sub-themes are contained, namely, engagement and interaction. Numerous sample students indicated that these courses provide more opportunities for them to participate and interact with teachers and peers in the course through various activities, mainly group discussions and presentations. These activities assist students in gaining an understanding of their own learning progress, their mastery of knowledge and skills, and their development through cooperative learning and practice. Overall, from the number of students' words, the factor of activities is the most significant and demonstrated students' core in teaching and learning.

The second main theme considers the teacher's belief, including four sub-themes, respect for the needs of students, role, relationship, and teaching goal. Under the influence of Confucianism, it is indeed a challenge to implement a student-centered approach in Asian countries, with the tradition of revering the teacher. In this regard, the teacher is in a superior position, and the students must obey the teacher. However, from the students' words, we observe that this former belief and practice is changing. In addition to teachers listening to students' needs and changing their role to that of facilitators and guides, Case E students described the teacher-student relationship as being equal. Moreover, the students indicated that the teacher took students' problems as the teaching goal (Case H). All of these behaviors originated from a shift in the teacher's beliefs. It is the second important factor for the student-centered course from students' views.

The third main theme considers the students' autonomy, consisting of three sub-themes, independent self-learning, gaining more authority, and leaving time and space for students. In all cases, students mentioned that they enhanced self-learning, active learning and collaborative learning due to possessing more autonomy and based on the time and space left by teachers. According to Li (2015), the majority of university teachers in China are conservative regarding

student autonomy. However, the finding revealed that this phenomenon changed in the student-centered approach. In particular, when students have greater autonomy, they are more driven to learn than those who have less control power (Du, 2020).

The fourth main theme perceived as important was the environment, comprising the interacting environment, various cultures (positive, negotiated, collaborative, harmony, and open-ended), and the "safe" environment. The course environment condition constrains student engagement and stress (Adams & Sargent, 2012). The result reaffirmed that the course climate determined the degree of students' participation. For example, in the case of E, students said the teacher built a positive atmosphere to encourage students to express their own opinions. Students in case G felt touched in the "safe" environment, in which even if the students do not do well in group work, the teacher can tactfully point out the shortcomings, without damaging students' self-confidence and give suggestions. Therefore, students hold that the appropriate environment is crucial in the student-centered approach.

The fifth and sixth main themes refer to the course content and assessment. In terms of the content, it encompasses four sub-themes: practical-oriented, flexible adjustment, related material, and related to students' experience. Generally speaking, although fewer students mentioned this aspect, we could observe from their words that the starting point for teachers to select and adapt content is the students, such as students' needs, interests, learning pace, students experiences. In particular, the flexible content adjustment is based on the formative assessment.

Regarding the assessment, it is made up of two sub-themes, formative assessment, and summative assessment. According to Zhong (2010), the formative assessment still faced significant challenges due to China's examination-oriented evaluation system. However, driven by the student-centered approach, the results show that this phenomenon has gradually reversed in the last decade. For instance, students indicated that the teacher paid attention, ongoing assessed their learning progress and provided immediate feedback after students shared. Moreover, summative assessment is necessary for Chinese classrooms, which is an institutional issue. In Chinese cases, despite efforts to promote formative assessment, conventional assessment has been consistently followed. Students receive a final mark at the end of the course, consisting of 70% of the final grade (exam or final presentation) and 30% of the regular grade (daily performance, assignments, attendance, and others).

There are also two factors that contributed to making students perceive the course as student-centered, namely, the teacher's emotions and competence. From students' answers, the teachers' patience and positive emotion would encourage students, which is also favorably connected with active learning and student achievement (Reyes et al., 2012). Besides, the teacher's emotions play a role in the course atmosphere, building the foundation of the course climate (Valiente et al., 2020). Regarding the teachers' competence, students in case G indicated that the teacher with various competence in teaching appealed to them. For instance, the slides are interesting and impressive. And the teacher's competence in explaining complex knowledge in an easy-understand way.

The researcher placed the main theme of stimulating students' development as the final topic since all the previously described main themes were intended for it, primarily through engagement. Three sub-themes are grouped, developing knowledge and skills, learning to think, and attitude. From students' perspectives, the student-centered approach was centered on development, such as

absorbing professional knowledge, developing initiative, problem-solving skills, independent learning, and an enthusiastic attitude to learning. Thus, this main theme is a crucial aspect of the student-centered approach in which students realize development in knowledge, skills, and attitude.

Table 51. Code-book of students' perception of the student-centered approach in Chinese cases

Main themes	Sub-themes	Example extract from cases
Activities	Engagement	The teacher spent the time four or five times during the course, and gave each student the opportunity to present for ten minutes on the podium (Case E); There were many group discussions and presentations (Case F); Students were required to interview and made a presentation independently (Case G); The teacher chose the theme, let the students participate in it, and make the presentation. Realize the combination of theory and practice (Case G); After explaining the relevant knowledge, the teacher would let the students go to podium to demonstrate and explain their own ideas. We have opportunities to present (Case H).
	Interaction	The teacher constantly asked the students some questions, and also put forward some exploratory questions for thinking (Case E); The teacher interacted with students (Case F); Encourage students to speak, and the interaction between teachers and students is strong (Case G); This course itself was practical, the teacher would let us go to the podium to perform and practice and ask us to explain the operation process, instead of the whole class being taught by the teacher alone. We had lots of chances to communicate with the teacher (Case H); Through group discussion, we often interacted with classmates and collaborative learning - worked in group and showed in group (Case H).
Teacher's belief	Respect for the needs of students	Because the teacher respected and listened to the opinions of the students (Case E); The teacher paid attention to students' learning and needs (Case F); The course was carried out based on the feedback of students (Case G); Listen and respect students' thoughts, focus on students' feedback (Case G); The teacher was very concerned about whether the student understood what she was teaching and often reflected on the problem from the student's perspective (Case H).
	Role	The course was mainly based on students' presentations,

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		supplemented by the teacher's inspiration and guidance (Case F); The teacher was the role of facilitator and guide. Stimulating students to think and ask questions by themselves (Case F); The teacher was a facilitator and guide. He paid attention to the interaction and guidance with students in the teaching process (Case G); The teacher was a guide. She talked about the operation process and gave guidance to the students (Case H).
	Relationship	Because teachers and students communicated on an equal footing (Case E).
	Teaching goal	Take student problems as the teaching goal (Case H).
Students' autonomy	Independent self-learning	Students designed and built micro-classes independently and simulate teaching in the course (Case E); Focus on students self-learning, active learning and mutual learning (Case E); We are autonomous to learn and present (Case F); Focusing on students' independent learning and inquiry (Case G); After the teacher's guidance and demonstration, the students were encouraged to explore, discuss and complete the exercises and homework on their own (Case H).
	Gain more authority	Give the students lots of authority (Case E); One-third of the courses were conducted by students, and the course was led by students (Case E); The course was conducted by students (Case F).
	Leave time and space for students	The teacher did not interfere with the performance of the students' presentation too much but provided enough space for the students to play (Case E); The teacher gave us a lot of time for autonomous discussion and encouraged us to share and express (Case F); The teacher left enough time and space for students to share and express their own views (Case G); Leaving time for the students to reorganize and digest knowledge and ask her what they don't understand (Case H); Students had enough time to think independently, cooperated and communicate (Case H).
Environment	Interacting environment	Frequent interaction with students, after the end of each class, "one lesson, one win" (Case E); The teacher created an interactive environment, where he always interacted with the students and answered questions to the students in time (Case F); The course climate was interacted (Case G); There were a lot of interactions between teachers and students

(Case H).

	Culture	**Positive culture**: The teacher built a positive atmosphere to encourage students to express their own opinions (Case E); The teacher actively encouraged students to express and discuss (Case F); It was a great climate. I like that the teacher cared and took photos during our presentation. It was very interesting, and I felt that the teacher listened carefully (Case G). **Negotiated culture**: The teacher negotiated with students (Case G). **Collaborative culture:** Teachers asked questions and kept asking, emphasizing collaborative learning (Case G); Discussion in group, and focus on collaborative learning climate (Case H). **Harmony culture**: It was harmony climate, and I felt it is good to solve the problems encountered with the teacher during the course (Case H); **Open-ended**: It was an open climate, we could present, ask and share something during the course. The choice of type of homework was also very free (Case H).
	"Safe" environment	In the teaching process, the teacher allowed us to interrupt to question or say something if we need (Case E); Allow students to express their doubts and think freely, at any time (Case F); The environment is "safe": even if we do not do well in group work, the teacher can tactfully point out the shortcomings, without damaging our self-confidence, and give suggestions, which is very heartwarming (Case G); The course was so relax, allowing students to express their opinions (Case H).
Content	Practical-oriented	The course content meet the needs of students (Case E); The content was practical, fit the educational reality, and broadened my horizons (Case G).
	Flexible adjustment	The content would be adjusted at any time according to the student's progress (Case E); The teacher would adjust the teaching content based on students' interests and needs (Case G); If the students did not fully understand after the teacher told us in the course, the teacher would repeat it again to deepen our impression and slow down the teaching process and the practical teaching according to the situation of the students, making it easier for us to understand and allowing students to have enough time to internalize (Case H);

		Adjust the content and teaching methods according to students' mastery (Case H).
	Related material	Many books and film and television works were recommended (Case G);
	Related to students' experiences	The content selected with similar life experiences of students (Case G); The content was close to the real-life (Case H).
Assessment	Formative assessment	**Assess learning progress**: The teacher paid attention to the student's learning progress and took the student as the leading factor (Case E); The teacher would adjust the course according to the student's learning situation (Case E); If we don't understand, we would look at the teacher, raise a small hand (not obvious), and make a negative gesture (Case G); The teacher focused on students at any time about their learning process (Case H). **Feedback**: Provide opportunities for students to present, and the teacher immediately gave comments and feedback (Case E); Students can raise their hands to indicate that they would like to express something, and then the teacher gave time for the students to ask questions or share their opinions, and finally, the teacher explained and gave feedback (Case G); The teacher evaluated students' presentations and put forward certain suggestions (Case G); Often let the students do the practical exercises by themselves, and let the students in the same group answer the questions at the same time, and the teacher gave comments (Case H). **Ongoing assessment**: The teacher continuously tested the student's learning and gave feedback and further guidance (Case H).
	Summative assessment	The teacher evaluated students' course designed skills through students' presentations at the end of the term (Case E);
Stimulate students development	Develop knowledge and skills	The teacher designed the curriculum for us to absorb the knowledge and develop the skills. There were also practical examples for students to "understand and use" (Case E); The teacher invited professional experts related to the course to supplement students' knowledge (Case E); There were some group cooperation parts, and there were about 5 weeks for the students to share and present their own research, developing students various skills (Case G); Develop our competence through group cooperation, interview, and presentation (Case G); The various knowledge in the course was to prepare for the

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		subsequent operation skills, and every operation involved students' participation so that students can learn knowledge (Case H);
		Teachers develop students' skills of taking the initiative to solve problems (Case H).
	Learn to think	When students were presenting, the teacher listened to them, "asks", and discussed like a student, to stimulate students thinking (Case F);
		There were plenty of time for thinking independently, and developing students independent thinking (Case G);
		During students' presentation, the teacher raised reflective questions and guided students to think (Case G);
		Through many ways to guide us in how to think (Case H).
	Attitude	The teacher would let the student make the presentation, not only limited to the teacher's teaching but also to maximize the enthusiasm of the students, improving one's own research awareness (Case G);
		The teacher always encouraged us and developed students' enthusiasm to learning (Case H).
Teacher's emotion	Positive emotion	The teacher was very patient with the students and has answered to students' questions (Case E);
		The teacher always encouraged us, patiently answered our questions (Case H).
Teacher's competence	Delivery approach	The course slides were interesting (Case G);
		The teacher expressed the difficult knowledge in an easy-to-understand way (Case G).

6.2.2 From teachers' perspectives: How do you view the concept of student-centered approach?

To understand the definition of the student-centered approach, teachers' perspectives were used to identify the connotation. In four Italian cases, there are three main themes, and nine sub-themes were grouped, as presented in Table 52. In the following, the researcher will analyze and discuss each of these themes, examining the student-centered approach in teachers' eyes.

The first main theme was that the student-centered approach fits within the dialogical approach to teaching and learning, which aligns with the previous findings (Perez, 2014). Several conditions need to be met in this dialogical approach to teaching and learning, including emphasizing practice and experience, listening to students' opinions, creating an open context, and focusing on students' autonomy and responsibility. In this regard, toward a dialogical, student-centered view of learning as a process of knowledge co-creation through encounters between student and teacher. It implies that it is also closely associated with the experiential learning approach and valuing the practice and experience (Dinesh, 2019). As one teacher said:

The student-centered approach fits within the dialogical approach since an approach that doesn't take who the student and the students are for granted. From that perspective, I think the point is to listen to a single student and a collective group of students. And to create an open

context, meaning that I start to acknowledge a student center approach whenever things are not pre-established from the beginning. In other words, I don't have to teach you today about Plato's full stop, especially not about what the book about later about Plato. But the students can start from where they are or find any way to relate common core issues to the reality and territory they are experiencing. So there is a big issue about autonomy and responsibility there (Italian teacher, IT-A).

The second main theme is regarding the value of the student-centered approach, containing three sub-themes: achieving the learning outcomes, facilitating learning, and promoting personal growth, which comes to developing students' competence. As academics stated, the competence-based approach is a student-centered, outcome-based approach to teaching and learning in which students master the required knowledge, skills, and attitude and foster personal progress (e.g., Henri et al., 2017). In line with previous perspectives, some teachers also indicated that:

I think that the value of the student-centered approach is for facilitating the learning process (Italian teacher, IT-A).

An approach that aims to enhance the student to promote personal growth rather than to transfer a set of knowledge to him (Italian teacher, IT-B).

The student-centered approach implies beginning from the end: what I want that my students are able to know and to do after my course (Italian teacher, IT-C).

The student-centered approach is thinking about the learning outcomes that they have to achieve by the end of the course. This means also knowing their previous knowledge about the topic, their needs, and their interests (Italian teacher, IT-D).

The last main theme considers the way of realizing the student-centered approach, encompassing two sub-themes, constructive alignment, and inductive teaching. On the one hand, constructive alignment is a pedagogical tool for designing student-centered instruction that aims to enhance learning through the amalgamation of constructivism (Tobiason, 2022). As the teacher posited:

The student-centered approach necessitates starting with the learning outcomes, requiring the conception and implementation of learning, teaching, and assessment methods aligned with the defined learning outcomes (Italian teacher, IT-C).

The constructive alignment contributes to the successfully implementing student-centered approach and better learning outcomes. However, there is also more time required to conceive the learning, teaching, and assessment activities, more materials to prepare in advance, and more time for the formative assessment (Italian teacher, IT-D).

Moreover, the teacher suggested that adopting the inductive teaching approach leads to the student-centered approach since the inductive teaching approach is a sort of discovery learning that focuses on the student. In inductive teaching tactics, students must analyze the information in front of them and draw logical inferences. Even if they are incorrect, this process improves their engagement in learning. It helps students comprehend the underlying logic more memorably. As the teacher expressed that view:

Realizing the student-centered approach implies the abandonment of frontal and deductive teaching, the adoption of inductive teaching, and the assignment of study and individual and collaborative activities (Italian teacher, IT-B).

Table 52. Code-book of teachers' interview of the understanding of student-centered approach in Italian cases

Main themes	Sub-themes	Number of data sources	Reference points
Fit within the dialogical approach	Emphasizing practice and experience	4	5
	Listen to students' opinions (needs and interests)	3	5
	Creating an open context	1	2
	Focusing on students' autonomy and responsibility	1	1
The value of the student-centered approach	Achieving the learning outcomes	2	4
	Facilitating learning	2	2
	Promoting personal growth	1	2
Way of realizing the student-centered approach	Constructive alignment	2	2
	Inductive teaching	1	1

To understand the student-centered approach from sample Chinese teachers' viewpoints, there are totally four main themes, and twelve sub-themes were identified, as summarized in Table 53.

The first main theme refers to course design and application considering the constructive alignment, which emphasizes reflecting the student's position. Five sub-themes were categorized: Focusing on student needs and previous experiences as the premise, activity design, environment construction, assessment design, and learning objectives. First of all, all the teachers in the Chinese cases suggested that respecting the diversity of students' needs and understanding their learning base is a prerequisite for course design and implementation. As the teachers in cases F and H said:

It is particularly important to pay attention to the student's learning basis, to listen to his or her deeper voice, and to put oneself in the student's shoes to assist their progress (Chinese teacher, CH-F).

Practically speaking, being student-centered means a lot to be done. For example, teachers need to recognize what kind of foundation each student has and their situation. Also, each student has his or her collective (class), and the atmosphere varies from different classes, which has to be more clearly understood. On this basis, it is then necessary to consider which methods are suitable for motivating students and promoting their reliance on themselves to build up their knowledge. Therefore, teachers need to be committed to course design (Chinese teacher, CH-G).

Knowing the diversity of backgrounds and needs of the students you teach is a precondition for designing and implementing a student-centered course (Chinese teacher, CH-H).

Moreover, taking into account students' needs, realities, prior knowledge, interests, and professional backgrounds, teachers believe that in student-centered course design, there is a need to return to activities and further connect them to elements such as the environment, assessment, and learning outcomes. In this sense, the student-centered approach is designed and carried out

around the core factor of activity. As the teachers described:

When students interact with their prior experiences and settings through practical activities, such a state helps them to become constructors of knowledge (Chinese teacher, CH-E).

The design of the course environment should also embrace a student stance, demonstrating a learning-centered, and designing around the learning in the classroom. What is a true student-centered position? It's student autonomy and academic autonomy, not teacher-centered and administrative-centered. And developing student autonomy demands an appropriate environment where content as clues connecting learning and where students are involved in learning, rather than the professor's position (Chinese teacher, CH-F).

The student-centered approach is more connected and reflected through teaching and learning activities, including instructional design, implementation, teacher-student interaction, assessment and evaluation, and subsequent liaison with students (Chinese teacher, CH-G).

In the teaching process, I pay attention to students' views and receive as much authentic feedback as possible, aiming to narrow the gap between the course's objectives and the students' expectations. I believe that this will gradually achieve a balance between meeting the needs of the students and achieving the learning outcomes as closely as possible (Chinese teacher, CH-H).

The second main theme refers to the value of the student-centered approach. In this aspect, three sub-themes were identified, namely, increasing knowledge and skills, developing the attitude to learning, and learning how to think. These values all point to the development of students' competence, meaning that this is the purpose of the student-centered approach. Moreover, from the teachers' words, we can observe that in addition to promoting the construction of students' knowledge, skills and attitudes, Chinese teachers placed greater emphasis on training students to think. This may be owing to the fact that the teachers are devoted to changing the learning ways in which students have long been accustomed to "sit to receive" knowledge in the traditional classroom. The prerequisite for motivating students to construct knowledge is to develop their autonomy and learn to think. As stated by the case G instructor:

I always believe that the most important thing to do is to stimulate students' active thinking. If students are willing to think, they will be able to digest the course content and construct their own perceptions (Chinese teacher, CH-G).

Each student is self-centered as each student learns something that is not precisely the same, which means constructing. Students construct a unique body of knowledge based on their own prior knowledge and continue to develop their knowledge, skills, awareness and values (Chinese teacher, CH-G).

The third main theme was to understand the concept in theory. According to the two sub-themes, the term student-centered approach is regarded as an ever-changing and systematic paradigm concept. On the one hand, the definition of the student-centered approach continues to be enriched as academic progress advances. It is an evolving concept, from Dewey's ideas to constructivism and even the viewpoint of decentralization that has been proposed in recent years. This sub-themes is in line with the philosophy and development of the student-centered approach concept previously mentioned in Chapter 2. As the teachers of cases E and G said:

For this concept, Dewey has always been referred to theoretically in the past, with the student's experience at the center of the process of learning. In this sense, the essence of learning is the continuous acquisition of learning experiences that increase one's knowledge. Later on, our

understanding changed somewhat. We combine this concept with constructivism, implying the recognition of the constructive nature of knowledge and considering students as subjects in the course to construct knowledge and develop competence as a process (Chinese teacher, CH-E).

My argument is that the student-centered approach is a process of "decentralization." Previously, both student-centered and teacher-centered were inclined to form antagonists. However, at the core of this "decentralization" is a constructivist, postmodern philosophy. It means that each student becomes his or her own subject and improves their cognition and skills in the course through the construction (Chinese teacher, CH-G).

On the other hand, the student-centered approach involves a variety of factors, which is perceived as a paradigm, implying that it is a systematic process rather than a one-sided concept. This theoretical viewpoint was mentioned in chapter 2, which is reconfirmed through the interview findings.

Table 53. Code-book of teachers' interview of the understanding of student-centered approach in Chinese cases

Main themes	Sub-themes	Number of data sources	Reference points
Course design and application are reflective of the position of the student (constructive alignment)	Premise: focus on student needs and previous experiences	4	6
	Activity design	4	5
	Environment construction	4	5
	Assessment design	3	4
	Learning objectives	1	1
The value of the student-centered approach	Increase knowledge and skills	2	4
	Develop the attitude to learning	2	4
	Learn how to think	1	2
Concept in theory	An ever-changing concept	2	4
	A systematic paradigm concept	1	1
Teaching and learning unfold through certain connections	Constructing knowledge through participation and interaction in activities	3	3
	A dynamic association	1	1

The last main theme is that teaching and learning unfold through certain connections related to the association between a student-centered approach and knowledge construction. The two sub-themes were grouped, constructing knowledge through participation and interaction in activities and a dynamic association. The first sub-themes emphasized that teaching and learning activities are the bonds between the student-centered approach and the student's construction of knowledge. The latter sub-themes held that teaching and learning activities exist as a dynamic property in the student-centered approach. As case G's teacher mentioned:

Student-centeredness is not to be taken literally or in terms of students' individual identity, role, or form of existence. However, it should be seen as the dynamic way students interact in teaching and learning activities. More specifically, when the student is learning knowledge, he

should be in the state of a knowledge constructor. When the student is engaged in practical activities, interacting with the environment and previous experiences, the student exists as a carrier. Therefore, student-centeredness is a dynamic relationship in which the student's knowledge, skills, and personality are developed and embodied through teaching and learning activities. Therefore, student-centeredness exists in a state of interactive and dynamic relationships (Chinese teacher, CH-E).

Table 54. Compare the students' perception of the student-centered approach in Italy and China

Main themes in Italy	Main themes in China
Teacher's belief: respect for the needs of students, commitment, role, starting point of course design, authority	**Activities**: engagement, interaction
Activities: engagement, interaction	**Teacher's belief**: respect for the needs of students, role, relationship, teaching goal
Students' autonomy: gain more authority, leave rooms for learning	**Students' autonomy**: independent self-learning, gain more authority, leave time and space for students
Environment: interacting environment, "safe" environment, culture	**Environment**: interacting environment, culture, "safe" environment
Assessment: formative assessment, summative assessment	**Content**: practical-oriented, flexible adjustment, related material, related to students' experiences
Content: practical-oriented, work-oriented	**Assessment**: formative assessment, summative assessment
Stimulate students development: knowledge and skills development, competence development	**Stimulate students development**: knowledge and skills development, learn to think, attitude
	Teacher's emotion: positive emotion
	Teacher's competence: delivery approach

6.2.3 "In between" conclusion and discussion

In this section, the researcher investigated the stakeholders to fully understand the meaning of the student-centered approach. This section compares the understanding of the student-centered approach from the students' perspective versus the teachers' perspective in different contexts, as shown in Tables 54 and 55. From the students' and teachers' perception of the term student-centered approach, we can identify some similarities and differences between the context in Italy and China. Moreover, compared with prior studies, the present study adds new perspectives, which are worth discussing. Last, as concluded in chapter 2, there has yet to be a consensus in terms of the student-centered approach, which is viewed as a meta-concept in this study. Thus, the researcher attempt to summarize the connotation from the voices of its stakeholders.

From the students' eyes regarding the term student-centered approach. Both Italian and Chinese students perceive and understand this concept more through practical experiences. As

shown in Table 54, the finding indicated that students' understanding of student-centered approach converged, even across cultures. Seven similar topics were mentioned by student participants, containing activities, teachers' beliefs, student autonomy, environment, assessment, content, and student development. This finding is congruent with the existing theoretical research on student-centered learning in higher education, which focuses on five components: the teacher's role, the function of content, the responsibility for learning, the purpose of assessments, and the power balance (Wright, 2011). In contrast, this empirical study demonstrates that in addition to the five confirmed characteristics, environment and student growth are also significant connotations of the student-centered approach from students' views.

In terms of the environment, many students see the merit and importance of student-centered environments. They recognized that the interactive, "safe" environment with appropriate course culture (positive, negotiated, collaborative, harmony, and open-ended) poses more opportunities for them to engage in the course. More importantly, the researcher noticed that, in the Italian context, the environment created by the teacher, as experienced by all cases students, was coherent with the instructional strategies the teacher primarily used. For instance, the students in case D reflected that the teacher constructed a collaborative culture, corresponding to the teacher mainly adopting the group work strategy during the whole course. As Biggs (2011) states, effective instruction requires constructive alignment to align learning outcomes, activities, and assessments. Based on the findings of the study, the researcher asserts that the environment should be incorporated and viewed as an aligned element. In this sense, it is necessary to design an environment consistent with the employed educational strategy, such that learning outcomes, activities, and assessments align with the environment, realizing effective teaching and learning.

Compared to the traditional five elements, the student's other different connotation from the student-centered approach is student development, including knowledge and skills, attitude, learning to think, and others. Combined with the teacher's understanding – of the value of the student-centered approach (Table 55), both teachers and students agree that the course activities and content need to give students knowledge and skills development that are applicable to their present and future life. Learning for students is not about memorization but about acquiring skills, attitudes, and mindsets useful for their professional and personal lives. Consequently, in the views of teachers and students, some elements, like activities, assessments, and course content, are all devoted to fostering student development, which is one of the most important aspects and the purpose of the student-centered approach.

In addition, although the views of students from both cultures are pretty comparable, there is also some subtle difference reflecting on the order of main themes and the content of sub-themes. On the one hand, these main themes are ordered according to the number of student responses, contributing to revealing which of these factors is more evident than the others. Apparently, in the Italian context, the teacher's belief is the most significant factor and the starting point of the student-centered approach. Students claimed they would gain more autonomy if their teachers held student-centered ideas. The Chinese students had a similar opinion: "The relationship between teachers and students would be more equal." It appears that students are aware that the student-centered approach is a way to promote a balance of power. In fact, even with the negotiated course culture, the professor still makes the majority of decisions, and neither students nor faculty appear to mind this arrangement. Certainly, this can be somewhat explained by

hierarchical culture and high power distance, especially in Asian countries. However, the majority believe that differential power is necessary and does not conflict with student-centered philosophy (e.g., Trinidad, 2020). In comparison, in Chinese students' perspectives, activities are the utmost in the student-centered approach, which provides them more opportunities to participate in the course, as the course scale in China is larger. Thus, it could be argued that the student-centered approach is understood as creating engaging and interactive activities. Besides, individual Chinese students mentioned that the teachers' patience, positive emotion, and digital competence in presenting the content made them more engaging.

Table 55. Compare the teachers' understanding of the student-centered approach in Italy and China

Main themes in Italy	Main themes in China
Fit within the dialogical approach: emphasizing practice and experience, listening to students' opinions (needs and interests), creating an open context, focusing on students' autonomy and responsibility.	**Course design and application are reflective of the position of the student (constructive alignment)**: focus on student needs and previous experiences (premise), activity design, environment construction, assessment design, learning objectives
The value of the student-centered approach: achieving the learning outcomes, facilitating learning, promoting personal growth	**The value of the student-centered approach**: increase knowledge and skills, develop the attitude to learning, learn how to think
Way of realizing the student-centered approach: constructive alignment, inductive teaching	**Concept in theory**: an ever-changing concept, a systematic paradigm concept
	Teaching and learning unfold through certain connections: constructing knowledge through participation and interaction in activities, a dynamic association

On the other hand, regarding the difference in sub-themes, despite the fact that students from both countries mentioned that their opinions were respected, in the Italian case, the teacher even made a commitment that increased students' confidence and gratification. Moreover, regarding the sub-themes of students' autonomy and student development, the researcher noticed that the students' mind training and self-learning are particularly emphasized in the Chinese context. Since the Confucian values and Chinese tradition of conformity and receptivity to authority (Thanh, 2010), students were inclined to be reluctant to offer criticism of imparted knowledge (Du, 2020). Therefore, the Chinese teachers tried to shift this status and encourage students to think and construct their own learning.

Overall, returning to the purpose of this section, the research aims to summarize how university students in different contexts interpret the student-centered approach differently. Therefore, in the Italian students' eyes, the student-centered approach is:

An effective strategy that starts with the teacher's beliefs, in an intertwined combination and alignment of activities, environment, course content, and assessment to promote students'

autonomy and competence development.

From Chinese students' perspective, the student-centered approach is:

A means to promote a power balance between the teacher and student, as well as a set of pedagogical strategies and practical techniques that, mainly through creating engaging activities and a combination of various factors, promote students' autonomy, independent thought, and competence development.

From the teachers' perspectives regarding the term student-centered approach. Unlike students who perceive the approach from a practical side, the sample teachers are from education disciplines and possess student-centered beliefs and instructional experiences. As such, teachers view the concept of the student-centered approach from theoretical and practical aspects. As displayed in Table 55, the finding showed that although teachers' understanding of the student-centered approach is significantly different, all involve three aspects regarding course design, way of implementation, and value.

It is evident that both in the Italian and Chinese context, the most similar topics mentioned by sample teachers were the value of the student-centered approach, which aligned with students' perceptions, were adopted for increasing the learning outcomes (knowledge and skills), improving learning, attitude, and independent thinking. In a word, the purpose is to promote personal growth.

Moreover, another common view of the student-centered approach was that it was achieved through constructive alignment. However, the researcher examined the teachers' discourse and found that the two cases emphasize different orientations. Concretely, in the Italian context, constructive alignment highlights the need to start from the learning outcomes. While in China, there is no explicit reference to the starting point, but place greater emphasis on linked to the activities. Of course, a Chinese teacher also suggests the connection between teaching objectives and student needs. However, from this kind of linking, we discovered that it is just connecting, combining rather than aligning, and teaching objectives instead of learning outcomes. The conceptual uncertainty tends to lead to fragmented or failure in practice.

In addition, Italian and Chinese teachers present different perspectives on understanding the student-centered approach, though the views are related to the course design and delivery. In terms of the specific views, we analyzed and discussed them in detail in the previous section (chapter 6.2.2) according to the main themes and sub-themes, and we will not repeat them here.

To conclude, from Italian teachers' viewpoints, integrating theoretically and practically, the student-centered approach, as a meta-concept, is understood as the following:

(1) *Student-centered approach fits within the dialogical approach, as a process of knowledge co-creation between teachers and students, emphasizing practice and experience, listening to students' ideas, and creating an open context.*

(2) *Student-centered approach is a competence-based and outcome-based pedagogy, aiming at achieving the learning outcomes and promoting personal growth.*

(3) *Student-centered approach requires starting with the learning outcomes, requiring the conception and implementation of learning, teaching, and assessment methods aligned with the defined learning outcomes.*

From the Chinese teacher's eyes, the student-centered approach is explained in the following aspects:

(1) *The student-centered approach is an educational method possessing the student stance,*

and is designed and implemented around activities, combining environment, assessment, and learning objectives, under the premise of understanding students' diversity and needs.

(2) *Student-centered approach is a competence-based pedagogy, aiming at increasing students' knowledge and skills, improving their attitude, and promoting independent thought.*

(3) *The student-centered approach is an ever-changing and systematic concept with the dynamic attributes.*

6.3 Student-centered course design, delivery and assessment: Practical experiences to promote students' competence development

6.3.1 From Italian teachers' experiences: How did you contribute to students' competence development through the student-centered course?

In the Italian cases, seven main themes were identified and grouped regarding how to develop students' competence through the student-centered approach, from the teachers' practical experiences: Multiple activities, through questions to facilitate thinking, teacher's non-judgment attitude, learning from feedback, considering the contexts of students and their class, climate, and teacher's competence. For a more detailed description, Table 56 shows the sub-themes, number of data sources, and reference points.

According to the teacher's words, the researcher noticed in the coding that most of the teachers in Italy align various elements rather than a fragmented application that integrate to enhance the development of students' competences in the courses. Therefore, to more explicitly examine and render teachers' practical experiences, the researcher will interweave and integrate specific cases with various elements of main themes and sub-themes to elaborate, analyze and discuss, instead of strictly following the sequence of main themes.

First, many teachers started with the main themes of considering the contexts of students and their class, including students' prior experiences and class scale, which is the premise of the student-centered approach, mentioned in the previous section. Teachers indicated that it is important to recognize their present learning base and experience before deciding how to increase students' competences. Students with varying knowledge and abilities and in different class sizes mean that the teaching and learning strategies, delivery, environments, and others adopted will be different. As teachers' in Case A said:

The students in my course were in their third year of becoming experts of training. Their horizon is broad, with lots of theories but little practical experience. How to help them achieve? My preferred option is to promote their practical skills and active reflection through questions, in an open-ended environment. Before reflecting and thinking, I introduce the very practical knowledge and skills to them, and encourage them to reflect upon learning – what worked or did not, and why. Even, I granted the authority to students to organize activities, like managing Moodle with peers, to train students' planning, running, and practical skills, which are the most related practical experiences. But I would say, I wouldn't do it in the first year, and not in this way.

Moreover, the number of students in a course is also a factor influencing the development of their competencies. Case A, with 17 students, has the smallest class size among all the samples. And the instructor stated that it is a privileged position in this course due to the fact that there are few students which imply more opportunity to engage. Although Biggs (2011) suggested that

competent teachers who fully deployed constructive alignment strategies could provide effective teaching and learning regardless of class size, numerous empirical studies demonstrated that smaller classes led to higher academic learning progresses, increased student knowledge, and improved classroom processes (e.g. Brühwiler & Blatchford, 2011; Tight, 2020).

Next, in terms of the main theme, "through questions to facilitate thinking," three sub-themes were grouped, containing opportunities to share reflective ideas, adhere to teachers' responsibilities and roles, and reflect (thinking) based on learning. As the first and third sub-themes have been mentioned before, the researcher mainly focuses on the second one. Facilitating students' autonomy in learning and thinking tends to grant some authority to students, but it is not equal to giving up or ignoring the teachers' responsibilities and roles. In other words, students' autonomy in learning and thinking does not entail independence from teachers and self-education. Instead, teachers provide some core knowledge and skills to students, leaving room for their active and independent learning, and co-construct the knowledge as the facilitator and guide. It reflected the acknowledgment of instructors' and students' interconnectedness in knowledge formation and the intrinsically social nature of learning (Bandura & Walters, 1977). As the teachers described:

There is first a big question that I don't give up my responsibility about what we know about technology, but I try to make them think, and I encourage them to reflect upon it. more important, I introduce them to very practical. And I consider effective group dynamic technique in the first days. And on the basis of that knowledge and experiences, I encourage them to do two things. One is to reflect upon the learning, and the second is to encourage them to practice (Italian teacher, IT-A).

A supportive relationship should be formed. The teacher provide the important knowledge to students and help them to understand and facilitate their thinking, while carry out the activities for students learning by practical experiences (Italian teacher, IT-B).

The student-centered approach does not make teachers redundant. The teachers' roles are as facilitators and guides. In my course, I make some theoretical lessons at the beginning. The students conduct all other lessons following the flipped classroom method, while I underline the deepen aspects if it is not done enough by the students. In this way, students could be more active and involved in the course, thereby developing competence (Italian teacher, IT-C).

Before the course, I will prepare materials to make the students work and learn by doing. For example, I prepared a document in advance (it could be an article to read, a video to watch, ...), the students have to read or watch it at home and we discuss it in class, sharing opinions and co-construct knowledge altogether. In this regard, My role is as a coach, mentor, and facilitator (Italian teacher, IT-D).

The following two main themes turn to multiple activities and learning from feedback. As displayed in Table 56, multiple activities refer to the purpose of various competence development. While learning from feedback considers, particularly from the teacher and peers. Teachers demonstrated that students could achieve better learning through different activities and yield rich experiences, especially in practical and general skills. Round after round of feedback from teachers and peers will contribute to the continuous development of new perceptions as well as the construction of new knowledge and skills. Besides, the teacher indicated that the activities need to be aligned with the student's needs and abilities. As the teachers said:

Students could be developed through the different activities. For example, your first experience makes you judge that technology in a certain way, but then you're biased by the most relevant feature. And then, by having more similar experiences with similar technology, you start to see the 360 degrees. So variety and activities are very important (Italian teacher, IT-A).

I try to get the most out of the students by offering activities commensurate with their needs and abilities (Italian teacher, IT-B).

Table 56. Code-book of experiences of Italian teachers devoted to developing students' competence in the student-centered course

Main themes	Sub-themes	Number of data sources	Reference points
Multiple activities	Constantly renew students' knowledge and skills	4	8
	Develop students' professional and practical skills, gaining related experiences (learning by doing)	4	8
	Stimulate responsibility and active learning	3	3
	Develop general skills	3	3
	Activities commensurate with students' needs and abilities	3	3
Through questions to facilitate thinking	Opportunities to share reflective ideas	3	7
	Adhere to teachers' responsibilities and roles	4	5
	Reflect (thinking) based on learning	3	5
Teacher's non-judgment attitude	Students' autonomy (judge and decide by students)	4	9
	Push students in a comfortable way	4	4
Learning from feedback	Feedback from peers	3	5
	Feedback from the teacher	3	6
Considering the contexts of students and their class	Students' prior experiences	4	8
	Class scale	1	1
Climate	Open-ended climate	3	3
	Safe climate	3	3
	Friendly climate	2	2
	Collaborative climate	1	1
Teacher's competence	Teacher training	3	5

The main theme regarding climate is one of the most important factors in the student-centered approach. In line with the Italian students' perceptions mentioned in section 6.2.1, in practical experiences, the teacher created the kind of environment aligned with their instructional strategies. For example, the teacher of case A primarily facilitated students' thinking

through questions, corresponding with the open-ended climate built. The teacher of case B developed a "safe" climate for students to feel free to express themselves. This kind of climate values their inclinations and strengths and considers mistakes as part of the learning process, which fits with active learning and experimental learning strategies. For case D, the teacher mainly adopted group work, aligned with the collaborative climate established. In case D, the teacher created a friendly climate appropriate for the flipped classroom. The adjective Friendly seems too abstract, specifically, as the teacher in case C explained:

I try to create a friendly climate where students are conceived as adults and peers in a non-symmetrical relationship. Their formal, non/informal knowledge is as important as academic knowledge, and I try to valorize it. They feel confident to express their opinions and participate. I encourage their engagement and involvement from the beginning till the end of the course – flipped classroom. Moreover, a positive and friendly learning environment is a key starting point for the success of the course in terms of satisfaction and learning results. However, as I said, the climate is just a starting point, but it is not the only cause of a deep approach to learning that depends above all, on the teaching, learning, and assessment activities proposed (Italian teacher, IT-C).

Concerning the main theme of teacher's competence, it is argued that the teacher should have strong belief and competence in active teaching, learning, and assessment. Therefore, it is necessary for teachers to attend training activities to update their methods, especially those unfamiliar with the knowledge of teaching and learning. Through a student-centered approach, the competent teacher is able to assist students' personal growth. However, if executed improperly, a student-centered approach can be detrimental to the course (Pedersen & Liu, 2003; Tadesse, 2020). In this regard, teachers in the Italian context appealed that:

Consider teacher training, it allows you to touch the potential of the student-centered approach (Italian teacher, IT-B).

My constant studies of this topic have helped me a lot to change the learning, teaching, and assessment methods that I use with my students. For teacher training, the teacher should try the student-centered approach on himself. I don't think we can teach the student-centered approach in a traditional way. A teacher should try the difference doing like flipped classrooms, and problem-solving on this topic: in this way, he can learn a different way to teach by learning in a different manner (Italian teacher, IT-C).

Last but not least, teachers claimed that their attitude toward the student-centered approach and developing students' competence is the most important thing. The attitude, which is regarded as the teacher's belief in the Italian students' eyes, is understood as the starting point of the student-centered approach. From the teacher's words, the main theme is categorized as the teacher's non-judgment attitude, with two sub-themes of students' autonomy (judging and deciding by students) and pushing students in a way that made them comfortable and acceptable. As stated by teachers:

I literally never say what is right or what is wrong, but I rather encourage the other students to provide feedback about what was relevant for them. And then I present sometimes alternatives, things that could have been shorter or longer going deeper, wider, without saying "this works or doesn't work", and trying to be really not judgmental, and always starting from the positive aspects that you can acknowledge in activities that they propose. I think this is the attitude. You

doing this is also very important. So there is like a double message needed to judge by themselves (Italian teacher, IT-A).

I always negotiate every step with the students from the beginning and respect their decision and judgment. For example, students can choose the topic they are more interested to present to others or they can choose the content of their working groups. I tried to push them to express themselves, to get out of their comfort zone, but not into any panic zone *(Italian teacher, IT-C)*.

I adopted the group discussion in the course, since it's not that I'm trying to get some kind of preconceived answer for them, but to knowledge, the different impacts that specific experience can have upon some of the students (Italian teacher, IT-D).

Table 57. Code-book of experiences of Chinese teachers devoted to developing students' competence in the student-centered course

Main themes	Sub-themes	Number of data sources	Reference points
Help students make connections to knowledge	Clarify course learning objectives and content	3	3
	Develop students' knowledge and cognition	1	3
	Designing the knowledge sequence of the course	2	2
	The choice of material	1	2
	Adhere to the teacher's responsibilities and roles	1	1
Learning by doing through activities	Aligning the knowledge trait to activities and teaching methods	2	5
	Develop practical skills based on knowledge	2	3
	The implicit and explicit interaction: Synergistic development of knowledge, skills, personality, and professional competence.	1	3
	Foster students with independent thinking.	1	1
Environment	Physical environment (classroom layout, class size)	2	3
	Interpersonal environment (teacher's discourse style, attitude, teacher-student relationship, etc.)	2	4
Consider students' contexts	Students' prior experience and knowledge	2	4
	Student age and stage of study	1	1
	Seeking commonalities in students' needs	1	1
Assessment based on constructivist design	Negotiate and agree on the assessment standard orientation	1	1
	Design and application of non-standard dynamic assessment methods	1	2
	Formative assessment throughout the whole course (ongoing feedback, assignment feedback, and activity feedback)	1	1

6.3.2 From Chinese teachers' experiences: How did you realize students' competence development in the student-centered course?

In the Chinese instances, five main themes were grouped and examined in terms of how to achieve students' competence in a student-centered course, based on the teacher' practical experiences: helping students make connections to knowledge, learning by doing through activities, environment, considering students' contexts, and assessment based on constructivist design. Table 57 provides a full overview of the sub-themes, the number of data sources, and reference points.

First, the Chinese teachers made efforts to help students connect to the knowledge, which is significant to achieve their intended learning outcomes. Six sub-themes were identified, including clarifying course learning objectives and content, developing students' knowledge and cognition, designing the knowledge sequence of the course, the choice of material, and adhering to the teacher's responsibilities and roles. Connecting students to knowledge is an interlocking process.

Specifically, teachers suggested that clarifying to students the primary learning tasks of the course and understanding what knowledge needs to be acquired is a prerequisite for making connections to knowledge. In this sense, Chinese teachers tend to articulate the intended teaching objectives and ways to achieve them to their students in the first class. And the teacher believed that it is their responsibility needed to adhere. As teacher in Case E stated:

It is important to make it clear to students that the purpose of the course is to develop knowledge. It's also a response to one of the biases and misconceptions we've always held about student-centeredness – that student-centeredness is about student-directed activity, subjective or direct experience. That shouldn't be the case. The student-centered approach was adopted to serve students, making effective connections to knowledge. Thus, in the first class, I convey to students what kind of body of knowledge and core knowledge covering in this course (Chinese teacher, CH-E).

However, this is only verbalized by the teacher, and no syllabus is generated. Although universities require teachers to complete documents such as lesson plans, these are not publicly accessible. Indeed, for some students, the intended learning outcomes are still ambiguous (Yang & Ge, 2022).

Moreover, teachers perceive a need to consider developing students' new cognitive and practical skills based on their prior knowledge. In this sense, establishing connections between students and their knowledge is a developmental and constructive process, not an indoctrination. Regarding how to develop the student's knowledge, it entails the issue of knowledge sequence during the course. The type of knowledge determines whether the instructor begins with general information and progresses to more highly structured knowledge or vice versa. Furthermore, some teachers even consider from the students' stances, referring to various materials and authority textbooks, aiming at finding a way to assist students in better understanding. As teachers said:

It is difficult for students to really understand and accept areas that they are less exposed to if they are very highly structured at the beginning. But by the end, the teacher can show the students that the intellectual order of the course is deliberate and logical. Thus, in the first session, I started with general information and was introduced to what the course is divided into sections. Until the last class, I talk about classical and modern theories. In this pathway, students can first build up their knowledge. When the teacher then talks about theories, the students are able to use their own system to organize and relate the theories so that they can organize and construct their own body of knowledge around the foundations they already have (Chinese teacher, CH-G).

Second, the main theme refers to learning by doing through activities, encompassing four sub-themes, aligning the knowledge trait to activities and teaching methods, developing practical skills based on knowledge, the implicit and explicit interaction to synergistic development of knowledge, skills, personality, and professional competence, and fostering students with independent thinking. The finding suggested that, in teachers' experiences, the activities are the core element of the student-centered approach, as well as an effective and constructive way to develop students' competence. In detail, the following provides some practical examples.

In my course, I will explain to students what knowledge is more applicable to a lecture approach and what is more suitable for inquiry, using the group work method. My course was more through lecture, because abstract and deep knowledge is difficult to achieve through group discussion and having students do literature reading (Chinese teacher, CH-E).

There are two layers of interaction. On the one hand, lecturing is an implicit interaction. The student's choice of knowledge and information is audible and interactive. For example, I develop the course concerning the student's interests, so that the student feels that the knowledge is valuable and relevant. In that case, he will raise his interest in listening to the lecture. This process may seem passive, but it is actually an active process of interacting with the information. This means that the lecture can be adapted to the students to achieve a deep interaction between the teacher and the students, an implicit interaction. Explicit interaction, on the other hand, is what we know as substantive and real interaction, such as sharing opinions and presentations. Combining implicit and explicit interactions can synergistically develop students' knowledge, ability, personality, and others (Chinese teacher, CH-E).

In addition, we have found from the experience of Chinese teachers that a commitment to student-centered teaching and learning not only develops students' knowledge and skills and promotes their independent thinking, but also makes teachers rewarded, which is known as teaching for learning. In this regard, as the teacher and students grow together, the student-centered approach will be more firmly adopted and put on the track of effective teaching and learning. As the teacher at case G interpreted:

My boldest and favorite experiment this year was to have all the student groups do the same topic in a presentation. Since both the teacher and the students are familiar with the topic, the teacher will listen especially carefully and give targeted feedback. The students know each other's content well enough to compare them with each other and listen to different perspectives and conclusions. Through different comparisons, both teachers and students will find a lot of interesting and valuable things (Chinese teacher, CH-G).

Through accumulation and practice, students form their own independent views and opinions, which is different from traditional university education that forms a general understanding. Because the goal of modern university education is for students to develop into independent thinkers with unique perspectives and approaches to understanding social issues, with the ability to think critically and draw their own conclusions (Chinese teacher, CH-G).

In addition, teachers are rewarded from students' projects and are able to lay the foundation for their own research on the subject, which is also constructive. So I prefer to explore and experiment in the classroom, constantly adjusting the methods and content (Chinese teacher, CH-G).

Third, the main theme considers the influence of climate on students' competence

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development. Two sub-themes were mentioned, containing physical environment and interpersonal environment. We have been discussing the interpersonal environment, such as a safe, positive one, and such. Deeply, the interpersonal climate is created by the instructor's personality, attitude, and discourse style and serves as the underpinning of the course culture. In the student-centered course, the attitude and style toward dialogical will be more suitable, which is also more beneficial in students' competence development. As stated by the case F teacher:

In practice, the teacher's discourse indicates the style and attitude. Instead of letting students listen to you, the student-centered course is more about a relationship of mutual interpretation and shared dialogue. In implies that students will observe your tone and style to capture and judge whether the teacher is genuinely willing to dialogue or pretend to dialogue (Chinese teacher, CH-F).

On the other hand, the need to consider the physical environment was pointed out in the Chinese context. Compared to Italy, the Chinese course size is relatively large. Thus, there are more challenges in implementing the student-centered approach. As a teacher said:

The kind of classroom we have now is actually still a physical layout that emphasizes teacher-centeredness. On the contrary, student-centeredness tends to be a discussion style that includes relatively small class sizes. It is very significant that the physical environment (classroom) should be designed in a way that facilitates discussion, cooperation, and interaction among students (Chinese teacher, CH-F).

The fourth main theme refers to considering students' contexts, with three sub-themes: students' prior experience and knowledge, student age and stage of study, and seeking commonalities in students' needs. From the teachers' discourse, it is evident that the role of this main theme for students' competence development is consistent with that in Italy, i.e., knowing the students' context can be beneficial in helping students to construct new knowledge and develop practical skills based on their previous experiences. In addition, the teacher in case H expressed the objective limitation that the needs of all students cannot be fully met in a course with a huge class size. In such cases, teachers tend to ensure a baseline bottom line for instruction based on an understanding of the commonalities of student needs.

Finally, the most noteworthy main theme is that of assessment based on constructivist design. Three sub-themes are grouped, including negotiating and agreeing on the assessment standard orientation, design and application of non-standard dynamic assessment methods, and formative assessment throughout the whole course (ongoing feedback, assignment feedback, activity feedback, and end-of-term feedback). Looking at all the cases, very few teachers and students discussed the assessment in depth, due to the formative assessment taking a lot of time and effort. Thus, the aspect of assessment was not as readily apparent for both students and teachers.

Moreover, very few respondents stated the purpose of the assessment. In addition to the feedback during activities, the majority of their ideas still focus on assessment as a means for students to get their final grades (Trinidad, 2020). Most view course assessment as a test of how much students have gained in terms of knowledge or skills. However, little is said about how these assessments are employed as educational tools to help students learn more deeply (Wright, 2011). In this sense, it is significant studying how the instructor utilized assessment to "teach" knowledge and skills in the same manner that students learn through course assessments. The following are specific experiences from case G teacher on how to use constructive formative assessment.

Non-standard assessment criteria. *"I would not use a uniform standard to evaluate students. I will explain this to the student. This means that when the student has reported back, I will not assess the student with a uniform standard (e.g., you get a 90, he receives an 80). This constructivist character comes through when I am designing the assessment."*

Learning by doing, constructing new cognition. *"Before engaging students in hands-on research, I will spend a class period giving training to students, providing a few key pieces of information, but not talking about everything. Instead, when the students come back from doing the survey, I will comment on their presentation, pointing out the students' problems, then the students will be able to have a more profound impression of the knowledge."*

Dynamic assessment criteria toward fairness. *"Moreover, the students who have yet to present will know immediately whether they have the same problems and improve in time. In this case, the students who present later definitely have an advantage, but they may not get a higher score because I will be evaluated with the new criteria (a higher standard)."*

Constant construct new cognition and experiences. *"Therefore, my course is essentially a constructive course that allows students to keep learning and accumulating new knowledge and experience through this constant presentation review and feedback on similar topics and through the cases of previously reported students. So each group of students can learn something from the previous group's debriefing while listening, which is actually a very typical constructivist design."*

"I will tell them that the course itself is constructed, not only "learning from doing" but also "learning from mistakes," making mistakes, and then improving. I think this method has been quite effective in the past two years of practice."

Ongoing feedback and assignment feedback. *"I consistently write some feedback to my students every year. Last year with over 100 students, there were about two dozen group assignments, and I would write assignment feedback for each group, probably one or two thousand words each, in a very fixed format, and I would mention each part of each report. I've been doing this since my first year, often staying up until 2 or 3 o'clock, but I hope the feedback will help the students learn. I would give the feedback to the appropriate group leader and make sure that the group members did not read it to each other, so that each student's privacy and emotions were taken care of."*

"As for individual assignments, students will write about their ideas about readings, and I will write feedback. However, due to time constraints (tens of thousands of words in total), I had time to write the feedback after the student finished the teaching evaluation (grading), then give the feedback to students. Hence, this is also constructive and student-centered. Thereby, each person can receive feedback and thus facilitate student learning."

6.3.3 "In between" conclusion and discussion

In this section, to more profound understand the way to improve students' competence development, the researcher examined the teachers' practical experiences to promote students' competence development in the student-centered course. As presented in Table 58, there are similarities and distinctions between the experiences of Italian and Chinese teachers. The factors in common contain activities (learning by doing), considering students' context and environment (interpersonal). Moreover, their differences are not antagonistic but complementary. In this regard,

the pathway toward students' competence development has many roads. Thus, the researcher intends to summarize the effective experiences of teachers thereby providing some implications.

Table 58. Compare the teachers' understanding of the student-centered approach in Italy and China

Main themes in Italy	Main themes in China
Multiple activities: constantly renew students' knowledge and skills, develop students' professional and practical skills, gain related experiences (learning by doing), stimulate responsibility and active learning, develop general skills, activities commensurate with students' needs and abilities	**Help students make connections to knowledge:** clarify course learning objectives and content, develop students' knowledge and cognition, designing the knowledge sequence of the course, the choice of material, adhere to the teacher's responsibilities and roles
Through questions to facilitate thinking: opportunities to share reflective ideas, adhere to teachers' responsibilities and roles, reflect (thinking) based on learning	**Learning by doing through activities:** aligning the knowledge trait to activities and teaching methods, developing practical skills based on knowledge, the implicit and explicit interaction: synergistic development of knowledge, skills, personality, and professional competence, foster students with independent thinking.
Teacher's non-judgment attitude: students' autonomy (judge and decide by students), push students in a comfortable way	**Environment**: physical environment (classroom layout, class size), interpersonal environment (teacher's discourse style, attitude, teacher-student relationship, etc.)
Learning from feedback: feedback from peers, feedback from the teacher	**Consider students' contexts:** students' prior experience and knowledge, student age and stage of study, seeking commonalities in students' needs
Considering the contexts of students and their class: students' prior experiences, class scale	**Assessment based on constructivist design:** negotiate and agree on the assessment standard orientation, design and application of non-standard dynamic assessment methods, formative assessment throughout the whole course (ongoing feedback, assignment feedback, and activity feedback)
Climate: open-ended climate, safe climate, friendly climate, collaborative climate	
Teacher's competence: teacher training	

From Italian and Chinese teachers' viewpoints, teachers have accumulated a lot of effective experiences in promoting students' competence development. And these experiences are able to mutually useful, as concluded in the following. Specific examples of how to apply these lessons

are provided in the first two sections of 6.3.

(1) Consider students' contexts before course design, including their prior experience, possible needs, interest, and even the class size.

(2) Aligning knowledge and skills with appropriate activities, realizing learning by doing, and synergistic development of knowledge, practical skills, and attitude toward active learning and thinking.

(3) Create a suitable course environment, aligning with activities and assessments in teaching and learning, from both interpersonal and physical aspects.

(4) Assessment based on constructivist design: negotiate and agree on the assessment standard and application (can be flexible and dynamic), formative assessment throughout the whole course (ongoing feedback from teachers and peers), and finally summative assessment.

(5) Through questions to facilitate students' thinking and reflection.

(6) The non-judgmental attitude of the teacher allows students to make some judgments and decisions by themselves and pushes students in an acceptable manner.

(7) When the course is theoretical, assist students to make connections to knowledge through clear intended learning outcomes, designing the knowledge sequence, appropriate materials, activities, and assessment.

(8) Adhere to the teacher's responsibilities and roles. The student-centered approach doesn't mean independence from teachers or self-education. Teachers teach students core knowledge and abilities, leaving room for active and independent learning, and co-construct knowledge as facilitators and guides.

(9) Attend the teacher training activities to update their minds and methods, which can help teachers a lot to improve their learning, teaching, and assessment methods.

Even though the teachers' various experiences in the two cultural contexts don't contradict, the researcher noticed topics worth emphasizing and differences worth discussing from the lines in the teachers' discourses.

First of all, sample teachers on both sides emphasized the necessity of devoting to eliminating biases and misconceptions about the student-centered approach. The incorrect or improper implementation of the student-centered approach not only fails to foster students' competence, but also has a negative effect on the classroom (Tadesse, 2020). In light of this, we must reiterate that teacher practices such as supporting student autonomy and delegating some authority to students do not equate to the abdication of responsibility and position. The student-centered approach entails teachers co-constructing knowledge with students as mentors, facilitators, or guides. It acknowledges the interconnectivity of teachers and students in knowledge development and the inherently social aspect of learning (Bandura & Walters, 1977). In other words, there is no disputing the fact that there is explicit theoretical knowledge as a basis in the classroom. Regarding how to organize the ratio between lectures and other interactive activities will be determined by the nature of knowledge, students' prior experience, needs, and other factors.

Both Italian and Chinese teachers recognized the importance of teaching and learning activities for students' competence development. The researcher would like to highlight three points. Regarding students' competence development, which includes learning outcomes, general skills, and attitudes, we observed that both Italian and Chinese teachers placed particular emphasis

on knowledge construction and active thinking (attitudes) in the student-centered approach. Additionally to activities, keeping the constructive alignment throughout the course design and implementation process contributes more to effective teaching and learning, including aligning learning outcomes with activities and assessments. Many previous studies demonstrated this view (e.g., Biggs, 2011; Chan & Lee, 2021). Moreover, little mention of how assessment can be used to help students learn deeply and develop competences (Trinidad, 2020). Therefore, the researcher strongly recommends referring to the teacher's practices of Case G as an excellent example of how teachers apply constructive formative assessment.

In addition, from the teachers' discourse, the researcher compared the implementation of the student-centered approach in two different cultures and contexts and found some various phenomena.

For one, the class size distinctly differs in the sample Italian and Chinese cases, due to national objective factors such as demographic issues. The consequence is that implementing the student-centered approach in a Chinese context will be more challenging. Specifically, the Italian case A had only 17 students. Hence, the teacher considered this as an enabling factor for the students to engage and interact more and promote their competence development. In contrast, none of the four cases in China had less than 30 students in the course, typically around 50. Much empirical research has proved that smaller class sizes result in higher academic achievement and increased student knowledge (e.g., Tight, 2020). However, Biggs (2011) posits that constructive alignment strategies could turn the negative tide. In this regard, the application of constructive alignment is particularly important in China. Unfortunately, not many teachers and students appear to be conscious of this.

Moreover, some Chinese teachers point out that almost all Chinese classrooms are arranged in a classic teacher-centered layout. This can also impede the adoption of the student-centered approach. The students' responses to the open-ended question, "I wish the teacher would go down the podium and interact with the students more," confirmed this view.

For another, from the teachers' discourse and the sub-themes summarized, the researcher noted that, unlike the Italian examples, the Chinese teachers used the term teaching or learning objectives rather than learning outcomes. Although they referred to the same thing in the teachers' minds, in reality, they were different. This discrepancy in understanding can even affect the achievement of the desired learning outcomes for students. Rigorously speaking, the definitions for the learning terms are as follows (Hartel & Foegeding, 2004):

Competence: A general statement detailing the desired knowledge and skills of students graduating from the course or program.

Objective: A very general statement about the larger goals of the course or program.

Outcome: A very specific statement that describes exactly what a student will be able to do in some measurable way. A competence may have several specific learning outcomes.

More directly, a learning outcome is *written* so it can be measured or assessed, which is the primary distinction between an objective or competence and a true learning outcome. However, as seen in the sub-theme of the first main theme of the Chinese case, the teacher articulates the learning objectives to the students in the first class, resulting from a lack of syllabus. Compared to learning outcomes, such verbal statements often have very vague descriptions.

In Italy, student-centered learning has been driven by the Bologna process, and the syllabus

has been used for many years as an effective means of promoting student learning. Although filling out a syllabus does not really mean that the teacher has a student-centered belief, for the students, it gives a more transparent overview of the course, providing a direction for student development and promoting student learning. In the next section, the researcher will combine the students' data, and continue to compare and analyze the learning outcomes in depth.

6.4 A holistic understanding: Effective promoting competence development through student-centered course

6.4.1 From teachers' and students' perspectives: Interventions to promote engagement and deep learning

Students' activities are important indicators of the learning process and outcome quality (Zohrabi, et al., 2012) and have a beneficial influence on students' knowledge and skills development (e.g., Rodrigue-Paz et al., 2022). Visibly, the existing studies are consistent with our finding, which indicates that activities, as one of the most significant elements, have always been emphasized by teachers and students in a student-centered course, both conceptually and in terms of practical experience. Therefore, in this section, the researcher will incorporate student and teacher perspectives to examine what activities and how they might effectively encourage student involvement in learning and competence development.

From the students' perspectives. To achieve our goal, using a semi-structured questionnaire with open-ended questions, the researcher posed four questions to Italian and Chinese students to discover the types of activities in their courses, students' preferences and reasons for course activities, the most effective activities toward students' learning, and teacher interventions that would effectively promote their participation in the course.

First, regarding the type of activities applied, the course activities were diverse both in Italian and Chinese cases, as seen in Table 59. Each sample course employed a combination of activities to facilitate student learning. In other words, multiple activities mean that the "sit to receive knowledge" phenomenon did not continue throughout the entire course. Moreover, the activities highlighted in RED represent the activities that each case has adopted. We assume that these kinds of activities are common in the student-centered course and are helpful for student engagement.

Second, regarding the students' preference toward the course activities, the finding revealed that students prefer multiple-activity courses in both China and Italy over traditional courses, as presented in Figure 19. Moreover, seven main reasons were identified and summarized regarding their preference choices: more opportunities to participate and interact, facilitating learning (autonomous, active), turning theory into practical experience, promoting competence development, assessing the learning, concentrating students' attention or feeling more attractive, positive atmosphere (just in Chinese cases). Detailed example extracts are shown in Table 60.

Although there are many similarities between Italian and Chinese students' reasons for preferring a variety of activities in the course, there are also some differences. In Italy, students prefer course activities mainly for the opportunities to participate and interact so as to facilitate learning. On the contrary, Chinese students prefer activities mainly due to the fact that they can concentrate more attention and feel more interested. This is a very interesting point that 111 students share. It may be implicit that students have grown tired of the purely didactic lessons that they have endured from elementary school to high school, around 12 years.

Table 59. Type of activities in sample courses

Type of activities	Case A	Case B	Case C	Case D	Case E	Case F	Case G	Case H
Group discussion	17	17	21	28	23	34	44	85
Critical debate	13	10	6	13	0	0	0	0
Peer review	15	10	13	22	7	27	11	34
Case studies	13	6	7	3	38	18	31	75
Problem-based learning	11	11	3	4	33	28	37	58
Project-based learning	15	19	8	18	11	10	15	33
Role play	13	4	2	1	4	0	0	0
Interactive demonstrations (lecturing)	14	16	6	6	32	33	44	84
The use of audio, visuals, video	16	33	19	18	26	14	45	45
Student presentation	16	11	22	16	30	24	41	64
Brainstorming	15	8	4	15	6	14	15	17
Feedback	16	20	14	20	26	25	25	48
Assignments	12	27	4	17	37	31	27	69
(Computer-supported) collaborative learning	15	19	14	15	17	19	36	67
Flipped classroom	11	1	25	2	0	20	11	0
Interview	4	3	4	5	0	0	40	0
Assigning open-ended problems	3	3	1	2	19	28	12	55
Assigned readings	7	16	9	5	6	20	6	19
Sharing lectures (videos)	5	14	3	9	9	0	20	2
Laboratory	0	9	0	0	0	0	0	0
Storytelling	0	10	0	0	0	0	0	0

Note. Activities in *RED* means that each case has adopted.

Moreover, the other unique view mentioned by Chinese students is the favorable climate. As the students in case H shared, "traditional courses are just lectures by teachers and students listening. The atmosphere in the course is not good. Activities could make the atmosphere more positive." It is evident that students expected that activities could create a path to alter the ambiance of teaching and learning. The subsequent significant reasons are akin to Italian students – promoting their competence development, facilitating learning, and providing more chances to engage.

In addition, no reasons were provided by the Italian students for opting for "not preferring more course activities," but the Chinese students contributed further data to this study. There were five main reasons, as shown in Table 61, including traditional methods are more conducive to

learning and understanding, course time-limited, increased burden, getting used to the traditional teaching approach, and getting distracted by activities and unfair to assess. When analyzed in conjunction with the responses that "do not regard this course as student-centered," the researcher has found that although the course teachers indicate that they are with student-centered beliefs and expertise in teaching and learning, their courses are still primarily lecture-based. Except for the questions and the final presentation, which gave the students a sense of participation, the course remained a passive learning experience, and more interaction was implicit. Therefore, in the eyes of some students, it is indistinguishable from a traditional course.
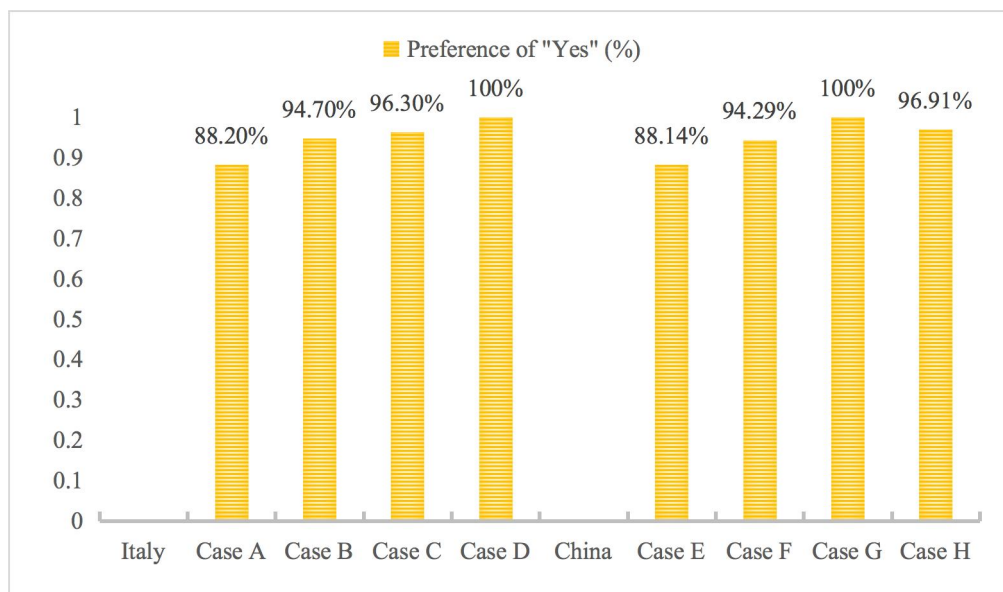
Figure 19. Compared to lecture, students' preferences toward the course activities in the Italian and Chinese context

Table 60. The summarized reasons for students' preferences toward the course activities in the Italian and Chinese context

Reasons	IT RF	CH RF	Example extracts
More opportunities to participate and interact	16	38	Because they allow students to participate actively and also put themselves from the teacher's perspective every time an activity has to be planned (Case A); More activities are conducive to improving students' sense of participation (Case E).
Facilitating learning (autonomous, active)	12	47	I prefer student-centered activities because you actively learn the more you want (Case B); In traditional lectures, students are the one who passively accepts knowledge, lacking financial support for thinking and active construction, and various activities can be used to enhance the interest in the course, as well as students' active learning (Case H).
Turn theory into practical experience	9	12	Because they allow me to put into practice and "learn by doing" which, as far as I'm concerned, is a more effective method for learning (Case B);

			More lively and interesting, especially the discussion and analysis carried out in the videos, let me feel that the knowledge learned in the course is applicable in practice (Case G).
Promote competence development	6	59	Because it allows me to learn effectively and also to cultivate transversal skills (Case D); Various forms of activities can exercise my various abilities, such as interviews to cultivate communication skills, reporting to cultivate my oral expression skills and self-confidence, group cooperation to cultivate team cooperation skills, etc., and to practice real knowledge, various forms of activities are conducive to consolidating prior knowledge and discovering new knowledge (Case G).
Assess the learning	4	3	Because the teacher gives feedback on the learning path from the beginning, and I can verify what was learned (Case C); Because it is more conducive to assessing and consolidating the knowledge learned (Case E).
Concentrating students' attention or feeling more interesting	3	111	Because it allows me to maintain a higher level of attention (Case C); Although I am already a college student, my level of concentration is still not particularly high. Traditional lectures are too boring, and courses with multiple activities are more interesting and conducive to focusing on the course, and the feeling of fatigue will be lower (Case H).
Positive atmosphere	0	19	Because the teaching approach is more lively and innovative, which can mobilize the positive atmosphere (Case G); Traditional courses are just lectures by teachers and students listening. The atmosphere in the course is not good. Activities could make the atmosphere more positive (Case H).

Note. IT = Italy; CH = China; RF = Reference points

Table 61. The summarized reasons for students' NOT prefer course activities in the Chinese cases

Reasons	Case	Example extracts
Traditional methods are more conducive to learning and understanding	E	There is a shortage of course hours, and I hope to hear more "useful knowledge" from the teacher.
	E	I think in a large class with lots of students, traditional lectures can explain knowledge better.
	E	Because these activities can't develop the depth of learning, they tend to be superficial and fresh.
	F	In the current educational experience, there are not many things that can be learned more than lectures. For example, group discussions are very inefficient. However, this form of group reporting (presentation) can indeed inspire students to engage in in-depth learning and find information in all aspects.
	H	I think that easy-to-accept knowledge does not require multiple forms.
Course time limited	H	The course time may not be enough for activities. It is recommended to

		discuss the increase of course duration before considering the innovation of course activities.	
Increased the burden	E	Various activities have increased the burden of schoolwork.	
	E	Course with multiple activities may mean more assignments or group work, a heavy workload.	
Get used to the traditional teaching approach	H	Get used to the traditional approach.	
Get distracted by activities and unfair to assess	E	The form is too rich and attracts non-learning attention.	
	E	Not well-organized the activities. Some people are always lazy in group work, trying to get something for nothing. The division of labor is unreasonable.	

Table 62. The effective activities from students' perspectives in Italian context

Activities	Reference points	Reasons	Example extract
Group discussion	19 (A = 5; B = 3; C = 5; D = 6)	1. The opportunity to engage and share ideas; 2. Peer learning, and constructing own knowledge; 3. Develop collaborative skills, communication skills, and professional skills, and recognize self-cognition level.	I believe that in my case all the group activities supported by technology are optimal to develop the ability to know how to use them and work well with others (Case A). I believe the exchange of ideas between students is fundamental (Case B). Because they allowed me to get involved, sharing ideas, and reflections with the whole group, trying always to find a common agreement (Case C). Because they allow you to put theoretical contents into practice, confront colleagues by acquiring new points of view, ideas, and knowledge, clarify doubts and find concrete solutions (Case D).
Collaborative learning	7 (A = 2; B = 4; C = 1)	1. Interact and learning from peers; 2. Intellectual growth.	Because I learn from others and in the meantime, I learn to use technology (Case A). I think that among all the activities supported during the course, the most interesting for my intellectual growth are those in which it was possible to interact with and collaborate with colleagues using technological support (Case B).
Feedback	7 (C = 4; D = 3)	1. Understand the mastery of learning outcomes; 2. Gain the guidance.	I really appreciated the feedback received from the teacher because I can more accurately know my learning situation and get appropriate guidance (Case C). Immediate feedback is very useful for understanding the progress of your learning (Case D).

Presentation	7 (A = 1; C = 4; D = 2)	1. More engagement; 2. Self-assessment of the learning progress; 3. Effective approach to mastering knowledge and skills.	With the teacher's support, presentation is a helpful approach to mastering the knowledge and skills (Case A). The presentation of the contents by us students makes the class feel more involved in the lesson (even if it is expensive in terms of time and understanding of the contents which are not always simple) (Case C). The content can be made by our students, and allow you to "test yourself" (Case D).
Project-based learning	5 (B = 2; C = 1; D = 2)	1. Promote learning and developing skills.	Because by experiencing the activity immediately and concretely, one learns more easily and develops skills more quickly (Case B). Specific project. More easily to learn (Case B).
Use of audio, images and videos	5 (A = 1; B = 1; C = 3)	1. A useful technological way to promote learning, memorizing, and reflecting on different views.	Because they better clarify the concepts expressed by the lesson and help to memorize more easily (Case B). The use of images, videos, and other multimedia tools is important, it helps and accompanies learning　(Case C). Support of videos and images and quizzes on which one reflects collectively because this allows you to reflect on different points of view than your own (Case C).
Participation-oriented activities	5 (A = 4; D = 1)	1. Develop the knowledge and skills related to social needs and personal growth; 2. Make learning more interesting; 3. More engagement and interaction; 4. Involving previous experiences, promote deep learning.	Activities that treat man as an end and not as a means, because they are welded to personal identity and social recognition (Case A). Activities where I feel involved and stimulated, which make me learn while having fun (Case A). Activities that also involve previous experiences, because they are able to arouse emotions and therefore generate a profound change (Case A). Interactive activities involve the student more (Case D).
Experiential/practical activities	3 (A = 2; B = 1)	1. Promote learning and developing practical skills.	Those in which I perform practical exercises because I believe that "doing" makes better and instant learning possible (Case B).
Problem-based learning	2 (B = 1; D = 1)	1. Facilitate learning and thinking; 2. The content related to real-world.	They are more realistic and facilitate my active thinking (Case D).

Case study	2 (C = 2)	No answers	No answers

Table 63. The effective activities from students' perspectives in Chinese context

Activities	Reference points	Reasons	Example extract
Presentation	64 (E = 18; F = 11; G = 20; H = 15)	1. Develop knowledge and skills (learning outcomes), and general skills, including collaborative skills, practical skills, express skills, analytical skills, and time management skills; 2. Stimulate independent learning, active and autonomous learning, self-confidence, and self-motivated attitude; 3. Active participation and interaction, toward deep learning; 4. Gain feedback from the teacher and peers, and know the mastery of knowledge and skills, more conducive to further improvement.	In the final presentation, experience the teaching by yourself. Because I can apply the knowledge and teacher-training skills learned in the course to practice to achieve the purpose of improvement (Case E). Because it can give each of us a real opportunity to show up in the course and improve in actual exercise, enhancing our self-confidence and teaching ability (Case E). Be able to truly recognize the course of effective teaching, recognize relevant knowledge and how to truly do effective teaching, to make the course more effective and efficient (Case F). The initiative is in our hands, we can freely control it, and the teacher's targeted evaluation and feedback are more conducive to our later self-reflection and improvement (Case G).
Group discussion	53 (E = 1; F = 10; G = 8; H = 34)	1. Better understanding the knowledge, and construct own opinions; 2. Toward deep learning; Promote students' self-learning, active learning, and divergent thinking; 3. Develop cooperative skills, practical skills; 4. More engagement and interaction, sharing without pressure with peers; 5. Learn from peers, listen to new ideas and reflect; 6. The climate of group	Because of the collision of ideas between students, a better understanding can be drawn (Case E). Because it can promote students' active learning and divergent thinking and improve cooperative skills (Case F). Able to learn more through sharing with other groups (Case G). Because group discussion is not afraid of making mistakes in class or making mistakes in public, so students can boldly participate in the classroom (Case H).

		discussion is more safe and relax.	
Case study	32 (E = 14; F = 1; G = 6; H = 11)	1. Help to understand the knowledge, and put it into practice; 2. Make the learning to be realistic, related to the experience and real-world; 3. Stimulate students' thinking, and develop practical skills, and analytical skills. 4. More engagement and more interest.	It allows us, through real cases, to combine theories, policies, and documents with learning instead of just learning boring theories (Case E). The case is attractive and gives students a bridge between theory and life (Case G). Because there are specific cases that will help me find the research direction and learn the knowledge in depth (Case H).
Problem-based learning	28 (E = 6; F = 5; G = 7; H = 10)	1. Trigger students' thinking, active learning; 2. More participation and interaction; 3. Toward deep learning and develop knowledge and skills, including problem-solving and practical skills.	Because deep questions can arouse students' thinking (Case E). Teacher's active guidance. In many cases, when we do not understand classmate' presentations or have no idea after listening to the reports of classmates, some of the teacher's guidance provides us with space and direction for thinking. Only when you have an idea, can you actively participate in the class! (Case F) Because there is interaction, communication, opportunity to speak, and opportunity to communicate (Case G) In order to solve problems, students can continuously learn and input knowledge to classify and apply knowledge, and at the same time strengthen the understanding of knowledge (Case H).
Feedback	18 (E = 2; F = 3; G = 5; H = 8)	1. More interaction and engagement, toward deep learning; 2. More conducive to knowing the mastery situation, find the shortcomings, further self-reflection, and improvement; 3. Develop knowledge and skills.	More interactive and learn from the teacher (Case E). Timely receive the teacher's opinions and make a summary. I could understand what we really learned and what we need to improve (Case F). Because it can effectively reduce my fear of answering or showing up in class (Case G). Because course participation is a two-way interaction, timely feedback

			makes me think that participation in the course is worthwhile (Case G). Groups work together to discuss topics, teachers give feedback, and students evaluate each other. In this session, everyone is actively thinking and sharing their opinions. The teacher mainly encourages us and reminds us of the areas that need improvement, which makes us feel that the course atmosphere is very harmonious (Case H).
Interview	18 (G = 18)	1. Develop knowledge and skills related to the real-world, and general skills, like cooperative skills, communication skills, practical skills, and time-management skills; 2. Stimulate active learning, active thinking, and independent learning; 3. More participation and interaction, toward deep learning and deep understanding; 4. Interesting, and self-satisfaction.	Because it tests the team's ability to cooperate and communicate, through interviews, I have a deeper understanding of the content of the course (Case G). Interviews allow us to master some realistic interview skills and in-depth exploration of social phenomena (Case G). I participated in offline interviews, text analysis and courseware production in the interview task. I have a high degree of participation and a sense of accomplishment (Case G).
Assignment	13 (E = 6; G = 1; H = 6)	1. Promote self-assessment of knowledge mastery; 2. Stimulate students' thinking, active learning, and deep learning; 3. Avoid a lazy attitude.	In this course, the teacher does not use many activities, and pure teaching is easy to be distracted, so the teacher's comments on students and after-class assignments make the most sense for classroom participation (Case E). More compulsive to learn and avoid laziness (Case G). Only when I have a goal to complete the assignment will I think deeply about each method, and there will be keen thinking interaction in the course (Case H).
Collaborative learning	12 (E = 2; G = 3; H = 7)	1. Promote active learning and peer learning; 2. More engagement and interaction toward deep learning; 3. Develop knowledge and skills,	Because mutual communication is a great promotion for learning (Case E). Be able to deeply participate in the practical research on the theoretical study of this course, and understand the

		including problem-solving skills.	knowledge that is difficult to learn in the course (Case G). Express your own opinions and learn from each other's strengths (Case H).
Use of audio, images and videos	6 (E = 2; G = 2; H = 6)	1. More interesting and involved to help students focus; 2. Better understanding of the knowledge, especially the complex and difficult ones.	Students tend to lose their attention in the process of listening to a large number of teachers' lectures. I tend to start playing with mobile phones unconsciously during this process, and the course effect is greatly reduced, and sometimes I don't even participate in the course at all (Case E). The content of the course is relatively difficult, boring, easy to be distracted, mobilizes a variety of senses, and turns difficult into easy. Learning from fun will make you feel more involved and easier to understand (Case G). I think multimedia teaching through video and audio is more helpful. Because we can see the hands-on operation with our own eyes, the learning efficiency of the course will be higher (Case H).

Third, in terms of the view of the most effective activities for facilitating learning, there were differences but overlapped between the Italian and Chinese students. Concretely, as illustrated in Table 62, students in Italy suggested ten types of activities: group discussion, collaborative learning, feedback, presentation, project-based learning, use of audio, images and videos, participation-oriented activities, experiential/practical activities, problem-based learning, and case study. Among them, most students believed that group discussion was the most productive, followed by collaborative learning, feedback, and presentation. They perceived these activities as contributing to their competence in development by having more opportunities for participation, peer learning, and guidance from teachers.

As for Chinese cases, as displayed in Table 63, nine kinds of activities were posited as effective by students, including presentation, group discussion, case study, problem-based learning, feedback, interview, assignment, collaborative learning, and use of audio, images and videos. The majority of students ranked presentation as the most valuable instructional strategy, followed by group discussion, case study, problem-based learning, and feedback. They believed these activities as contributing to participation, a positive climate, deep learning, developing their knowledge and skills, and fostering an active and independent learning attitude.

Furthermore, the researcher has extracted as much as possible examples of each case in the table. A close examination of these instances revealed that the activities that the students

considered effective were aligned with the main methods their teachers adopted for the lesson. To wit, the teaching and learning methods are aligned with the activities, even the assessment (feedback as an effective way put forward by students), and learning outcomes. From the reasons given by the students' answers, it is clear that these activities are an appropriate means to develop better students' knowledge and skills, generic skills, and positive and autonomous learning attitudes.

Reviewing the Chinese students' responses, this kind of alignment can also be found in Case G. The teacher of Case G mainly encouraged the students to learn by doing, by conducting interviews around a topic and making a presentation to share their views. Correspondingly, the students pointed out that interviews, presentations, and feedback were the most valuable for them to acquire deeper knowledge and abilities, to feel more involved and satisfied, and to get closer to the real world. Moreover, the effectiveness of the Interview was only mentioned by Case G students because it is a course-specific and knowledge-specific activity.

Thus, It is not saying that students' choices represent the most effective activities. On the contrary, it is revealed that the activities the students considered effective were targeted to the specific course, context, and knowledge, and which were the best way to promote a deeper understanding and competence development. But we can also argue that all of these techniques are common and informative in student-centered learning.

Fourth, the student-centered approach can encourage a more in-depth approach to learning, hence enhancing students' competence (e.g., Wang & Zhang, 2019). Thus, the researcher investigated the effective interventions by listening to students' and teachers' perspectives. From students' points, the results revealed that the Italian and Chinese students' perceptions of effective teacher interventions were concurrent. Their views were biased toward concrete, practical examples, as shown in Table 64, consisting of active asking and listening, encouraging and motivating students (through activities and the teacher's attitude), creating an open and favorable climate, providing feedback, leaving rooms (think and discuss), sharing teacher's experience, and the form of lecturing (only mentioned in Chinese cases). In conjunction with what we have previously researched, it was determined that these interventions by teachers are related to their comprehension of the student-centered method. Such interventions perceived by students pertain to the dialogical approach, which necessitates a constant dialogical manner in the course to elicit student interaction and foster deep learning instead of passive knowledge acquisition.

From the teachers' perspectives. Unlike students who described interventions that promote deeper student learning in relatively superficial ways, teachers explained more insightfully the meaning and purpose behind the interventions. There are five main themes identified regarding the interventions in deep learning, containing pragmatism: learning by practice, individualism and collectivism, devoted to changing the way their thinking, assessment, and constructive alignment, as concluded in Table 65. The researcher mixes the Italian and Chinese examples for analysis because the data source reveals that a lot of the sample teachers have similar perspectives.

The first main theme is a pragmatic orientation that promotes hands-on learning for students, with three sub-themes: leaving room for students, providing opportunities through activities, and work-related content. Leaving room for students is a way for the teacher to become an observer and mentor, giving students more power, time, and space to learn and do. The teacher only lends a hand when the students need it, which is a kind of motivated intervention, as the perspectives of

teachers in case A.

Table 64. Summarized the interventions on more involvement and deep learning in the course, from the student perspectives in the Italian and Chinese contexts

Interventions	IT RF	CH RF	Example extracts
Active asking and listening	26	90	He is always available for dialogue and asks several times during the lesson if there are any questions (Case B); She uses questions to stimulate reflection and discussion, by which she makes sure everyone engages and understands the topic (Case C); Always questions and asks. Stimulate students' interest in learning and mobilize everyone to think (Case F).
Encourage and motivate students (through activities and teacher's attitude)	17	52	He encourages us to listen and participate more actively through group work. Plus, I found it VERY useful how to create a Wikipedia page (Case A); He writes encouragement to us before doing the activities (Case B); First, the teacher is relaxed and smiling, which makes me feel less serious and more friendly. Secondly, I like the activities designed by the teacher. Thus, I want to participate in them actively (Case E).
Creating an open and positive climate	4	21	The teacher creates a great environment whereshe shines a lot of availability, sincerity, and simplicity (Case C); A relaxed and "safe" atmosphere can make me more willing to participate in class (Case G).
Provide feedback	5	6	She uses Apps to provide feedback that allows you to verify and understand ongoing learning (Case D); Positively giving feedback on students' responses will provide me with more motivation (Case H).
Leave rooms (think and discussion)	3	0	He leaves room for students' opinions, even profound personal ones (Case A); Give space for comparison, but you never perceive a student-teacher detachment (Case B).
Sharing teacher's experience	1	6	He pushes us to reflect, and share personal experiences (Case A); The teacher shared real experience with us (Case E).
The form of lecturing	0	6	Walk off the podium and have eye contact with students (Case E); Play video and audio when talking about the key or difficult content. The slide is beautifully made and very appealing to me (Case G).

Note. IT = Italy; CH = China; RF = Reference points

Moreover, The researcher has made countless references in previous sections to promoting students' engagement and competence development through activities based on their practical experiences. However, it is necessary to reaffirm that. Many ways lead to deep learning, but in the course, through activities to realize is the most readily and common one. This is actually a viewpoint geared toward teachers, because learning hasn't changed. It's the teaching that has to be

changed. As the teacher said:

I think that if you want to reach deep learning, you can't just teach in a frontal and traditional way. The students should be working, doing, researching, problem-solving, creating, innovating, critical thinking, trying, and simulating, ... all the participated, collaborative, and active methods can promote deep learning (Italian teacher, IT-C).

Another point about pragmatism is work-related content. Both Chinese and Italian teachers argued that deep learning involves intrinsic motivation. Students definitely have intrinsically motivated, but their motivation has to be triggered. An effective strategy is to link what is learned to the student's future career as much as possible so that the student recognizes the usefulness of the knowledge and skills and is naturally inspired to learn.

Table 65 Code-book of teachers' interventions on promoting students' deep learning in Italian and Chinese cases

Main theme	Sub-theme	Reference points	Data source
Pragmatism: learning by practice	Leaving room for students	1	Case A
	Provide opportunities through activities	2	Cases B, C, E, G
	Work-related content	2	Cases B, H
Individualism and collectivism	Mutually supportive climate	3	Cases A, B, C
	Peer assessment and collaborative learning	1	Case B
	Individual: in one's own way of learning	1	Case E
Devoted to changing the way their thinking	Passive to active attitude	3	Cases C, D, G
	Teacher as a key role	3	Cases C, D, F
Assessment	Feedback for better guidance	1	Case E
	As a scaffold to push student	1	Case F
Constructive alignment	Aligning content, activities, learning objects, assessment	2	Cases F, G

The second main theme refers to individualism and collectivism, including three sub-themes: mutually supportive climate, peer assessment and collaborative learning, and individual: in one's own way of learning. This main theme indicated two distinct positions. One is the idea that learning is a collective process in which peers form a mutually supportive environment and make progress through peer learning and reviews. As the teachers put it:

I think it varies very much in terms of students in groups. Some students group are quite pleased and homogeneous. They support each other. They have created a sort of common culture. The students in the past years in my eyes have been a more sort of homogeneous and mutually supportive group. In the group, students are more likely to learn more effectively and be motivated

(Italian teacher, IT-A).

In this course, students take responsibility for preparing a class presentation of the content assigned and learning is a collective process. I think that the strategy that I use with my students in order to motivate them intrinsically or internally, is to make the student protagonist of the teaching, and let students peer learning and assessment (Italian teacher, IT-B).

To make the students more involved in the course, among the various methods used, in this course the most involved method is the flipped classroom. Each student had some material to study and to present and discuss with his colleagues (Italian teacher, IT-C).

In contrast, one Chinese educator respected the individualism that recognizes that students are present in the classroom to learn in their own way. As the instructor explained:

Some students may not be very talkative or active in answering questions, but that doesn't mean they are not serious or unwilling to learn, don't learn well, or don't like your teaching. I don't think this can be directly equated. The student may be silent and not as active in the course, and we should acknowledge that this is the case and that this is a way of his learning style. Student-centeredness, as I understand it, also requires recognizing and accommodating the existence of such a style. And you should not assume that he is not superior in value to students who are actively answering questions, or actively interacting with the teacher (Chinese teacher, CH-E).

Based on the two opposite opinions, the researcher argued that respecting students' learning styles is to be recognized. But embracing a student-centered approach means breaking the shackles of this silent atmosphere and developing students' competence, not just knowledge. It must be acknowledged that whether it is student-centered or teacher-centered approaches, whether lecturing or adopting a variety of activities if the student is willing to learn, he will make progress. However, competence development involves generic skills and attitudes rather than merely learning outcomes. Furthermore, the development of generic skills and attitudes is, in the researcher's opinion, questionable under individualism.

In this regard, the researcher raises the question, which may be examined in depth with more empirical findings in the future, whether collectivism is more linked to student-centeredness and whether individualism tends to be more teacher-centered.

The third main theme considers devoted to changing the way their think. Two sub-themes are encompassed, passive to active attitude and the teacher as a key role. The researcher observed that teachers are committed to changing students' thinking in order to promote deeper learning, which requires an active attitude with the purpose of developing students' competence. In this sense, Italian and Chinese teachers stressed that, competence is not only skills, but also an attitude. As case G expressed:

The fundamental objective of my course is to teach students to think and build a sense of social responsibility, so that they will be able to work not just in the course but also in the future. Suppose students are motivated by developing their attitudes. In that case, they learn to transfer, to think about "what I am studying for," and to gradually transform course knowledge into concrete knowledge, to have their own plans and sense of social responsibility, and then to be further self-motivated, to stimulate their inner strength, and then to break some constraints (Chinese teacher, CH-G).

In this process of changing students' thinking way, the teacher plays a crucial role. As the

teacher in cases C and D shared:

If they understand that your goal is really to improve their life, I mean not only their knowledge. They understand that you care about them. And when they feel cared for, and they really follow and trust you. So the students come with you when you have presented the prepared for them (Italian teacher, IT-C).

When the students are passive, the teacher is a key role to motivate students. Maybe in the beginning with the external motivation, but then after that, they can understand the difference. So the importance is really to catch their attention (Italian teacher, IT-D).

The last two themes refer to assessment and constructive alignment. Chinese teachers mainly proposed these two main themes. Regarding assessment, they believed that teachers' feedback and guidance could provoke students' reflection and help them to engage better in teaching and learning. Also, the course is like a ladder, in which assessment serves as a scaffold to continuously lead students to a higher level, from the comfort zone to the development zone. Moreover, it is worth emphasizing constructive alignment. Like the teacher, in case F said:

This requires a holistic, systemic level of course design, including your course objectives, content, implementation, and assessment. Each level should point to deep learning that will likely stimulate students' intrinsic desire to learn. This is very important (Chinese teacher, CH-F).

6.4.2 Self-assessment of learning outcomes, general skills, and attitudes: Reflecting upon the effectiveness of the student-centered approach

The design and delivery of the course are directly relevant to the learning outcomes, a pedagogical component typically implicitly or explicitly contained in a course syllabus. As previously indicated by the researcher, learning outcomes are measurable statements that describe at the beginning what students should know, be capable of doing, or value as a result of completing a course or program (also called Backwards Course Design, introduced in Chapter 3).

To further examine the hypothesis that the student-centered approach promotes students' competence development, the first step is to measure the learning outcomes gap between the sample students before and after the course, as presented in Table 66. And based on the results of the learning outcomes gap, the in-depth interview with teachers was conducted to explore whether a student-centered approach is more conducive to developing students' competence. Finally, the attitude toward the student-centered approach was examined, indicating the student's satisfaction.

Analysis of learning outcomes gap. The data showed that the learning outcome gaps for the sample courses were more significant in Italy than in China, which may imply that students experienced more growth in Italian courses and the teacher effectively designed and delivered the student-centered course. In contrast, the learning outcome gaps for the sample courses were less desirable in China, especially for case E. Although the researcher could not participate in the course observations, it was identified during the empirical study that the most likely reason for this result was the lack of syllabus in the Chinese university courses. While universities require teachers to complete documents such as course plans, these documents are not publicly available, indicating that students will not have access to the specifics of the course, including learning outcomes, course content, activities, teaching methods, and assessment methods, until the course begins. Even if these are introduced to students in the first lesson, there is no written record of them. Informal dissemination of information raises the possibility of misunderstanding and vague

description (Eberly et al., 2001).

Table 66. The average of self-assessment learning outcome gap before and after the course

Cases	Number of LO	Before the course	After the course	The gap of LO
Italy				
Case A	7	1.86	3.74	1.88
Case B	6	2.18	3.31	1.13
Case C	8	1.44	3.49	2.05
Case D	8	1.86	3.58	1.72
China				
Case E	10	2.22	2.75	0.53
Case F	16	2.00	3.08	1.08
Case G	13	1.74	2.69	0.95
Case H	8 (27 items)	1.36	2.85	1.46

Note. LO = Learning outcomes, ranging from 1–4.

In addition, the teacher's competence in teaching and learning has an essential impact on the design and delivery of student-centered, competency-based courses and, thus, on the progress of students learning outcomes. In the Italian case, students made the most progress in learning outcomes in the case of C, while the best learning outcomes gap in the Chinese sample was in case H, which is a practical course. It is more likely to form a wider gap in learning outcomes since all the learning outcomes designed in this course are regarding professional knowledge and skills.

The researcher must mention the background information of the teacher in case C. As a teacher of education, she has been engaged in research on teaching and learning for many years, as well as the teacher in case F, an expert in teaching and learning. The researcher observed from the data from described interviews and students' open-question responses that these two teachers (cases C and F), in addition to possessing student-centered and competence-based concepts, are proficient in effectively applying constructive alignment in practice. Moreover, the qualitative data demonstrated that case G's teacher, who is particularly remarkable in designing and applying constructive formative assessment, is well-organized a student-centered course. However, case G's learning outcomes are ambiguous and require a second verification by the researcher. The teacher of case G is committed to teaching, but might need to pay more attention to writing and the expression of learning outcomes. Just like the early implementation of the student-centered approach in Europe or the promotion of constructive alignment by Biggs (2011), the use of learning outcomes is not yet widespread in China. They are used to express teaching goals instead.

Moreover, of the four cases in China, case F's teacher was the only one who completed the syllabus. The multiple roles that syllabus serve are evident in the literature on the student-centered approach. For additional sample teachers in China, the researcher was only able to obtain intended learning outcomes from their informal texts. This may be influencing the learning outcomes despite the effective implementation of the student-centered strategy.

Last but not least, the learning outcomes designed in Chinese sample teachers are needed to improve. On the one hand, it is worthwhile for teachers to further their understanding and study how to define the intended learning outcomes such that they can truly be used to measure students'

progress, such as referring to Bloom's taxonomy. On the other hand, as we noted, the learning outcomes gap in case G is unsatisfactory. We interviewed case G's instructor to investigate the reasons. There are two three primary causes. The first is that the design of learning objectives is very general, leading to challenges to measure. Second, since this is a first-year university course with a theoretical orientation, it is still mainly lectured by the teacher. The post-testing of learning outcomes was conducted at the end of the semester. In this regard, the case G teacher opined that the students were familiar with what they had recently learned and might have forgotten what they had learned before. Thus, these two reasons would have an impact on the results of the learning outcome gap. It is advised that when measuring learning outcomes, researchers take repeated assessments to increase their reliability. Third, in large-scale classes, it is challenging to achieve constructive alignment of learning outcomes, teaching and learning activities, and assessment due to limited time, students' diversity, and others.

Analysis of the results of in-depth interviews with teachers. In this interview, the researcher focused mainly on two questions. First, based on the results of the learning outcomes gap, the researcher examined whether the student-centered approach is conducive to students' competence development from the teacher's perspective. Second, in chapter 5, the qualitative findings revealed that the factors of the student-centered approach are more effective for developing general skills and attitudes than learning outcomes, from the correlation coefficients and the average of self-assessment.

In the Italian context, all of the sample teachers agreed with the first question. They believe that the teaching methods contributed to the results of the learning outcomes, implying that students' competence has been developed. However, they placed a great emphasis on the student-centered approach is not the opposite of the traditional one, especially the teacher in case A.

As for the second questions, likewise, the teachers concurred with the second viewpoint, explaining mainly from two aspects. On the one hand, the student-centered approach is more based on the type of humanistic approach, meaning that they were concerned with the students acquiring very relevant skills for their life, not just as human beings or relational skills, in general. Much evidence proved that students working together would develop general practical skills, but professional knowledge and skills only can be tested afterward.

On the other hand, the student-centered approach requires students to be more involved in the course. Thus, as the teacher in case B said, "*they must develop good communication, collaborative, and other soft skills.*" Moreover, the teacher created various opportunities for students put the knowledge into practice, which is helpful in verifying students' development.

In the Chinese context, most of the sample teachers agreed with the first perspectives, except for the case E's teacher, who analyzed the reason for the weak learning outcomes gap. Regarding the second question, the teachers argued that the student-centered approach is more effective for developing general skills and attitudes – that's exactly right. Three reasons were mainly identified from the teachers' words.

First, considering that they are students of education disciplines, the teachers emphasized the transformation of the student's educational concepts during the training process. Because they are training future educators, the teachers expected greater guidance to students in the area of educational philosophy and value perception.

Second, in the face of social uncertainty, it is necessary to regard each course as a "testing ground" in which the development of their own competence to confront uncertainties is the most important. In this regard, more than just the exercise of generic skills, this is a shift in student thinking. If a course achieves this result, it is a success. Thus, developing students' attitudes and generic skills is what teachers should focus on. However, expertise is also required, and the key is for students to construct their own knowledge rather than memorize it. It implies that it is significant for students to develop the ability to navigate concepts or to do academic and inquiry work through them.

Third, the development of students' generic skills and attitudes is integrated into the teaching objectives, prepared for the future society and life. Despite the fact that some professors continue to consider learning outcomes as something to be studied and mastered – notably for courses with professional regulatory examinations following – the majority view their content as offering students with future-useful skills and attitudes (Euler & Kühner, 2017). As the teacher of case G stated:

In the design of teaching objectives, the strategic goal is the mastery of some professional knowledge, theories, and concepts, and then constructing relevant professional cognition. Moreover, I highlighted that students should master a general way of thinking, which is their ability and insight to solve problems independently, preparing for the future to society. Therefore, when designing the course, developing students' independent thinking skills is also one of the goals of my course.
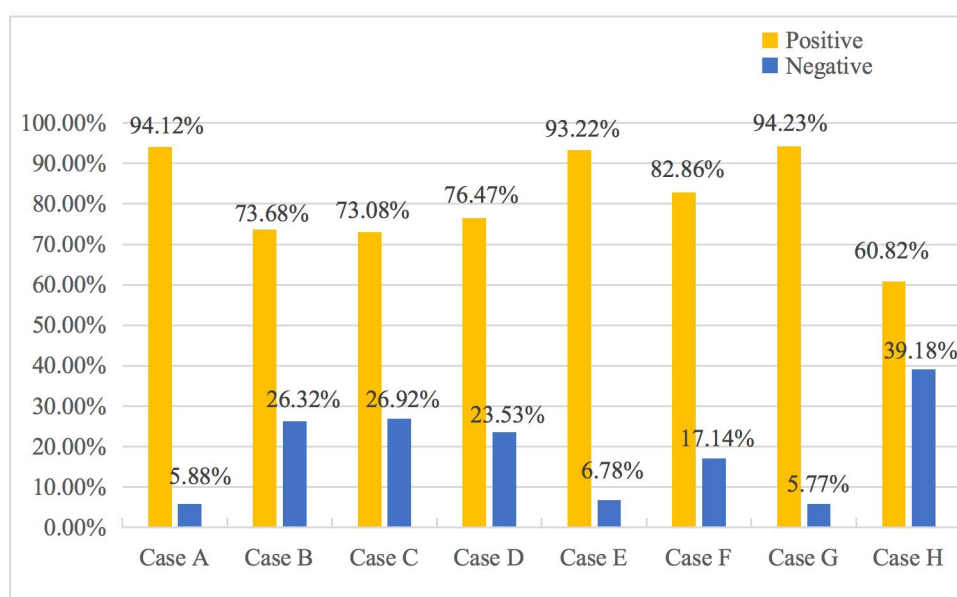
Figure 20. Students feelings after the course
Note. Positive feelings include: Happy, Hopeful, Excited, Relaxed, surprised, Anticipation
Negative feelings include: Indifferent, Prudent, Worried, Tired, Anticipation, Frustrated

Finally, the researcher investigated the students' attitude toward the student-centered approach. The data shows that most Italian and Chinese students are positive after the student-centered course. The individual Italian sample students expressed a bit of fatigue due to the amount of effort they put into the course. But as the case F's teacher stated:

Chinese undergraduate education is basically lecture-based, which causes many students to think that "teachers should not give me so many activities; I don't want to take charge; don't make me so tired." However, in my belief, students can't learn anything without being "tired."

In the case of H, there will be relatively more students who express negative emotions compared to other courses. This is because this is a more challenging practical course, and students are worried about their grades on the final exam. This phenomenon reflects the solidification of talent development programs in China. As the teacher in case H complained:

Choosing a final exam as a summative evaluation for this course is unreasonable. However, this is stipulated in the university's talent development program, and teachers do not have the authority to change it, resulting in unsatisfactory student learning outcomes. The autonomy of instruction should be appropriately delegated to the teachers.

This implies that improving the quality of teaching and learning and promoting the development of students' competences requires the institution's support, which we will discuss in the next section.

6.4.3 From teachers' perceptions: Regarding institution's support and challenge

The student-centered approach should be viewed as a holistic term involving various stakeholders. Initially, the researcher intended to examine whether and how to support student-centered learning in higher education institutions. However, it could be revealed after interviewing and coding with teachers that student-centered approaches confront challenges more than support. The phenomenon is similar in Italy and China.

Four main themes were identified and categorized regarding institution's support and challenge toward student-centered approach, including culturally, theoretically and politically already to acknowledge, but limited in practice, challenge university, university department or program to promote, and evaluation system. For a more detailed description, Table 67 shows the sub-themes, number of data sources, and reference points.

The first main theme refers to a phrase "culturally, theoretically and politically already to acknowledge, but limited in practice", which is described the status of the student-centered approach. Three sub-themes are contained, including teacher's preference, in course design and delivery: at the cultural level, and inadequate professional culture for individuals is dangerous.

Although higher education institutions develop programs and activities to help teachers develop their competence in teaching and learning, participation is the teacher's personal and voluntary act. Therefore, very few teachers are willing to engage in training. As the teacher in case B stated:

The Teaching4learning program is effective for faculty at my university. Recently, the department asked me to hold a seminar for the other colleagues of my department about the practice that I used with my students, in particular, the practice in the course (practical experience sharing). There were six participants, very few. But in my department, there are about 140 teachers. These six teachers were very satisfied with my sharing, but they are only six teachers. So the problem is not about the programs, but the attitude that we have in order to improve our teaching (Italian teacher, IT-B).

Moreover, driven by the Bologna Process, university acknowledge the importance of being student-centered, at least in culturally, theoretically and politically. However, in practice,

especially in course design and delivery, few teachers committed to it. This phenomenon exists both in Italy and China. As the teachers described:

So in some the university, for me, is very little student center, very, very little. And sometimes, it has an extra measure to make it more student-centered. But the way we teach is very little student-center. And our preparation is not student-center. So in my eyes, it's more a metric of working at the cultural level (Italian teacher, IT-A).

The teacher in China presented the same opinions:

It's hard to have most teachers do student-centered course design and delivery. Because the individual teacher himself will have a solidification of what my original style is, or what my previous teacher's style was, and what my original culture was, then he is likely to maintain his original culture, or choose a preferred culture to work with students. Cultural formation and transformation is a very long process. Therefore, a student-centered approach to holistic, systemic change is difficult to achieve. There is sometimes a very strong "inertia" in university change (Chinese teacher, CH-F).

In addition, if a teacher's professional culture is not ready at all and even can produce mistakes, it is dangerous for him or her put the student-centered approach into practice. As the teacher in case A said:

The university needs a more humble approach to a student-centered approach, to link it with other relevant methodological features, and to have time and space for reflecting upon what we do and sharing with partners. So for me, the most important issue here is how to provoke apparent observation. Teachers and reflective teams can share these issues and produce a common culture (Italian teacher, IT-A).

The second main theme is mainly proposed by the teacher in case A. He suggested that it is necessary to have more examples of student-centered success, or proven indicators for universities to see, to challenge universities to promote more student-centeredness in practice. As the teacher stated:

I think your work can be very instrumental in this. Because the more we produce the scriptures and indicators of the actions and the benefits of a student-centered approach, the more we can challenge the university to integrate them and monitor the results. This is really the level. So, in my opinion, the university is culturally or maybe theoretically and politically already to acknowledge the importance of being student-center. As for the practice, it still needs to promote (Italian teacher, IT-A).

The third main theme considers university department or program to promote, encompassing two sub-themes, which is the programs in Italian cases and Chinese cases. In Italian cases, the program called Teacher4learning, for innovative teaching and learning in the university. A lot of events are organized to improve the teachers' skills and competence, such as workshops and seminars (3–4 for each semester). As described by the teacher in case C, "*I always receive a lot of emails about the events they organized.*" Moreover, the teaching4learning program produces open badge for peer observation, helping teachers improve their own teaching culture and practice.

The program promote student-centered approach in Chinese cases are called "Qinglan" program and "Golden" course, which organized by the department of teacher development center of the university. As stated by the teacher in case H:

There is a program called the "Qinglan" (Youth and Cradle) project, which helps young

teachers (novice teachers) to get up to speed in course design, lecture, and course implementation. I think the university provides a platform and opportunity for teachers to exchange and explore their experiences. Then this exploration process includes the student-centered philosophy and specific practical operations, which are helpful and good *(Chinese teacher, CH-H)*.

The last main theme refers to the evaluation system, including two sub-themes: award for research but not teaching and learning and unreasonable teaching and learning evaluation system. On the one hand, teaching is far less valued than research at universities. Universities reward teachers who publish scientific research, not teachers who are committed to teaching. Although there are some teaching competitions, research still plays a crucial role in a teacher's career. Thus, as the teacher in case H argued:

There is a phenomenon of putting students at the center, thinking more about them, putting more effort into teaching, improving the effectiveness of teaching, and getting more input from students, which is a bit of a "conscience work," as the teachers say. Since the student-centered approach is not mandatory, some people choose not to adopt it, or feel ashamed of their students before they are willing to adopt it, and it becomes such a situation *(Chinese teacher, CH-H)*.

Table 67. Code-book of institution's support and challenge from teachers' perceptions in Italian and Chinese contexts

Main theme	Sub-theme	Reference points	Data source
Culturally, theoretically and politically already to acknowledge, but limited in practice	Teacher's preference	6	Cases B, C, D, F, G, H
	In course design and delivery: at the cultural level	3	Cases A, F, G
	Inadequate professional culture for individuals is dangerous	1	Cases A
Challenge university	Produce references and indicators of the actions and advantages of a student-centered approach	1	Case A
University department or program to promote	Italy cases: Teaching4learning	4	Cases A, B, C, D
	Chinese cases: "Qinglan" program, "Golden" course	2	Cases E, H
Evaluation system	Award for research but not teaching and learning	3	Cases B, E, H
	Unreasonable teaching and learning evaluation system	1	Cases E, H

On the other hand, the unreasonable evaluation system hinder the advancement of a student-centered approach. This unreasonable evaluation system refers to the teaching and learning evaluation, which is only mentioned in the Chinese cases. The evaluation system is a baton and plays an important guiding role. If the evaluation index system of teaching is not scientific, the quality of teaching will be harmed consequently. As the teacher in case E

complained:

The current teaching evaluation index of our institution is something that teachers have been dissatisfied with. In order to improve the teacher's evaluation (rating), the division threshold is set at 30%. This means that teachers ranked in the bottom 30% are subject to mandatory training or accept other arrangements. However, this is not reasonable. Because all teachers are rated above 90, the difference in scores between teachers is a fraction of a point. How can such a standard judge how good or bad a teacher is at teaching? It will only increase insecurity, thereby affecting the quality of teaching and learning (Chinese teacher, CH-E).

To conclude, whether the university adopted or supported the student-centered approach or not is not the most important issue. Instead, the point is how to make it by the teachers themselves. The real change comes from the teacher's beliefs and attitude, from perceiving one's teaching as better than the past, from the student's satisfaction, and from the students really developing their competences due to one's instruction.

Conclusion

Many existing studies have advocated for further research to explore how to develop student' competence in various contexts and approaches (e.g., Ali, 2019; Barth et al., 2007; Cajiao & Burke, 2016; Lei, M & Medwell, 2021). In response to this appeal, this cross-culture study examined the association and the role of the student-centered approach in students' competence development in the Italian and Chinese university education discipline contexts. Using both Italian and Chinese data sets for analysis, the results revealed that the student-centered approach positively relates to students' competence development. Under this overarching question, four specific questions guided the research.

The first question concerned the concepts and policies of the student-centered approach and students' competence. Starting with the philosophy, regarding the philosophy and origin of the student-centered approach, the distinctions between Eastern and Western countries regarding teaching and learning modalities are rooted in their respective historical and cultural origins. It implies that the disparities between authoritarian and democratic societies in the East and the West have indirectly influenced the teaching and learning paradigm.

From the students' eyes regarding the term student-centered approach, both Italian and Chinese students perceive and understand this concept more through practical experiences. The empirical finding indicated that students' understanding of the student-centered approach converged, containing similar factors, such as activities, teacher's belief, student autonomy, environment, assessment, content, and student development. However, there is a subtle distinction between their perspectives. In the Italian context, the teacher's belief is the most significant starting point of the student-centered approach. In comparison, in Chinese students' perspectives, activities are the utmost in the student-centered approach, which provides them more opportunities to participate in the course, as the course scale in China is larger.

Therefore, in the Italian students' eyes, the student-centered approach is an effective strategy that starts with the teacher's beliefs, in an intertwined combination and alignment of activities, environment, course content, and assessment to promote students' autonomy and competence development. While from Chinese students' perspective, the student-centered approach is a means to promote a power balance between the teacher and student, as well as a set of pedagogical strategies and practical techniques that, mainly through creating engaging activities and a combination of various factors, promote students' autonomy, independent thought, and competence development.

Moreover, from the teachers' perspectives regarding the term student-centered approach, the finding showed that although teachers' understanding of the student-centered approach is significantly different, all involve three aspects regarding course design, way of implementation, and value. Remarkably, the teachers agreed that the most considerable value of the student-centered approach is fostering student development, and providing the knowledge, skills, and attitude applicable to their present and future life. Their specific perspectives are summarized in section 6.2.3.

In addition, the study analyzed the historical evolution, various definitions, international consensus, and trend on the term students' competence development. In contrast to the vague definition of the student-centered approach, the researcher defined competence as the combination of learning outcomes, general skills, and attitudes. From theory to practice, this study elaborated

and discussed how to apply the competence theory to the student-centered course.

Policy-wise, based on the comprehensive analysis of the policies and documents from Europe and China, the study indicated that governments and organizations in both Europe and China had launched many policies on the student-centered approach and the development of students' competence. It suggested the value placed on teaching and learning as well as on students' competence in both places. However, there is considerable evidence showing that they share the same dilemma: the decoupling of policy from practice. Thus, translating policies into reality remains challenging, particularly at the institutional level.

There are also some variations between Europe and China in their respective policies and practices, particularly in student participation in policy-making and the development of the competence framework. Europe is a step ahead in these two aspects. Based on the unique context of Italy and China, the study also found an additional fundamental difference. When it comes to competence-based student development, China tends to take the state demand as the starting point, whereas Europe prefers to view the student per se as the starting point.

The second question was regarding identifying the factors of the student-centered approach that affected students' competence development and constructing the survey instrument. Based on the systematic review, evidence associating the student-centered approach with students' competence development has continued to emerge in the past two decades. The study demonstrated that the factors of the student-centered approach, including environment, teacher's and students' beliefs, teacher emotion, content and materials, activities, assessment, teacher competence, and institutional support, are closely related to students' competence development. According to this finding, a semi-structured questionnaire measuring the student-centered approach on students' competence development was constructed with good reliability and validity.

The third expectation was to explore the structurally intrinsic relationship between the student-centered approach and students' competence development. Based on the results of structural equation models, this study reaffirmed that the student-centered approach was positively associated with students' competence development, which backed up the hypothesis and is consistent with the previous research results (e.g., Serin, 2018; Soubra et al., 2022). Given that the student-centered approach covered a number of aspects, it implies that its success is the consequence of a combination of factors (Jaiswal & Al-Hattami, 2020; Lancaster & Topper, 2023).

Despite the similarities in the results between the two national cases, several differences existed. For example, the mean of nearly all variables and the correlation coefficient in China were marginally lower than that of Italy. These phenomena implied that the cases in Italy seemed to be more successful in embracing the student-centered approach. In comparison, the process of shifting to the student-centered approach in China's higher education has been slower. The researcher further discussed them from the cultural and higher education system perspectives.

Last, the fourth question was expected to investigate the influential factors motivating students and the teacher's efforts in the student-centered course. Institutions' measures to support student-centered courses are also of interest to this study. Based on teachers' and students' discourse, the study summarized nine practical experiences concerning course design, delivery, and assessment, which can effectively promote competence development in section 6.3.3. And the

researcher compared the implementation of the student-centered approach in two different cultures and contexts and discussed some various phenomena and their underlying causes, including varying class sizes, classroom layouts, and use of syllabi.

Subsequently, the study profoundly explored the impact of activities, learning outcomes, and ways of assessments on students' competence development. In conjunction with the findings – many students perceived the merit and importance of student-centered environments. The researcher strongly recommended that it is necessary to design an environment consistent with the employed educational strategy, such that learning outcomes, activities, and assessments align with the environment, realizing effective teaching and learning.

In terms of the institution's support, whether the university adopted or supported the student-centered approach or not is not the most important issue, although both sample universities have supportive teaching and learning projects. Instead, the point is how to make it by the teachers themselves. The genuine change results from the teacher's belief and attitude, the perception that one's teaching is superior to the past, the student's satisfaction, and the students' actual development of competence as a result of one's education.

All in all, the student-centered approach has a positive impact on students' competence development. However, based on the different contexts of Italy and China, the findings indicated that commonalities and differences have coexisted. There is no unified formula for adopting the student-centered approach to develop students' competence. Faced with diverse views and applications in different cultural contexts, it is all the more crucial to learn from one another. As Chinese philosophy put it, '*ge mei qi mei, mei mei yu gong*' (respect one's own culture and appreciate the culture of others for harmony and prosperity).

Indeed, regarding this topic, the comparative study of Italy and China is uncommon, and the study tries to fill the research gap. It is of particular significance because previous studies on this issue typically focused on a single component or compared Italy to other western countries. Therefore, the study can also be viewed as a good opportunity to open a dialogue between Italy and China.

No study is ever perfect. Notwithstanding this study's theoretical and practical contributions, it also contains underlying limitations that suggest new directions for future research in similar or distinct contexts. First, due to the pandemic, the researcher was unable to perform fieldwork via observation in the classroom. If not, there might have been more significant discoveries and insights. In addition, the researcher's inadequate Italian competence makes it difficult to study pertinent Italian policy in depth. The policy analysis can be refined by collaboration with other scholars in the future. It would have been fascinating to compare these results to those in China. Second, the findings are based on data collected from student's individual self-assessment questionnaires, without the teacher's judgments or comments from others, which are relatively subjective. Future research should broaden the variety of data-gathering sources to bolster the convincing of the findings. Another limitation is that this study adopted a cross-sectional approach to collect data on all variables in the same period (a case for a course, a semester). For a better understanding of the relationship between the student-centered approach and students' competence development, future research could employ the longitudinal approach, which investigates the same group of stakeholders over an extended period. Finally, the study was conducted in the discipline of Education and was based on samples from Italy and China. Its

conclusions may not generalizable to other disciplines or countries. Further research could take an expanded sample source to strengthen the representativeness or comparative perspective, as well as undertake in-depth studies to determine whether this model might vary depending on the type of discipline or different cultural contexts.

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Appendix

Appendix A

Table A. Codification of articles included in systematic review

Code	Author(s) and Year	Journal Name	Title
1W	Levesque-Bristol et al. (2020)	Current Psychology	An evaluation of the integrative model for learning and motivation in the college classroom
2W	Terskikh (2015)	Procedia-Social and Behavioral Sciences	The Role of Project Activities in the Study of Course "Social Advertising"
3W	Mielkov et al. (2021)	Revista Tempos E Espaços Em Educação	Higher education strategies for the 21st century: Philosophical foundations and the humanist approach
4W	de la Hoz i Casas et al. (2009)	Journal of Electrical Engineering Education	'Learning by doing' methodology applied to the practical teaching of electrical machines
5W	Montalvo García et al. (2022)	Educar	Development of emotional competences in higher education: The effects of a self-leadership program from a dexplis design
6W	Švejdarová (2020)	INTED Proceedings	"Diversity experienced" – Developing Intercultural competence through agile team project-based learning
7W	Acton (2019)	Education Sciences	Mapping the evaluation of problem-oriented pedagogies in higher education: A systematic literature review
8W	Simões et al. (2019)	Edulearn 19 Proceedings	Developing business English communication skills and intercultural competence: A student-centered approach
9W	Núñez-Canal et al. (2022)	Technological Forecasting and Social Change	New challenges in higher education: A study of the digital competence of educators in Covid times
10W	Donovan et al. (2018)	CBE—Life Sciences Education	Student learning outcomes and attitudes using three methods of group formation in a nonmajors biology class
11W	García-García et al. (2022)	Revista de Investigación Educativa	Content validation of the 'learning to learn' competence in undergraduate studies
12W	Rodrigue-Paz et al. (2022)	2022 IEEE Global Engineering Education Conference (EDUCON)	A challenge based model for the development of digital transformation and disciplinary competences in structural engineering courses
13W	Zhang et al. (2019)	Journal of Professional Issues in Engineering Education and Practice	Integrated experiential learning-based framework to facilitate project planning in civil engineering and construction management

			courses
14W	Ballester-Sarria et al. (2012)	2012 Frontiers in Education Conference Proceedings	Analizing students performance in an EHEA BEng Industrial Design Engineering degree
15W	Gilis et al. (2008)	Research in Higher Education	Establishing a competence profile for the role of student-centred teachers in higher education in Belgium
16W	Divjak et al. (2022)	British Journal of Educational Technology	Assessment validity and learning analytics as prerequisites for ensuring student-centred learning design
17W	Guerrero-Roldán & Noguera (2018)	The Internet and Higher Education	A model for aligning assessment with competences and learning activities in online courses
18W	Smirnova et al. (2019)	SHS Web of Conferences	Implementation of a student-centered approach in blended learning in a higher educational institution
19W	Sievers et al. (2017)	ICERI2017 Proceedings	Creating insight among students on working life competences through problems based learning
20W	Escandell & Chu (2021)	Teaching of Psychology	Implementing relatedness-supportive teaching strategies to promote learning in the college classroom
21W	Alisauskiene et al. (2015)	Edulearn15 Proceedings	Inquiry-based learning in social field studies in higher education: Lithuanian experience
22W	Liu et al. (2022)	Journal of Dental Education	Development and assessment of an online virtual orthodontic curriculum
23W	Du et al. (2021)	Risk Management and Healthcare Policy	Is clinical scenario simulation teaching effective in cultivating the competency of nursing students to recognize and assess the risk of pressure ulcers?
24W	Henri et al. (2017)	Journal of Engineering Education	A review of competency-based learning: Tools, assessments, and recommendations
25W	Van Ginneke & Vanthournou (2005)	Journal of Veterinary Medical Education	Rethinking the learning and evaluation environment of a veterinary course in gross anatomy: the implementation of an assessment and development center and an e-learning platform
26W	Marton et al. (2019)	Edulearn19 Proceedings	Project based learning applied to bachelors degree in energy engineering
27W	Braßler (2016)	Teaching Education for Sustainable Development at	Interdisciplinary problem-based learning—a student-centered pedagogy to teach social sustainable development in higher education

		University Level	
28W	Bozic et al. (2018)	The International Journal of Engineering Education	New instructional approach for fostering generic and professional competences: Case study of the project and problem based learning engineering practice course
29W	Calvão et al. (2019)	Edulearn19 Proceedings	Pedagogical practices in higher education: improving students' competences through cross-curricular problem-solving activities
30W	Jeong et al. (2019)	Journal of Baltic Science Education	Examination of students' engagement with R-SPQ-2F of learning approach in flipped sustainable science course
31W	Khoury (2022)	Heliyon	Perceptions of student-centered learning in online translator training: Findings from Jordan
32W	Zarifsanaiey et al. (2016)	BMC Medical Education	A comparison of educational strategies for the acquisition of nursing student's performance and critical thinking: Simulation-based training vs. integrated training (simulation and critical thinking strategies)
33W	Cho et al. (2021)	International Journal of STEM Education	Enhanced student perceptions of learning and performance using concept-point-recovery teaching sessions: A mixed-method approach
34W	Rukmini et al. (2018)	The Indonesian Journal of Medical Education	Student-centered learning in relation to class performances and soft skills: A meta-analysis and systematic review
35W	Krystalli & Arvanitis (2018)	Edulearn 18. 10th International Conference on Education and New Learning Technology	Serious games in higher education: Students' perceptions-the case of School of French of Aristotle University of Thessaloniki
36W	Fu et al. (2022)	Surgical and Radiologic Anatomy	Practice and exploration of the "student-centered" multielement fusion teaching mode in human anatomy
37W	Cabedo et al. (2018)	Sustainability	University social responsibility towards engineering undergraduates: The effect of methodology on a service-learning experience
38W	Sukackė et al. (2022)	Sustainability	Towards active evidence-based learning in engineering education: A systematic literature review of PBL, PjBL, and CBL
39W	Rico (2019)	The Interpreter and Translator Trainer	The ePortfolio: Constructing learning in translation technology
40W	Pedrosa de Jesus & Moreira (2009)	Assessment & Evaluation in Higher Education	The role of students' questions in aligning teaching, learning and assessment: A case study from undergraduate sciences

41W	Walters et al. (2017)	The Qualitative Report	Teaching, learning, and assessment: Insights into students' motivation to learn
42W	Lozano et al. (2017)	Sustainability	Connecting competences and pedagogical approaches for sustainable development in higher education: A literature review and framework proposal
43W	Vasilchenko et al. (2018)	2018 IEEE Frontiers in Education Conference	The self-flipped classroom concept: Underlying ideas and experiences
44W	Barba-Guaman et al. (2018)	2018 13th Iberian Conference on Information Systems and Technologies	Using wolfram software to improve reading comprehension in mathematics for software engineering students
45W	Tam et al. (2009)	Teaching in Higher Education	What undergraduate students in China say about their professors' teaching
46W	de Carvalho (2019)	2019 IEEE Frontiers in Education Conference	Virtual experiential learning in engineering education
47W	Jennings & Greenberg (2009)	Review of Educational Research	The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes
48W	Trigwell & Prosser (1991)	Higher Education	Improving the quality of student learning: The influence of learning context and student approaches to learning on learning outcomes
49W	Baartman & De Bruijn (2011)	Educational Research Review	Integrating knowledge, skills and attitudes: Conceptualising learning processes towards vocational competence
50W	Wright (2011)	International Journal of Teaching and Learning in Higher Education	Student-centered learning in higher education
1C	Wang et al. (2022)	Chinese Medicine Modern Distance Education of China	Research on the "student-centered" and "ability and quality" combined teaching mode of classics of traditional Chinese Medicine — Taking the course comprehensive differentiation and application of prescriptions and syndromes of febrile disease in the golden chamber of typhoid fever as an example
2C	Zhang & Zhou (2021)	Modern Education Management	Research on multiple evaluation systems of student-centered engineering practice ability
3C	Liu (2020)	Tourism Management	Construction and exploration of a student-centered and competence-oriented first-class course on tour guide business
4C	Gong (2020)	Automobile Education	Research on the cultivation of student-centered innovation ability of college students
5C	Li et al.	China Health Industry	Study on improving the ability of surgical

			(2019)		interns to diagnose and treat with the student-centered hybrid teaching method
6C	Song et al. (2019)	Green Packing Research and Education	Teaching reform and practice of basic ability training for engineer based on student-centered idea
7C	Wang (2019)	Heilongjiang Education (Research and Evaluation of Higher Education)	"Student-centered" comprehensive competence development of the exploration and practice of professional experimental teaching mode
8C	Liu & Zhu (2019)	Medical Education Research and Practice	Construction of a student-centered undergraduate innovation ability training system
9C	Hou et al. (2018)	Education Teaching Forum	Student-centered and competence-oriented exploration of teaching innovation of industrial water treatment course
10C	Song et al. (2018)	Knowledge Base	Exploring the cultivation of student-centered innovation and entrepreneurship skills among college students
11C	Chen & Ren (2018)	Course Education Research	Research on the teaching methods of professional degree students to improve position-oriented competence and student-centered methods
12C	Luo (2017)	Modern Education Management	Discussion on the teaching mode of "student-centered" comprehensive practical training course of tour guide serviceability
13C	Yuan et al. (2016)	Computer Education	A student-centered cloud platform for cultivating practical and innovative computer skills
14C	Guo et al. 2016	Journal of Zhejiang Chinese Medical University	Establishment of pharmaceutical technology interesting class based on "students centered learning" and comprehensive ability training of students
15C	Hu (2014)	Sichuan Journal of Physiological Sciences	Cultivation of students' ability-centered and improving teaching quality
16C	Zhao et al. (2014)	Chemical Industry Times	Development of student-centered independent learning skills in basic chemistry teaching
17C	Zhang et al. (2013)	Journal of Mathematical Medicine	Effect of student-oriented teaching mode in pathology for the Cultivation of the nursing students' autonomous learning ability
18C	Deng & Xin (2007)	Journal of Yibin University	Analysis of teacher lecturer's emotional ability in student-centered classroom teaching
19C	Yang & Tang (2021)	Journal of Higher Education	Exploring the construction and practice of student-centered teaching model in applied

			colleges and universities
20C	Zhao et al. (2018)	Jiangxi Chemical Industry	A study on student-centered teaching model of general environmental engineering
21C	Liu (2016)	Master dissertation, National University of Defense Technology	Research on the reform of student-centered undergraduate teaching model
22C	Ge (2016)	Modern computer	Thinking and practice of student-centered education mode
23C	Shao et al. (2016)	The Science Education Article Collects	Research on the construction of open practical teaching system based on students as the center
24C	Yang (2013)	Master dissertation, Jiangxi Normal University	Student-centered teaching quality in UK universities
25C	Gao (2022)	Marketing Circles	Research and practice of student-centered teaching model — Take the accounting major of Zhengzhou Business School as an example
26C	Hu (2021)	Journal of Higher Education	A case study of paradigm transformation of student-centeredness in the application-oriented university — Based on Xi'an Eurasia University
27C	Zhang et al. (2021)	Teaching and Education	A student-centered online open university mathematics exploration and practice of course construction
28C	Ma & Li (2019)	Journal of Hebei University of Economics and Business (Comprehensive Edition)	Re-thinking the quality of university education in the student-centered education reform
29C	Feng & Ding (2019)	Journal of Zhaoqing University	The construction and implementation of "student-centered" education and teaching system
30C	Wu et al. (2019)	Heilongjiang Education (Research and Evaluation of Higher Education)	Student-centered university teaching quality evaluation system construction
31C	Wan (2019)	Modern University Education	Student-centered university curriculum restructuring: relationships and misconceptions
32C	Lv (2014)	Modern Education Management	Study on construction of student-centered course assessment indicator system
33C	Wang (2014)	Education Teaching Forum	The reform and practice of "Introduction to Sociology" course in the context of student-centeredness
34C	Zhang et al.	Anhui Chemical Industry	Teaching design and practice of "organic

	(2022)		chemistry" centered on the students under the interaction paradigm
35C	Zhao (2021)	Journal of Wuhan Polytechnic	Research on the ways to improve the teaching ability of university teachers from the perspective of "student learning as the center"
36C	Zhao et al. (2021)	Automobile Applied Technology	The teaching reform of mechanical principle course centered on students' ability cultivation
37C	Huang & Li (2021)	University Education	The student development-centered model for cultivating students' innovation skills
38C	Li (2019)	Heilongjiang Science	Study on the teaching and training of communication ability of nursing students in gynecology and obstetrics: The application of "student centered" teaching method
39C	Zhang et al. (2013)	Economic Research Guide	Design of independent learning teaching method of computer composition principle centered on students' competence development
40C	Hont et al. (2022)	China University Teaching	The design of curriculum teaching for students' competence cultivation: A case study of software engineering
41C	He (2020)	University Education	Teaching reform of curriculum following the concept of engineering accreditation
42C	Fu & Dai (2019)	Computer Education	Reform and practice of student-centered large class teaching mode
43C	Ge et al. (2022)	Education and Teaching Forum	On the practice of cultivating innovative ability of computer students in colleges and universities in ethnic areas
44C	Zhang et al. (2019)	Office Information	Exploration on the construction of first-class courses with "student-centered, data-driven, outcome-based"
45C	Feng et al. (2017)	China University Teaching	Curriculum reform and practice based on the concept of "student-centeredness"

Appendix B

Table B1. The design process of the second questionnaire for students

Dimensions	Sub-dimensions	Indicators	Questions (Items)	Questions in Chinese	Questions in Italian
1. Student-centered approach	1.1 Environment	1.1.1 Supportive environment	During the course, the teacher created a supportive environment.	在课程中,老师营造了一个支持性的环境。	Il docente crea un ambiente di supporto.
			I could feel the teacher's support for my autonomic learning.	我可以感受到老师对我自主学习的支持。	Ho potuto sentire il supporto del docente per il mio apprendimento autonomo.
		1.1.2 Course culture (climate)	The teacher builds a course culture of positive learning.	老师营造了积极学习的课程氛围。	Il docente crea una cultura di apprendimento positivo.
			The teacher builds a course culture of collaborative learning.	老师建立了协作学习的课程氛围。	Il docente crea una cultura di apprendimento collaborativo.
		1.1.3 Open-ended environment	The teacher generates learning opportunities in an open-ended learning environment during the course.	在课程期间,老师建立了开放式的学习环境,并提供学习机会。	Il docente genera opportunità di apprendimento in un ambiente di apprendimento aperto.
		1.1.4 Experience of learning environment	The teacher created a positive climate that has an impact on the way I learn.	老师积极的课堂氛围对我的学习方式产生影响。	Il docente ha creato un clima che ha un impatto sul modo in cui imparo.
	1.2 Teacher's emotion	1.2.1 Social and emotional competence	The teacher could actively and skillfully use their emotional expressions and verbal to lecture.	老师能积极熟练地运用自己的言语和情感表达授课。	Il docente utilizza attivamente e abilmente le proprie espressioni emotive e il supporto verbale per il corso.
		1.2.2 Impact	The teacher's positive emotions could promote students'	老师的积极情感有助于支持和促进你的学习热	Il docente utilizza le emozioni positive per promuovere

			enthusiasm of learning.	情。	l'entusiasmo dell'apprendimento.
			The teacher's positive emotions will positively impact my learning attitude.	老师的积极情绪会对你的学习态度产生正面影响。	L'emozione positiva del docente avrà un buon impatto sul tuo atteggiamento di apprendimento.
	1.3 Teacher's belief	1.3.1 Teachers' goal	The teacher could effectively respond to the student's individual needs.	老师能有效地回应学生的个人需求。	Il docente risponde efficacemente alle esigenze individuali dello studente.
			I think the teacher could value the development of students' soft transversal competences, such as critical thinking, team building, etc.	我认为老师很重视学生的横向能力发展，例如批判性思维，团队协作能力等。	Percepisco che il docente apprezza lo sviluppo delle competenze trasversali degli studenti, come il pensiero critico, il teamwork, ecc.
		1.3.2 Teacher's role	The teacher works as a facilitator in the course.	我认为在本课堂上，老师的角色是促进者。	Il docente lavora come facilitatore nel corso.
		1.3.3 Diversity of students	The teacher pays attention to students' interests, needs, and abilities and respects different learning styles.	老师能重视学生的兴趣、需求与能力，并尊重不同的学习方式。	Il docente presta attenzione agli interessi e alle capacità degli studenti e rispetta i diversi stili di apprendimento.
		1.3.4 Participate-oriented	The teacher encourages students to participate constantly in the learning process.	老师不断鼓励学生参与到课堂的学习过程中。	Il docente incoraggia gli studenti a partecipare continuamente al processo di apprendimento.
	1.4 Material and content	1.4.1 Material	The topics are covered to be used in the workplace.	课堂上选定的教学主题是可以在工作场所中应用的。	Gli argomenti sono trattati in moda tale da poter essere utilizzati sul posto di lavoro.
			The materials chosen by the	我认为老师选择的教材	I materiali scelti dal docente mi

			teachers are very useful and can increase my knowledge.	非常有用，可以增加我的知识。	sono molto utili e possono aumentare le mie conoscenze.
			The teaching materials chosen by the teacher are very relevant to the topics we are talking about.	老师选择的教材，与我们本课程学习内容非常相关。	I materiali didattici scelti dal docente sono molto attinenti agli argomenti di cui stiamo parlando.
		1.4.2 Content	I am interested in the topics and content in the course.	我对课程中的主题和内容感兴趣。	Sono interessato agli argomenti e ai contenuti del corso.
			The teacher put forward the relevant and challenging content (learning outcomes).	老师安排的教学内容具有挑战性。	Il docente ha organizzato i contenuti rilevanti e stimolanti (risultati di apprendimento).
			There is a close connection between the topics in every unit.	每堂课的主题之间有着紧密的联系。	C'è una stretta connessione tra gli argomenti di ogni unità.
	1.5 Students' motivation	1.5.1 Intrinsic orientation	When I have the opportunity in this course, I will choose the course assignments I can learn from, even if they don't guarantee a good grade.	若自主选择，哪怕不能保障获得好成绩，我也会选让自己学到更多的作业类型或者汇报主题。	Quando ho l'opportunità, scelgo i compiti del corso da cui posso imparare anche se non garantiscono un buon voto.
			I am glad that the teacher attempted to present an interesting question to motivate me to take ownership of the process of developing a response.	当老师提出一个有趣且具有挑战性的问题，有机会能激发或促进我自己去建构答案，我会很开心。	Sono felice quando il docente pone una domanda interessante e stimolante e c'è l'opportunità di stimolare o facilitare la mia costruzione della risposta.
			I am very interested in the content area of this course.	我对本课程的内容非常感兴趣。	Sono molto interessato all'area dei contenuti di questo corso.
			I think I will be able to use what I	我认为我将能够在其它	Penso che sarò in grado di

			learn in this course in other courses.	课程中使用在本课程中学到的知识。	utilizzare ciò che ho imparato in questo corso in altri corsi.
			During the course, I am confident I can understand the knowledge and master the skills being taught	在课程中，我有信心可以理解老师所授知识，掌握相应的专业知识技能。	Durante il corso, sono sicuro di poter comprendere le conoscenze insegnate dal docente e di acquisire le competenze adeguate.
	1.6 Students' belief	1.6.1 Learning style	(Reversed) I like a strong structured environment and "sit to receive" the knowledge.	我喜欢在课堂上"被动坐着等待接收知识"。	Mi piace un ambiente forte e strutturato dove "ricevi" la conoscenza.
			(Reversed) I refuse to "take risks" in the course, such as asking questions when I don't understand, or discussing with the teacher during the lecture.	我拒绝在课程中"冒险"，例如在我听不懂时，我不敢提出问题或与老师讨论。	Mi rifiuto di "correre dei rischi" durante il corso, come fare la domanda quando non capisco o discutere con il docente durante la lezione.
			(Reversed) I have a strong desire for "efficient learning": I believe all problems have solutions, hope to obtain using a single method, and that the method itself will quickly lead to the answer.	我强烈希望"高效学习"：使用一种方法解决问题即可，想"迅速得出答案"。	Ho un forte desiderio di "apprendimento efficiente": credo che tutti i problemi abbiano soluzioni, spero di ottenere utilizzando un unico metodo, e che il metodo stesso "porterà rapidamente alla risposta".
		1.6.2 Students' role (open question)	The course made me feel students are the core of the teaching and learning process.	该课程使我感到学生是教学过程的核心	Il corso mi ha fatto sentire gli studenti al centro del processo di insegnamento e apprendimento.
			Do you think this course is	您认为本课程是否以学	Pensi che questo corso sia

			student-centered? How could it reflect?	生为中心？如何反映？	incentrato sullo studente? Come potrebbe riflettere?
			In Italy/China, do you think that university courses are mainly student-centered?	您认为现在中国的大学课堂能普遍做到以学生为中心吗？	In Italia, pensi che i corsi universitari siano prevalentemente studenteschi?
	1.7 Deep learning	1.7.1 Cognitive and metacognitive strategies: elaboration [SOLO: Relational]	I try to relate ideas in this subject to those in other courses or relate the material to what I already know whenever possible.	我能将本课程中各章节的知识与其它课程所学知识联系起来。	Cerco di mettere in relazione le idee in questo argomento con quelle di altri corsi, o mettere in relazione il materiale con ciò che già so quando possibile.
		1.7.2 Cognitive and metacognitive strategies: critical thinking [Relational & Extended abstract]	When a conclusion is presented in the course of the readings, I could provide good supporting evidence.	当在课程中或阅读中得到结论时，我有能力提供一些有力的支持证据。	Quando una conclusione viene presentata nel corso, potrei fornire buone prove a sostegno.
		1.7.3 Cognitive and metacognitive strategies: self-regulation	When I study for this course, I set goals for myself and decide what I am supposed to learn from them in order to direct my activities in each study period.	当我学习这门课程时，我会为自己设定目标，决定应该从中学到什么，以便指导我在每个学习期间的活动。	Quando studio per questo corso, mi pongo degli obiettivi e decido cosa dovrei imparare da esso per dirigere le mie attività in ogni periodo di studio.
		1.7.4 Resource management strategies	I make good use of my study time for this course.	对于这门课程，我能充分利用和分配时间进行学习。	Faccio buon uso del mio tempo di studio per questo corso.
	1.8 Activities	1.8.1 Types of activities (multiple	What activities are there during the class? Group discussion; Peer review; Case studies; Problem-based learning; Project-based learning;		

			choices)	Critical debate; Interview; Role play; Interactive demonstrations; The use of audio, visuals, and video; Student presentation; Brainstorming; Immediate feedback (via classroom technology); Assigning open-ended problems; Assigned readings; Assignments; Sharing lecture videos as out of class activity; Computer-supported collaborative learning; Others.		
			1.8.2 Comparison with lecture (Open question)	Compared to lectures, do you prefer these activities during the course? Why?	与传统的讲授课程相比，您更倾向于在课程中有多种形式的活动吗？为什么？	Rispetto alla lezione, preferisci queste attività durante il corso? Perché?
			1.8.3 Impact (including open question)	Which activities do you think is the most efficient for your learning or motivate your participation? Why?	您认为哪些活动对您促进学习或促进课堂参与最有效？为什么？	Quali attività ritieni siano le più efficienti per il tuo apprendimento o desiderio di partecipare? Perché?
				The activities selected by the teacher's course design helped me make progress.	老师设置的课堂活动能帮助我获得进步。	Le attività selezionate dalla progettazione del curriculum del docente mi aiutano a fare progressi.
				The activities the teacher selected could stimulate my interest and curiosity.	老师选择的课堂活动可以激发我的兴趣和好奇心。	Le attività selezionate dal docente stimolano il mio interesse e la mia curiosità.
				The course activities made me more confident.	这门课的课堂活动可以有助于我建立自信。	Le attività mi hanno dato più fiducia.
				This activities enhance my motivation to learn, retention of knowledge, depth of understanding.	老师的这些活动增强了我学习的动力、知识的保留度和理解的深度。	Le attività accresce la mia motivazione ad apprendere, la conservazione delle conoscenze, la profondità di comprensione。

		1.8.4 Engagement (including open question)	I am willing to involve in the course and share my opinions.	我很愿意参与到课堂中，分享我的观点。	Sono disposto a partecipare al corso e condividere le mie opinioni.
			The teacher could effectively lead classroom discussions.	老师能有效地指导课堂讨论。	Il docente conduce efficacemente le discussioni in classe.
			What does the teacher do to make you more involved in the course?	老师的何种行为或表现，能使您更多地参与到课堂中？	Cosa fa il docente per coinvolgerti di più nel corso?
		1.8.5 Interaction	During the course, I could explore concepts I was interested in and discuss the meaning of these concepts with the teacher.	在课程中，我可以探索自己感兴趣的知识，并与老师讨论这些知识的内涵。	Durante il corso ho esplorato concetti che mi interessavano e discutere il significato di questi concetti con il docente.
			During the course, the teacher encouraged me to participate actively, and I could express my voice easily.	在课程中，老师鼓励我积极参与，我可以更容易地表达自己的声音。	Durante il corso, il docente mi incoraggia a partecipare attivamente e ho potuto esprimere la mia voce.
	1.9 Assessment	1.9.1 Formative assessment	The teacher made me focus more on my learning needs and changing understanding rather than on a grade.	老师使我把注意力更多集中在学习需求和理解上，而不是成绩。	Il docente mi ha fatto concentrare maggiormente l'attenzione sui miei bisogni di apprendimento e sul cambiamento della comprensione piuttosto che su un voto.
			The teacher provides ongoing assessment and feedback.	老师会对学生的学习提供持续性的评估和反馈。	Il docente fornisce la valutazione e il feedback in corso.

			The teacher clearly explained how course assignments (or presentation) would be evaluated.	老师清楚地说明了如何评估课程作业和考核。	Il docente ha spiegato chiaramente come sarebbero stati valutati i compiti e la valutazione del corso.
2. Students' competence development	2.1 Self-assessment of learning outcomes (after the course)	The same as the first questionnaire (knowledge + professional skills)			
	2.2 Self-assessment of general skills (after the course)	2.2.1 Instrumental skills	After the course, I acquire the right kind of knowledge at hand and the capacity to use it flexibly in different contexts.	课程结束后，我能在不同情况下灵活运用学到的知识与能力。	Dopo il corso, ho acquisito il giusto tipo di conoscenza e la capacità di utilizzarlo in modo flessibile in diversi contesti.
		2.2.2 Interpersonal skills	After the course, I could enable to improve my team communication skills and interpersonal skills.	课程结束后，我提高了沟通能力和人际交往能力。	Dopo il corso, ho migliorato le capacità di comunicazione all'interno di un team e le capacità interpersonali.
		2.2.3 Systematic skills	After the course, I could actively construct knowledge and skills and reorganize my understanding via interactions with my environment as well as other encounters and past experiences.	课程结束后，我能结合过去的其它经历或经验，积极地构建新的知识和能力，对相关内容有了新的理解和认知。	Dopo il corso, ho potuto costruire attivamente conoscenze e abilità e riorganizzare la mia comprensione attraverso le interazioni con il mio ambiente così come altri incontri ed esperienze passate.
			After the course, I could improve my values, responsibility and	课程结束后，我可以完善自己的理念，提高责任感	Dopo il corso, ho potuto migliorare i miei valori,

			confidence.	和信心。	responsabilità e fiducia.
			After the course, I could improve my transferable skills, such as analytical skills, problem solving skills, as well as skills in deep learning, critical thinking, lifelong learning, self-directed learning, reflective learning, and self-regulation, etc.	完成课程后，我能够提高自己的通用能力，如：分析能力、解决问题能力、深度学习技能、批判性思维、终身学习理念、自我指导的学习、反思性学习和自我调节等。	Dopo il corso, ho potuto migliorare le mie competenze generiche come: capacità analitiche, capacità di problem solving, nonché abilità di apprendimento profondo, pensiero critico, apprendimento permanente, apprendimento auto-diretto, apprendimento riflessivo e autoregolamentazione, ecc.
	2.3 Self-assessment of attitude (after the course)	2.3.1 Feeling of learning experience	Which of the following emotion best described how your feeling about the course? Happy; Sad; Frustrated; Excited; Fearful; Relaxed; Cautious; Hopeful; Worried; Anticipation; Indifferent; Surprised; Tired; Energized; Other.		
		2.3.2 Belief (attitude to learning)	After the course, I learn to set the learning goals and construct my learning pace or process.	课程结束后，我学会设定学习目标并构建学习进度或过程。	Dopo il corso, potrei fissare gli obiettivi di apprendimento e costruire il mio ritmo o processo di apprendimento.
			After the course, I become a more active learner.	课程结束后，我成为一个更积极主动的学习者。	Dopo il corso, divento uno studente più attivo.
			After the course, I become more individual responsibility and accountability for my own learning.	课程结束后，我意识到要对自己的学习赋予更多个人责任感。	Dopo il corso, divento più responsabile del mio apprendimento.

			After the course, I think my interest has been stimulated by the teacher, and I am more motivated to study hard.	课程结束后，我认为自己的兴趣受到老师的激发，促进我更努力学习。	Dopo il corso, penso che il mio interesse sia stato stimolato dal docente e sono motivato a studiare sodo.

Table B2. The second questionnaire for students (English version)

Questionnaire of the course ******

Dear students,

  We are conducting an interesting study regarding the relationship between the student-centered approach and students' competence development, with the aim of improving teaching and learning. We appreciate your help finishing the first questionnaire (self-assessment of learning outcomes at the beginning of the course). The course has ended, and we sincerely invite you to finish the second questionnaire.

  Please answer according to your actual situation in the learning process. It will take about 10 to 15 minutes. All items are single-choice, except for those marked separately. Your opinions are crucial to the research. It is committed that the information is only for research, and your personal information and answers are to be confidential. We will not disclose it to any third party.

  Thank you very much, and we appreciate your help and support!

Basic information:

1. Gender: □ Male   □ Female

2. Age: _____

Questions:

1. During the course, the teacher created a supportive environment.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

2. I could feel the teacher's support for my autonomic learning.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

3. The teacher builds a course culture of positive learning.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

4. The teacher builds a course culture of collaborative learning.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

5. The teacher generates learning opportunities in an open-ended learning environment during the course.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

6. The teacher created a positive climate that has an impact on the way I learn.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

7. The teacher could actively and skillfully use their emotional expressions and verbal to lecture.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

8. The teacher's positive emotion could support to promote student's enthusiasm of learning.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

9. The teacher's positive emotions will positively impact my learning attitude.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

10. The teacher could effectively respond to the student's individual needs.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

11. I think the teacher could value the development of students' soft transversal competences, such as critical thinking, team building, etc.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

12. The teacher works as a facilitator in the course.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

13. The teacher pays attention to students' interests, needs, and abilities and respects different learning styles.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

14. The teacher encourages students to participate constantly in the learning process.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

15. The topics are covered to be used in the workplace.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

16. The materials chosen by the teachers are very useful and can increase my knowledge.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

17. The teaching materials chosen by the teacher are very relevant to the topics we are talking about.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

18. I am interested in the topics and content in the course.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

19. The teacher put forward the relevant and challenging content (learning outcomes).

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

20. There is a close connection between the topics in every unit.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

21. When I have the opportunity in this course, I will choose the course assignments I can learn from, even if they don't guarantee a good grade.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

22. I am glad that the teacher attempted to present an interesting question to motivate me to take ownership of the process of developing a response.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

23. I am very interested in the content area of this course.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

24. I think I will be able to use what I learn in this course in other courses.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

25. During the course, I am confident I can understand the knowledge and master the skills being taught.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

26. I like a strong structured environment and "sit to receive" the knowledge.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

27. I refuse to "take risks" in the course, such as asking questions when I don't understand, or discussing with the teacher during the lecture.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

28. I have a strong desire for "efficient learning": I believe all problems have solutions, hope to obtain using a single method, and that the method itself will quickly lead to the answer.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

29. The course made me feel students are the core of the teaching and learning process.

□ Totally disagree　　□ Partly disagree　　□ Partially agree　　□ Totally agree

30. Do you think this course is student-centered? How could it reflect?

_____

_____

31. In Italy/China, do you think that university courses are mainly student-centered?

_____

_____

32. I try to relate ideas in this subject to those in other courses or relate the material to what I already know whenever possible.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

33. When a conclusion is presented in the course of the readings, I could provide good supporting evidence.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

34. When I study for this course, I set goals for myself and decide what I am supposed to learn from them in order to direct my activities in each study period.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

35. I make good use of my study time for this course.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

36. What activities are there during the class? (multiple choice)

□ Group discussion   □ Peer review   □ Case studies   □ Problem-based learning

□ Project-based learning   □ Critical debate   □ Interview   □ Role play

□ Interactive demonstrations   □ The use of audio, visuals, video   □ Student presentation

□ Brainstorming   □ Immediate feedback (via classroom technology)

□ Assigning open-ended problems   □ Assigned readings   □ Assignments

□ Sharing lecture videos as out of class activity

□ Computer-supported collaborative learning

Others: _____

37. Compared to lectures, do you prefer these activities during the course? Why?

_____

_____

38. Which activities do you think is the most efficient for your learning or motivate your participation? Why?

_____

_____

39. The activities selected by the teacher's course design helped me make progress.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

40. The activities the teacher selected could stimulate my interest and curiosity.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

41. The course activities made me more confident.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

42. These activities enhance my motivation to learn, retention of knowledge, depth of understanding.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

43. I am willing to involve in the course and share my opinions.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

44. The teacher could effectively lead classroom discussions.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

45. What does the teacher do to make you more involved in the course?

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

46. During the course, I could explore concepts I was interested in and discuss the meaning of these concepts with the teacher.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

47. During the course, the teacher encouraged me to participate actively, and I could express my voice easily.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

48. The teacher made me focus more on my learning needs and changing understanding rather than on a grade.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

49. The teacher provides ongoing assessment and feedback.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

50. The teacher clearly explained how course assignments (or presentation) would be evaluated.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

51. Self-assessment of the learning outcomes after the course (The amount of questions for each course is determined by the intended learning outcomes designed by the teacher).

Intended learning outcome 1.

□ Totally not understood □ Partly understood □ Basically understood □ Totally understood

52. Intended learning outcome 2.

□ Totally not understood □ Partly understood □ Basically understood □ Totally understood

53. Intended learning outcome 3.

□ Totally not understood □ Partly understood □ Basically understood □ Totally understood

54. Intended learning outcome 4.

□ Totally not understood □ Partly understood □ Basically understood □ Totally understood

55. Intended learning outcome 5.

□ Totally not understood □ Partly understood □ Basically understood □ Totally understood

56. Intended learning outcome 6.

□ Totally not understood □ Partly understood □ Basically understood □ Totally understood

......

57. After the course, I acquire the right kind of knowledge at hand and the capacity to use it flexibly in different contexts.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

58. After the course, I could enable to improve my team communication skills and interpersonal skills.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

59. After the course, I could actively construct knowledge and skills and reorganize my understanding via interactions with my environment as well as other encounters and past experiences.

□ Totally disagree □ Partly disagree □ Partially agree □ Totally agree

60. After the course, I could improve my values, responsibility and confidence.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

61. After the course, I could improve my transferable skills, such as analytical skills, problem solving skills, as well as skills in deep learning, critical thinking, lifelong learning, self-directed learning, reflective learning, and self-regulation, etc.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

62. Which of the following emotion best described how your feeling about the course?

□ Happy   □ Sad   □ Frustrated   □ Excited   □ Fearful   □ Relaxed

□ Cautious   □ Hopeful   □ Worried   □ Anticipation   □ Indifferent

□ Surprised   □ Tired   □ Energized   □ Other: _____

63. After the course, I learn to set the learning goals and construct my learning pace or process.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

64. After the course, I become a more active learner.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

65. After the course, I become more individual responsibility and accountability for my own learning.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

66. After the course, I think my interest has been stimulated by the teacher, and I am more motivated to study hard.

□ Totally disagree   □ Partly disagree   □ Partially agree   □ Totally agree

End

Thank you for your support and collaboration!

Appendix C

Table C. The interview outline for teachers

Interview
Dear professor,

I am researching the relationship between the student-centered approach and students' competence development. The research probes into the problem of "if the teachers encourage the student-centered approach, how teacher trains the students, guide them to assimilate the knowledge, and develops their competence" to make feasible suggestions for improving teaching effectiveness and quality.

Please answer according to your actual situation in the teaching process. Your opinions are significant. The interview information is only for research, so your personal information and answers are to be confidential, and we will not disclose it to any third party.

Thank you very much, and we appreciate your help and support!

Basic information:

1. Gender: □ Male   □ Female

2. Position:

　□ Professore ordinario

　□ Professore associato confermato

　□ Ricercatore universitario confermato

　□ Ricercatore a tempo determinato di tipo B/A

　□ Contratto per attivita' di insegnamento, L. 240/10

　□ Assegnista di ricerca con incarico di docenza

3. Highest Education:

　□ Bachelor Degree

　□ Master Degree

　□ Doctoral Degree

4. Years of Working: [relate to teaching in higher education institution]

　□ 1–5 Years

　□ 5–10 Years

　□ 10–20 Years

　□ 20–30 Years

　□ More than 30 Years

Questions:

1. There is no consensus on the definition of the student-centered approach, so how do you view this concept?

2. How did you achieve students' competence development in your student-centered course?

3. What kind of interventions do you think in the course can stimulate students' intrinsic motivation and promote students' deep learning? Please share some examples. (You can also share how you designed these intervention activities)

4. Based on the self-assessment data of students' learning achievements, do you think the student-centered approach is more conducive to the development of students' competence? Why?

5. In your opinion, does the institutional policy support the student-centered approach? (Or you can talk about the environment, system, or culture, etc.)

End
Thank you for your support and collaboration!