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Thesis: Wu, J. (2023) "The Research-teaching Nexus: Student Experiences and Engagement from the Perspective of Business School Undergraduates at Research-intensive Universities in China and the UK", University of Southampton, Faculty of Social Sciences, Southampton Education School, PhD Thesis, pp.47.

Data: Wu, J. (2023) Datasets of undergraduate research-teaching nexus experiences and engagement in China and the UK. DOI:
<https://doi.org/10.5258/SOTON/D2531>

University of Southampton

Faculty of Social Sciences

Southampton Education School

The Research-teaching Nexus:

**Student Experiences and Engagement from the Perspective of
Business School Undergraduates at Research-intensive Universities
in China and the UK**

DOI: <https://doi.org/10.5258/SOTON/D2531>

by

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Thesis for the degree of Doctor of Philosophy in Education

February 2023

University of Southampton

Abstract

Faculty of Social Sciences

Southampton Education School

Thesis for the degree of Doctor of Philosophy in Education

The Research-teaching Nexus: Student Experiences and Engagement from the Perspective of Business School Undergraduates at Research-intensive Universities in China and the UK

Jingwen Wu

The study investigates undergraduate experiences of, and engagement with the research-teaching nexus in business schools at research-intensive universities in China and the UK. Specifically, the study asks the following questions:

1. What nexus types are experienced by the undergraduates?
2. How do the undergraduates engage with the experienced research-teaching nexuses?
3. What are the relationships between the nexus types experienced by the undergraduates and the ways of nexus engagement?

A two-phase sequential mixed methods research design following a pragmatic approach was employed. Undergraduate students from two Double First Class universities in China and two Russell Group universities in the UK were recruited. Phase 1 involved focus group interviews, with six focus groups (42 participants) in China and twelve focus groups (38 participants) in the UK. Phase 2 involved a questionnaire-based survey of 570 students (408 from China and 162 from the UK).

Per research question the findings suggest:

1. Business school undergraduates at research-intensive universities in China and the UK can experience elements from all the nexus types within Healey's (2005) theoretical framework, with different hybrids of the nexus types. An additional nexus type of 'Extra-curricular Integration' is also possible.
2. Business school undergraduates in China and the UK can engage with the overall research-teaching nexus in the same way as each other – and in a way that is largely in line with the attributes

proposed by the Student Perception of Research Integration Questionnaire (SPRIQ) by Visser-Wijnveen et al. (2016). The engagement reflects: Awareness of Research, Participation in Research, Quality of Teaching Delivery, Motivation from Research-teaching Integration, and Beliefs of Importance of Research-teaching Integration.

3. How business school undergraduates in China and the UK engage with the types of research-teaching nexuses that they experience can be both similar and different. Common across both countries is the suggestion that engaging with the research-teaching nexus can be more important for increasing students' awareness of research and participation in research, than for increasing their perceived teaching quality, motivation, and beliefs of the nexus importance. For business school undergraduates in China, the research-teaching nexus experiences can contribute more to their research awareness and participation, and can be more motivating than for their UK contemporaries. By contrast, for business school undergraduates in the UK, engaging with their research-teaching nexus can have a larger impact on beliefs of the importance of integrating research and teaching compared to their Chinese university counterparts.

The findings support the idea that nurturing the research-reaching nexus within and outside the curriculum can foster increased undergraduate awareness of, and participation in research, perceived teaching quality, interests in research and disciplinary areas, and beliefs of the importance of the research-teaching integration. This nurtured nexus does not need to take a common form, and more options available for student experience are advocated. The similarities and differences revealed across China and the UK also help provide references for the HE sector and institutions in these countries (and in others) to evaluate and enhance their research-teaching nexus practice and student experience.

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Research Thesis: Declaration of Authorship

Print name: Jingwen Wu

Title of thesis: The research-teaching nexus: Student experiences and engagement from the perspective of business school undergraduates at research-intensive universities in China and the UK

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission.

Signature:

Date:

Acknowledgements

Harder than completing the PhD thesis, is to fully express my enooooormous gratitude for my both supervisors, Dr James Hall and Professor John Schulz. Both of them have provided infinite support and encouragement along my PhD journey, for study and also for life. They have endless patience and tolerance for my draft deliveries. They have the most generous and extremely helpful comments for each piece of work I send. They have always trusted me even when I have doubts about myself. More than a supervisory team, they are like family members to me.

I would also like to express my great gratitude to Professor Chris Downey and Dr Fiona Jordan for their time and huge help in the process of examining the thesis and the viva. They have provided insightful and explicit advice on further improving the thesis quality, and granted me a precious and happy viva experience.

I sincerely appreciate Professor Bruce Macfarlane, Professor Christian Bokhove, Professor Lianghuo Fan, Dr Athina Thoma, Professor Anthony Kelly, and Dr Maria Kaparou for their kind help in my thesis development and extra-curricular research and teaching activities. Meanwhile, I would like to express my great thankfulness to the administrative team in the Education School, the Faculty of Social Sciences, and the whole university for their kind assistance throughout my study at the University of Southampton.

My deep appreciation also goes to the most lovely anonymous participants, university gatekeepers, questionnaire pilot interview participants, my back-translation friend, and anyone who have helped contribute to my thesis. Without their participation, I cannot complete the study. While they are anonymised and I do not know their names really, they will always be appreciated.

Finally, I would like to give my ultimate love and thanks to my family. You are my ultimate meaning. I am also grateful for my Seven, the Chao Shuai Qin Wang and the future Turing Award winner.

Abbreviations and Acronyms

CFA -- Confirmatory Factor Analysis

EFA -- Exploratory Factor Analysis

EFAM – Economics, Finance, Accounting, and Management

HE – Higher Education

HEI – Higher Education Institutions

ML – Maximum Likelihood

NCEE – National College Entrance Examination

NGEE – National Graduate Entrance Examination

PCA – Principal Component Analysis

SPRIQ – Student Perception of Research Integration Questionnaire

Chapter 1 Introduction

1.1 Setting the scene

1.1.1 The notion of the research-teaching nexus

The relationship between research and teaching (the 'research-teaching nexus') has always been an intriguing yet debated topic in higher education studies. It is not new, as the roles of research and teaching and the relationship between them had been discussed by philosophers and academics for centuries. The heat of the discussion has never decreased, either. The recent decades saw a further increase in the number of related publications with a widening range of foci and perspectives. Furthermore, the characteristics of the research-teaching nexus vary considerably across different geographical and disciplinary contexts. Developing a thorough understanding of the complex and subtle nexus is still a challenging task. As Brew (2006, p.3) demonstrates, *'the relationship between teaching and research is intricately embedded within ideas about what universities do and what they are for'*.

Tight (2016) explains that the 'research-teaching nexus' and 'teaching-research nexus' are widely considered interchangeable terms, while the emphases might be slightly different depending on the order. The Oxford dictionary suggests that the word 'nexus' has two meanings. A nexus can be *'a connection or series of connections linking two or more things'*, or *'a central or focal point'* (Oxford Living Dictionaries, 2018). In higher education, nexus is usually understood as the intentionally constructed relationship or connection between research and teaching (Neumann, 1992; Clark, 1997; Malcolm, 2014; Tight, 2016). Cited in Tight (2016), the earliest usage of the word 'nexus' in describing the relationship between research and teaching was by Jauch and Gentry (1976). This term gained wide acceptance around the early 1990s when Lindsay and Neumann (1988) and Neumann's (1992) related studies acquired great attention. In the current study, 'research-teaching nexus' is utilised interchangeably with 'research-teaching integration' or 'integration between research and teaching'.

1.1.2 Framing the scopes of universities and disciplines

Research-intensive universities in higher education

As a broad concept, ‘higher education’ is used extensively to represent post-secondary education. A higher education institution can be a comprehensive university, a polytechnic or normal college, or other institutions that provide degree programmes at the tertiary education level (HEFCE, 2018). Research-intensive universities, usually in comparison with teaching-led universities, have their distinctive characteristics. For example, in comparison with teaching-led universities, research is emphasised at the institutional mission level at research-intensive universities (Taylor, 2006). More resources are put into research projects and reward schemes are likely to lean towards research over teaching. Academics are usually under more pressure to carry out research activities (Lai, Du and Li, These characteristics will certainly shape the relationship between research and teaching within the institutions, and thus make a difference in student experiences of the nexus. For example, Brew (2010) suggests the perceived research atmosphere of the universities will help motivate students’ interest in learning about research.

The current study focuses on research-intensive universities for three reasons. First, research-intensive universities are usually ‘good’ universities in public opinion, because they have good reputations and high rankings in many league tables. While many studies have implied that undergraduate students are usually relatively distant from research regardless of the university type (e.g. Lindsay, Breen and Jenkins, 2002; Van der Rijst, Visser-Wijnveen, Verloop and Van Driel, 2013; Visser-Wijnveen, Van der Rijst and Van Driel, 2016), it is not clear whether or to what extent a research-emphasised atmosphere brings undergraduate students improved or impaired experiences of the research-teaching nexus. Second, the researcher has extensive study and work experience at research-intensive universities in both China and the UK, which encourages a deep interest in gaining a more comprehensive and thorough understanding of the research-teaching nexus in these particular contexts. Third, for operational consideration, the researcher’s experiences can help gain access to research-intensive universities and approach potential participants in the sampling process of the study.

Research-intensive universities in China: From Project 211 and 985 to Double First Class

The last few decades saw rapid economic growth in mainland China. The significant economic boost enabled parallel development in many other aspects including higher education. Realising that sustainable economic development had to be supported by high-quality education and intellectual resources, a number of new policies and plans had been implemented to support the reform and

development of higher education in China. In 1995, the central government announced Project 211 (representing 100 competitive universities in the 21st century), aiming at building a number of domestic ‘*high-level universities and key disciplinary fields*’ (Zhang, Patton and Kenney, 2012, p. 767). A few years later, Project 985 was launched following the then Chinese chairman Zemin Jiang’s speech in May 1998. Demonstrating a more ambitious goal than Project 211, Project 985 looked towards establishing a few ‘*world-class*’ universities (Zhang et al., 2012, p. 767), which were expected to be globally influential. There were 112 universities and 39 universities selected in Project 211 and Project 985 respectively¹. Both projects highlighted enhancing the research and development capacities of Chinese universities. Besides the universities, the central government also played extremely important roles in coordinating and providing financial and policy support to implement the project plans (Douglass, 2012; Zhang et al., 2012). Despite some critiques including imbalanced regional distribution of the selected universities, both Project 211 and Project 985 have acquired great achievement over 20 years. The overall quality of higher education in China has considerably increased. The influence of Chinese universities, especially research impact, has rapidly improved in the global context (Zhang et al., 2012).

With strengthened capacities and seeking further progress, in 2015 the central government initiated a succeeding strategic plan ‘Double First Class’ (Double World Class/Shuang Yi Liu), representing first-class universities and first-class disciplines (MOE, 2015). In 2017, out of 3012 higher education institutions (HEIs) in China, 36 universities were revealed to be Category-A universities and 140 disciplines² in the Double First Class project (MOE, 2017). In 2022, MOE announced the reviewed list of the Double First Class universities and disciplines, with some adjustments in the previous list and an increase in the number of entitled disciplines to 147 (MOE, 2022). Illustrated by the Australian Department of Education and Training (2017) and Peters and Besley (2018), the long-term plan of the Double First Class project has three steps. By 2020, a number of world first-class universities and disciplines are expected to be developed, which should be embedded with unique Chinese characteristics. By 2030, more universities and disciplines are expected to enter the world-class levels, and some to enter the top ranks. By 2050, the overall quality and influence of Chinese universities and discipline construction should be at a leading place in the world. Therefore, Double

¹ All Project 985 universities are also Project 211 universities.

² There are another six Category-B Double First Class universities, mainly decided upon political consideration instead of academic excellence. The 140 disciplines come from both within the Double First Class universities and some other universities. In other words, a university can have Double First Class disciplines but the university itself is not necessarily a Double First Class university.

First Class universities largely represent the best universities in China with the most excellent resources and capabilities for research and teaching.

Research-intensive universities in the UK: The Russell Group

‘The Russell Group represents 24 leading UK universities which are committed to maintaining the very best research, an outstanding teaching and learning experience and unrivalled links with business and the public sector.’

-- Russell Group (2018)

As the statement on their official website, the Russell Group universities explicitly convey their prestige statuses and emphasizes on the importance of research. Formed in 1994 and expanded to 24 universities now, the Russell Group has included Oxford, Cambridge, and a considerable number of the redbrick universities (Truscot, 1951). ‘Research-intensive’ has always been a remarkable label of the member universities. Based on the Russell Group Profile report in 2017, while the number of Russell Group universities only takes up 15% of the HEIs in the UK, they occupy a great proportion of research funding from various sources. For example, in 2015-2016, they acquired 76% of the research funding and contract income (£4.45 billion), 71% of the EU research grant and contract income (more than £600 million) and 68% of the quality-related research grant from the UK Funding Councils (around £1.3 billion). The transfer of research output into innovative products and services is also highlighted as a close and profitable bond with the industrial and public sectors. It is reported the total economic impact of Russell Group universities’ research activities in 2015-2016 was estimated at £34.09 billion (Russell Group, 2017).

In terms of student learning, as stated in the Profile, Russell Group universities’ *‘combination of teaching and research excellence creates an ideal learning environment’* (Russell Group, 2017, p11). Research-integrated teaching is highly valued and proudly practised at Russell Group universities. Nevertheless, contradictory outcomes from the external assessment schemes are also spotted. In comparison to their predominately top rankings in the Research Excellence Framework (REF) in 2014 (REF, 2014), many Russell Group universities were only awarded Silver or even Bronze in the Teaching Excellence Framework (TEF) between 2017 and 2019 (OfS, 2022). In other words, the actual ‘quality’ or experiences of the research-teaching nexus at Russell Group universities are still in doubt.

Business schools in the UK and Chinese universities

Business schools have always been important in the international higher education context. As Vinten (2000) suggests, in the era of economic globalisation, business schools are able to ‘make the best response to ensure national competitiveness’ (p.180). Business schools are popular subject choices for students. For one reason, principles of economics, finance and management are closely connected with people’s everyday life. That is to say, there are more opportunities from which students can naturally develop an intrinsic interest in the disciplinary area. Also, students will consider knowledge and skills within these subjects as very practical. For another reason, studying at business schools helps provide a wide range of promising job opportunities including entrepreneurship possibilities (Kim, Markham and Cangelosi, 2002). As knowledge and skills taught at business schools are usually highly transferable, they do not limit job sectors and are valuable for both work and life. Therefore, there are large numbers of students studying at business schools in both China and the UK. In 2020, there were nearly 230,000 students enrolled in economics related programmes and 660,000 students enrolled in management related programmes in China (MOE, 2021), while nearly 80,000 students enrolled in business and management programmes in the UK (UCAS, 2021). With the considerable size of the students enrolled, business schools are not only important components at universities or within the higher education sector, but also influential in the future labour market and the whole society.

Given possible differences among the organisational structure at different higher education institutions, this study focuses on business schools incorporating programmes related to economics, finance, accounting, and management (EFAM) subjects. It is aware that there are slight disciplinary differences across the EFAM subjects. For example, in terms of research methods and techniques, economics subjects tend to require higher levels of statistical analysis as more mathematical predictive models are expected (Becker and Watts, 1996). Nevertheless, EFAM subjects share more similarities than dissimilarities in terms of common knowledge. Belonging to the social science domain, disciplinary knowledge in EFAM subjects leans to be the ‘Mode 2 knowledge’, which is concerned with real world problem oriented, infused in sources, and contextualised and interdisciplinary based (Gibbons et al., 1994).

As mentioned by Burke and Rau (2010) and Chen (2018), in the context of business schools, there might be gaps between academic research and real world practice. However, these scholars believe that with enhanced research-teaching nexuses, the gaps between research and practice can be narrowed down. With its importance in the high education context and in the wider society as discussed above, business schools are decided as the disciplinary areas of this study. The study

intends to provide evidence-based implications on understanding and improving undergraduate research-teaching nexus experiences and engagement in business schools at research-intensive universities in China and the UK. In turn, the clarified and extended knowledge about the student perceptions of the research-teaching nexus helps enhance the nexus, which contributes to minimising the gaps between research and practice in EFAM subjects (Burke and Rau, 2010; Chen, 2018).

1.2 Rationale and original contributions to knowledge

1.2.1 Rationale and research gaps

Whilst student experience has been increasingly accentuated in the marketised higher education era (BIS, 2011; Williams, 2013), in terms of the research-teaching nexus, student perceptions and experiences do not receive much attention in the literature. There have been extensive studies that investigate academic beliefs and practices of the research-teaching nexus. Student learning outcomes and university management related to the research-teaching nexus are also frequently reported, which are still from the perspective of academics. Only a small number of studies have been carried out to investigate student perceptions and experiences of the research-teaching nexus (e.g. Jenkins, Blackman, Lindsay and Paton-Saltzberg, 1998; Breen and Lindsay, 1999; Lindsay et al., 2002; Healey, 2005; Healey, Jordan, Pell and Short, 2010). Particularly, the studies were conducted by a small group of scholars at limited universities within specific geographical regions. There has been a growing trend of student-focused nexus studies worldwide (e.g. Van der Rijst et al., 2013; Visser-Wijnveen et al., 2016; Speake, 2015; Brew, 2016). Not until very recent years are there more studies demonstrating student awareness, experiences and attitudes towards the research-teaching nexus (e.g. Clark and Hordosy, 2019; Miulescu, 2019; Griffioen, 2020). While the blooming stage of student-focused nexus studies takes place a few years after the current study starts, undergraduate voices still remain under-represented.

In the Chinese context, only a handful of studies have looked into the research-teaching nexus and all of them have focused on the academic perspective (e.g. Hu, Van der Rijst, Van Veen and Verloop, 2014; Li, McCormick and Barnett, 2015; Zhang and Shin, 2015; Chen, 2018; Hu, Van der Rijst, Van Veen and Verloop, 2019). Hardly any empirical study can be found taking a student view to investigate the research-teaching nexus in China. Therefore, fruitful knowledge about the research-teaching nexus can be explored from the students in China. Additionally, Double First Class universities have drawn nationwide or even worldwide attention since the launch of the project, and

have attracted further spotlight with the reviewed list announced in early 2022 (MOE, 2022). Understanding and elevating the relationship between research and teaching at Double First Class universities can help the universities and the nation achieve the goals of the project, as well as provide students with pleasant and rewarding university study experiences.

Correspondingly, whilst there are several student-focused research-teaching nexus studies conducted in the UK contexts (e.g. Jenkins et al., 1998; Lindsay et al., 2002; Healey et al., 2010; Clark and Hordosy, 2019), studies at research-intensive universities with a specific disciplinary focus are rarely seen. Particularly, as mentioned earlier, the contradictory assessment outcomes between REF and TEF raise questions about how undergraduates actually perceive and experience the research-teaching nexus at research-intensive universities, rather than what the universities announce. An honest and up-to-date interpretation of the student nexus experiences and engagement will help Russell Group universities review and possibly realign their research and teaching orientations, and also improve overall student satisfaction with university study.

With their high qualities and considerable sizes, HEIs in China and the UK have always had significant influence in the global higher education context. Comparing and contrasting undergraduate experiences and engagement of the research-teaching nexus between the two countries will provide novel empirical evidence for understanding the research-teaching nexus from different dimensions.

1.2.2 Original contributions to knowledge

As Phillips and Pugh (2010) summarise, an original contribution to knowledge from a PhD project can be achieved via providing original empirical experience, exploring new areas or developing new ideas, demonstrating novel interpretations for existing theories, or adopting different methodologies. The study makes theoretical and empirical contributions in the following aspects.

The study contributes to narrowing the research gaps in research-teaching nexus studies, in terms of the undergraduate perspective, the Chinese context, as well as the specific disciplines and types of universities in both China and the UK. The comprehensive description of business school undergraduate nexus experiences and engagement provides timely empirical evidence for understanding the research-teaching nexus topic at research-intensive universities in China and the UK. Comparisons of experiences across these two countries also help readers from different geographical locations evaluate to what extent the findings from this work are applicable or transferrable in their own contexts.

The study proposes a new nexus type of Extra-curricular Integration in addition to Healey's (2005) nexus framework within the curriculum. The two-phase sequential mixed methods research design provides both breadth and depth in understanding the business school undergraduate research-teaching nexus experiences and engagement at research-intensive universities in China and the UK. Furthermore, the study provides implications for different stakeholder groups in higher education. Details about the strengths and contributions of the study are presented in Section 6.3.

1.3 Research aim and research questions

While the research aim determines the leading direction of a study, the research questions provide a sensible and feasible guideline for exploring the topic step by step. This study aims to enhance the understanding of business school undergraduate experiences of, and engagement with, the research-teaching nexus at research-intensive universities in China and the UK. To achieve the overarching research aim, the research questions are:

- RQ1. What types of research-teaching nexus do business school undergraduate students experience at research-intensive universities in China and the UK?
- RQ2. How do business school undergraduates engage with the research-teaching nexuses that they experience at research-intensive universities in China and the UK?
- RQ3. Are there any relationships between different nexus types and the ways business school undergraduate students engage with the nexuses at research-intensive universities in China and the UK?

Together, the research aim and the research questions help frame the scale and scope of the study. A detailed illustration of how the research aim and the research questions guide the research design is presented in Section 3.3.

1.4 Concluding comments and thesis structure

This chapter has introduced the background, rationale, aim and research questions of this PhD thesis. While there are extensive theoretical and empirical studies from the perspectives of academics, university managers and policymakers, students' opinions are still under-represented. In this chapter, the contexts of the business schools at research-intensive universities in China and the

UK are framed, with their particular characteristics introduced respectively. Rationale, research gaps in the existing literature and original contribution to knowledge are explained.

The thesis is comprised of six chapters. Chapter 1 sets the scene for the study, outlining the background, rationale, and research aim and research questions for the readers to have an overall idea of what the study is about.

Chapter 2 thoroughly reviews literature that is related to the concepts and topics of the study. Specifically, the definition of 'research', 'teaching', and 'scholarship' is discussed. Upon a historical overview of the relationship between research and teaching in higher education in China and the UK, the discussion of the modern notion of the 'nexus' is presented, including the theoretical framework adopted by this study. Application and operationalisation of the theoretical framework in various studies are introduced. Research gaps are identified through the literature review.

Chapter 3 describes and justifies methodological consideration of the study, including the research aim and research questions, the two-phase sequential mixed methods design with a pragmatic approach (Phase 1 focus group interviews and Phase 2 survey), participant recruitment (university selection and students as participants), data collection (focus group interviews and questionnaire), the thematic analysis and statistical analysis in different study phases, techniques to ensure the trustworthiness of the study's findings, as well as consideration of research ethics.

Chapter 4 and Chapter 5 present the research findings from Phase 1 thematic analysis and Phase 2 statistical analysis respectively. In particular, Phase 1 findings address the first two research questions and inform the questionnaire design, which enables the proceeding of the Phase 2 survey. Phase 2 findings respond to all three research questions.

In Chapter 6, key findings from Phase 1 and Phase 2 are summarised. Based on the synthesised findings, an in-depth discussion is provided that compares and contrasts the opinions and evidence provided by previous studies. The strengths and limitations of the study are then presented. In addition, implications for academics as teaching staff, departmental/institutional managers and policymakers at regional and national levels, and fellow researchers are provided.

Chapter 2 Literature Review

2.1 Introduction

This chapter provides a comprehensive and in-depth literature review on the research-teaching nexus, with an emphasis on the specific Chinese and the UK higher education contexts, the theoretical framework, and existing studies which have focused on student perspectives. Starting with a review of the definitions of 'research', 'teaching' and 'scholarship' in Section 2.2, different understandings of these most common concepts in the higher education context will be discussed. Section 2.3 reviews the historical development of research, teaching and their relationships at universities in China and the UK. Following explanations of the complex nature and the disciplinary differences of the research-teaching nexus in Section 2.4, Section 2.5 introduces the research-teaching nexus theoretical framework by Griffiths (2004) and Healey (2005). Then, in Section 2.6 empirical studies related to the framework are illustrated regarding different types of nexus. Section 2.7 and 2.8 particularly focuses on the studies that operationalise students' experiences and perceptions of the research-teaching nexus. Last but not least, concluding comments and research gaps are demonstrated in Section 2.9.

2.2 Defining 'research', 'teaching' and 'scholarship'

'Research' and 'teaching' seem to be the most commonly seen words in the higher education context, and in higher education studies. Nevertheless, neither of them is conceptualised or understood in a universal way. It is usually considered difficult and problematic to explicitly define these terms (Carter, 1980; Lindsay and Neumann, 1988; Robertson & Bond, 2001; Jenkins, Breen, Lindsay & Brew, 2003; Brew, 2006). As Lindsay and Neumann (1988) put it, different interpretations demonstrate different philosophical and political views. For example, Colbeck (1998) suggested that a more inclusive understanding of research will make it more likely to be integrated with teaching. Therefore, capturing the differences in the definitions would help reflect and understand the ways how people value and experience the relationships between research and teaching (Brew, 2003).

2.2.1 Research

Regarding 'research', many scholars have acknowledged the broad spectrum and multi-aspects of its notion. Instead of asserting 'what is research', they attempt to explore the nature and versatile

facets of research. For example, Truscot (1951) emphasised the essence of research is '*the spirit of inquiry*' (p. 144). In terms of activities, he suggested any kind of original scholarly work would count as research, including both the process of investigation and the product of publication, both exploring undiscovered knowledge and demonstrating novel thoughts about existing knowledge, and both personal endeavour as well as encouraging and supporting others' engagement. Not at odds with Truscot (1951), Carter (1980) called the phenomenon a '*portmanteau*' (p. 93) because of the complexity of its meanings. He summarised ten dimensions of research, which are scholarship, theory construction, theory testing, observing and recording, experiment, design, development, criticism and elucidation, artistic creation and consultancy. It is worth noticing the word 'scholarship' usually brings further confusion to understanding 'research', and understanding the relationship between research and teaching. Scholarship and its connection with research and teaching will be discussed later in Section 2.2.3. Besides, Carter's (1980) interpretation indicates the divergent explanation and focuses of 'research' across different disciplines. For example, theory testing and experiment tend to be more science subjects related, while criticism and elucidation are more likely to be seen in literary and art subjects. Many other scholars (e.g. Lindsay and Neumann, 1988; Brew, 2001; Jenkins et al., 2003; Griffiths, 2004; Healey, 2005) agree that the definition of 'research' is usually contextualised and discipline-based, influenced by different disciplinary cultures and epistemologies. Their viewpoint is also supported by empirical evidence from other studies (e.g. Becher, 1987; Rowland, 1996).

Amongst the scholars who hold a broader view of 'research', many illustrate 'research' with its contribution to 'knowledge'. Research is concerned with the preservation, advancement, generation and validation of knowledge (Lindsay and Neumann, 1988; Brew, 2001 & 2006). From their perspectives, 'research' does not only include the outcomes of new discoveries, but also embraces the means and process of pursuing the unknown and renewing the already known. This is not at odds with the definition of research in the UK's Research Excellence Framework (REF) document, where '*Research is defined as a process of investigation leading to new insights, effectively shared*' (REF, 2017/04, p.3)

Meanwhile, 'research' can be interpreted in much narrower ways. As Tennant, McMullen and Kaczynski (2010) mentioned, it is very common that 'research active' equals 'research output quantitative'. Whilst few would admit that they only count publications or project funding as 'research', the variables used for analysing research achievement or quality in empirical studies indicate research is frequently considered as objective quantifiable end products (Boyer, 1990; Hattie and Marsh, 1996; Brew, 2006). Linking with knowledge, the narrower view regards only new

knowledge, such as new discoveries, inventions or theories, as the contribution of research. It excludes the investigation and reflection of the existing knowledge. This view of 'research' is largely equivalent to 'scientific research' in the opinions of Lindsay and Neumann (1988).

In China, scholars suggest that the concept of 'research' (Keyan) rarely existed until the adoption of the Humboldtian ideas in the early 1900s (Shang, 2007; Zhou, 2017). The Humboldtian ideas were introduced from the western world together with many other aspects by the late Qing Dynasty Emperor and the government of the Republic of China. Literally, the Chinese 'Ke' means 'science' or 'scientific', and 'Yan' means 'studying on' or 'research'. While the word 'Keyan' reflects the rise of science in the Humboldtian reform, it is used to indicate research activities in all disciplines, not only limited to the science disciplines. Similar to scholars worldwide, different Chinese academics consider 'what is research' differently. For example, many scholars including Sun and Chen (2006), Ge (2007), Lai, Du and Li (2014), and Zhou (2017) acknowledged the complex meaning of research. They agreed that all the processes and products which relate to original knowledge innovation could count as research. Nevertheless, some scholars tended to focus on the quantifiable aspects of research, such as publications, projects and grants (Wang, Wang, Zhai and Feng, 2004).

2.2.2 Teaching

In comparison with the various interpretations of 'research', the understanding of 'teaching' seems to be more unified and not many definitions can be found in publications. Corresponding to the relationship between 'research' and 'knowledge', scholars also illustrate the concept of 'teaching' with its relationship with 'knowledge'. For example, Brew (2001) and Prosser and Trigwell (1999) specified teaching as activities of transmission and exploration of knowledge. Hughes (2005) highlighted the knowledge exploration function of teaching, and advocated that similar to research, teaching should be considered as a process rather than simply quantifiable end products.

While limited scholars have discussed the definition of teaching, the characteristics of teaching activities and teaching quality can be traced from some related documents. For example, in the UK, the National Student Survey (NSS) questionnaire asks undergraduate students the following four questions to describe their teaching (NSS, 2018):

1. Staff are good at explaining things.
2. My course has challenged me to achieve my best work.
3. Staff have made the subject interesting.

4. The course is intellectually stimulating.

The Student Course Experience Questionnaire (SCEQ) at the University of Sydney in Australia has six items for the good teaching scale (Ginns, Prosser and Barrie, 2007), which are:

1. The teaching staff normally give me helpful feedback on how I am going.
2. The teaching staff of this degree course motivate me to do my best work.
3. The staff make a real effort to understand difficulties I may be having with my work.
4. My lecturers are extremely good at explaining things.
5. The teaching staff work hard to make their subjects interesting.
6. The staff put a lot of time into commenting on my work.

From these two questionnaires which are designed for students to assess their teaching activities, the criteria of lecturers' clear explanation of knowledge and lecturers' efforts and abilities to make the subjects interesting are both mentioned. It is worth noting that there is an argument about whether these requirements are necessary or even compatible with the requirements for good researchers or conducting good research. This would possibly be a question or challenge for academics who would like to achieve excellence in both research and teaching. In the Australian survey, adequate and effective feedback from the lecturers is also highlighted. Again, will the effort and time spent on communication with students compete with those spent on research? Some empirical evidence is displayed in Section 2.4.

2.2.3 Scholarship

As mentioned earlier, the notion of 'scholarship' plays a blurring role which cannot be neglected in understanding research, teaching and the research-teaching nexus. In academia, people have highly valued scholarship and have heatedly discussed what constitutes scholarship for a long time. Andresen (2000) and Brew (2006) reported that some scholars tend to treat 'scholarship' and 'research' as interchangeable words and highlight empirical research projects and output like publications. The current study believes these two concepts are closely related but different. The understanding of the meanings of 'scholarship' and 'research' and their relationship will yield impacts on the research-teaching nexus as well. For example, Andresen (2000) illustrated scholarship as the expectations and requirements of what 'can and should be achieved in academic

work' (p138). From this point of view, comprehension of scholarship suggests beliefs and values about academics' roles, and therefore it nuances the balance between research and teaching.

Scholars including Carter (1980), Elton (1986) and Brew (2006) considered 'scholarship' as part of 'research', while many others suggested the other way around. One of the most influential theoretical construction of scholarship comes from Boyer (1990), who redefined and enlarged the vision of scholarship and categorised scholarship into four types based on nationwide investigation in the US.

The first type, the scholarship of discovery is introduced as the closest equivalent to research, highlighting the aspects of advancing knowledge and creating an intellectually stimulating atmosphere in the higher education context. Boyer (1990) explicitly demonstrated that scholarly research is constituted of the process, the outcomes, and more importantly the 'passion' (p17). This also echoed Truscot's (1951) understanding of research almost half a century ago. Second, the scholarship of integration is about breaking the barriers amongst different disciplines, which helps illuminate scholars' thinking from a broader view and explore the unknown more freely. Third, the scholarship of application refers to linking theories and practice, and thus making scholarly work more meaningful to a wider group of people. Finally, Boyer (1990) emphasised the scholarship of teaching, which is usually considered the greatest contribution of his work. In spite of the fact that teaching has always been one of the primary roles in academic work, Boyer (1990) rejuvenated the classic Humboldtian philosophy that teaching and research are entwined in the research-dominating era. As he stated, the four categories of scholarship are inseparable, and the scholarship of teaching deserves equal attention as the scholarship of discovery.

Criticisms of Boyer's (1990) theory included that it was not very realistic in practice (Brew, 2001) and that the scholarship of teaching did not equate with excellent teaching (Hutchings and Shulman, 1999). Nevertheless, Boyer (1990) provides a normative model for scholarship and many scholars have expressed confidence that scholarship can act as a bridge closely bonding research and teaching together (Scott and Awbrey, 1993; Jenkins, 2004; Elton, 2005; Brew, 2006).

2.3 A historical overview of the relationship between research and teaching in higher education

2.3.1 Historical development of the research, teaching and their relationships in the west (with a UK focus)

The medieval Enlightenment: Teaching as the tradition

As suggested by Tight (2016), underneath the argument of the research-teaching nexus, one of the underlying debates is about the ideas and the ultimate goals of universities. Therefore, while the concept of 'nexus' might come from the 1970s, the discussion about the roles of research, teaching and their relationships in universities has a long history.

In the western world, most scholars agree that the history of universities can be dated back to the 12th century (Ruegg, 1992; M'Gonigle & Starke, 2006; Axtell, 2016). Major cities such as Bologna, Paris, Montpellier and Rome saw the rise of universities across Europe. In the UK, English universities like Oxford and Cambridge and Scottish universities like St. Andrews and Glasgow were also amongst the earliest universities. With great religious attributes, early universities were more like communities, where scholars and students gathered spontaneously to teach and study ancient wisdom for fulfilling God's will. At that time, there were no campus or landmark buildings. A handful of scholars who mastered general knowledge were the backbones of the universities (Axtell, 2016). In an intensive collegiate atmosphere, the awareness of disciplines was weak. The knowledge being taught was usually termed 'universal knowledge' (Delanty, 1998, p. 6), which included theology, liberal arts, mathematics and astronomy etc. (M'Gonigle & Starke, 2006). As Lindsay and Neumann (1988, p.34) commented, the primary function of medieval universities was the 'preservation and transmission of knowledge'. Therefore, teaching was the dominating role. Nevertheless, Delanty (1998) suggested that research and teaching were inseparable in medieval times. This was because of the collegiate nature, that the professors taught what they wrote (i.e. researched).

The Humboldtian model and Newman's idea of a university: Rise of research and debate between research and teaching

In the late 18th century and early 19th century, the Humboldtian reform in German universities started a new era of the relationship between research and teaching in history. In the Humboldtian ideas, the rise of science brought a firm belief that research and teaching should be united (Lindsay and Neumann, 1988). As explained by Lindsay and Neumann (1988), the role of research became

increasingly important. Research was considered as dynamic and innovative activities, which would provide drivers of teaching activities. Echoed by Clark (1997) and Tight (2016), the Humboldtian universities conveyed the initial ideas of the research-teaching nexus, and were sometimes interpreted as a prototype of research-led institutions. Meanwhile, the specification of disciplines started to form. Along with different disciplinary characteristics and protocols, boundaries among the disciplinary were clearer (Lindsay and Neumann, 1988). Delanty (1998) illustrated that this period saw the transition from spontaneity to purposeful cultivation of higher education. With clear purposes of nurturing civil servants who could possess specific knowledge and skills, different disciplines started to have clear divisions.

The Humboldtian ideas had a great influence and became widely accepted by many universities in Europe and in the United States. This era was usually regarded as the beginning of modern universities (Lindsay and Neumann, 1988). While being impacted, however, the UK universities accepted the Humboldtian concepts relatively slowly. In England, Cardinal Newman (1907) insisted that teaching should remain the central position in universities as it was in the collegiate culture. Newman suggested research be separated from teaching, and undertaken outside the universities in specialist institutions (Tight, 2016). Meanwhile, as cited in Lindsay and Neumann (1988), Newman also acknowledged the importance of research from his experiences at the Catholic University in Dublin.

Contemporary movement: The concept of 'nexus'

Entering the 20th century, especially after the two world wars, rapid and considerable changes in the global economic and social environment had brought new prospects for universities. In an era when higher education turned from elite education to mass education, Kerr's (1963) idea of multiversity effectively illustrated the increasing functions of universities derived from developing social needs. Besides research and teaching, service was also added to universities' visions. Universities played an increasingly important role in a wide range of aspects of society, and the meanings of research, teaching and their relationship became more complex and subtle. With growing attention on and debates over the relationship between research and teaching, the concept of the 'research-teaching nexus' was introduced.

As mentioned in Section 1.1.1, the word 'nexus' was adopted in the 1970s and has been extensively used by scholars ever since (e.g. Neumann, 1992, Clark, 1997, Buckley, 2011, Gerschwind and Brostrom, 2015; Tight, 2016). Tight (2016) suggested that the usage of 'nexus' usually implied the authors' beliefs in the existence of the bond between research and teaching. In the last few decades, various studies have explored theoretical constructions of the research-teaching nexus and practical

applications of the nexus. For example, in the specific higher education (HE) context of the UK, Griffiths (2004), Healey (2005) and Healey and Jenkins (2009) came up with different types of the nexus, which will be used as the theoretical framework of the current study. A further illustration of the nexus theoretical framework is presented in Section 2.5. Many other scholars including Coate et al. (2001), Buckley (2011), Watermeyer (2014), Hunt (2016), Duff and Marriott (2017) and Bage (2018) also investigated the research-teaching nexus from different aspects. In spite of the heated discussion, it seemed that more questions than conclusions were unveiled regarding the research-teaching nexus topic. The debates over the research-teaching nexus are presented in Section 2.4 in detail. Meanwhile, the main focus of the nexus studies was on academics for a long time, and sometimes the perspectives of university managers and policymakers were investigated. Studies from the student perspectives were rarely seen until the growing trend of a shifted focus in very recent years (Brew, 2016). However, student voices are still under-represented.

2.3.2 Historical development of higher education institutions and the research-teaching nexus in China

The imperial China: The domination of Confucianism

As an ancient civilisation, China's higher education development is also rich in history. Scholars including Shu (2006), Xiao and Li (2014) and Lan and Liu (2017) summarised the historical evolution of higher education until the establishment of the People's Republic of China in 1949. In China, the earliest higher education institutions can be dated back to 1000 BC, which were primarily for the nobility to learn etiquette, practice religious rituals and promote emperors' ideas. In the Han Dynasty (about 124 BC), the Emperor established Taixue (Imperial College) in its capital city as the national highest educational institution. Taixue was considered the earliest official university in ancient China because it is established for knowledge transmission and development, although its primary purpose was still to train bureaucrats who could help the Emperor rule people. Initially, the number of students enrolled in Taixue was only 50, taught by a handful of professors who were specialised in five classic Confucian books respectively. Whilst the Confucian books were the only subjects taught in Taixue, the content of the books covered a wide range of topics. For example, the relationship between nature and humans, the code of conduct between different groups of people, history and so on. Students were expected to learn how to be noble and wise men, how to behave appropriately with different roles in life, and ultimately how to help the Emperor manage the country. Gradually, the subjects slightly expanded with more Confucian books added. The number of students also rapidly increased. After reaching a peak at about 30,000 at the end of the Han Dynasty, the number decreased to around 5,000 in later dynasties.

The same as western universities in medieval times, teaching was the sole fundamental task in Taixue. The main form of teaching was lectures given by the professors. There were discussions with the professors and peer discussions about the learning content, while the professors held absolute authority.

In the Jin Dynasty (about AD 278), Guozixue was established by the Emperor as an additional higher education institution besides Taixue. Although it had similar operations to Taixue, Guozixue only accepted students from upper-class families with certain official positions in government. This segregated students from different social classes, and actually negatively affected the development of Taixue. In the following 300 years, both Guozixue and Taixue experienced a turbulent time under the unstable political environment and frequent regime substitutions. Until the Sui Dynasty and the Tang Dynasty (around AD 600), the stabilised political environment and increased economic conditions allowed steady development of the education system. At that time, Guozixue was renamed as Guozijian, which served as both the highest education institution and the highest education administration institution. Guozixue and Taixue became parts of Guozijian, together with other four departments. Noticeably, in addition to the Confucian classics, laws and mathematics had been included in the learning subjects at Guozijian. The length of study at Guozijian was not fixed, but depended on the examination results which indicated whether students had acquired all the necessary knowledge.

Decided by its dual roles, the functions of Guozijian included both teaching and administration. Teaching was still aimed at training and selecting bureaucrats. Administration, including holding the Imperial Examination (Keju) as the national qualification test for becoming bureaucrats, was aimed at assisting the Emperor in managing and monitoring the bureaucrats as well as policy makings.

Whilst the notion of 'research' did not explicitly exist in ancient China, the ethos of research and even the research-teaching nexus was embedded in Confucianism and the philosophy of 'knowledge-practice oneness' by Yangming Wang, a philosopher in the Song Dynasty (around AD 1500) (Chen, 2018). As explained by Chen (2018), both Confucius and Yangming Wang highlighted the importance of congruence among knowledge, learning, and practice. In other words, the teaching function emphasised at Taixue or Guozijian was mainly for the ruling purposes of the Emperor, whereas the philosophies of Confucianism and Yangming Wang indicated more inclusive values.

The modern China (1840-1949): The introduction of the western education ideas

Guozijian had existed for more than 1200 years until its termination in 1905. Around the late 19th century and the beginning of the 20th century, China's higher education system started the journey of modernisation and westernisation. After defeats in the wars against the UK and Japan, the Qing Empire and later the government of the Republic of China (starting in 1912) started a series of reforms to study the western patterns for strengthening the country's power, including the adoption of the Humboldtian ideas. As summarised by Liu and Xu (2004), Pan and Wang (2013), Hou and Wen (2018), and Wang (2021), the main characteristics of higher education reforms are as follows. First, Daxue (universities), the earliest modern universities such as Peking University, Tsinghua University and Tongji University were established following the Japanese and western (mainly German and American) models. The length of study was fixed as four years.

Second, various disciplines were developed and differentiated. A much wider range of disciplines, including many modern subjects originating from western societies such as Economics, Engineering and Chemistry, was established. There were debates arguing whether modern universities should develop students as specialists specialised in certain disciplines, or as generalists mastering a variety of disciplinary knowledge. Most influential educationalists supported the idea that universities should first equip students with basic knowledge and skills across different disciplines, and then encourage students to pursue a deeper understanding of specific disciplinary knowledge. Thus, there were many comprehensive universities at that time.

Third, education independence and academic autonomy were highly advocated. Universities were suggested to be managed by academics and educationalists. Respect for different academic opinions was advocated. The goal of student education was no longer solely for developing governors (as means), but more for the students to improve and fulfil themselves (as ends). Upon graduation, students had different pathways besides becoming government officials. This was a significant change compared to the imperial times when higher education was extremely politically related.

Fourth, the concept of research was introduced. The Humboldtian idea of linking research and teaching was also imported at early Chinese universities. It can be seen that in comparison with the long history of HEI development, the research function of universities started quite late in China. Teaching still took the leading role over research in universities.

The contemporary China: Growing strengths with unique Chinese characteristics

Since the foundation of the People's Republic of China in 1949, the development of higher education experienced several periods with both achievements and setbacks along with considerable changes in the political, economic and social environment (Ouyang, 2004). The relationship between research and teaching also changed in different periods. In the early 1950s, the complete introduction of the former Soviet Union model largely changed the universities. For example, there was a sharp decrease in the number of comprehensive universities and in the programmes of humanities and social sciences. The number of universities and colleges focusing on specific applied subjects such as polytechnics, agriculture and Marxist economics considerably increased. This corresponded with the urgent need of developing the planning economy and reconstructing the national strengths after the wars. Under the Soviet Union model, the country (the government) was responsible for the study cost and employment of the students. Teaching and research were separated, and the role of teaching predominated in universities.

Between the late 1950s and early 1960s, China attempted to explore a unique HE development pathway of its own and abandoned the Soviet Union model. However, an unrealistic strategy was decided which resulted in rapid inflation in the number of universities and colleges, at the price of education quality (Ouyang, 2004; Li, 2015). The mistake was corrected soon largely through mergers among universities. In this period, as Ma (2017) pointed out, the central government tried to end the separation between teaching and research and re-install their important connection. The establishment of the University of Science and Technology of China announced both research and teaching as the fundamental tasks of modern universities in China. The progress of the HE development paused in 1966 when the ten-year Cultural Revolution started. The event brought devastating impacts on the whole education system of the nation as '*all formal education in China was stopped*' (Ouyang, 2004, p. 142). The National College Entrance Examination (NCEE) was abolished. Academics were heavily criticised and even abused. Farmers, workers and soldiers took over the universities. Rather than generating and disseminating knowledge, the universities actually became propaganda places which had little to do with teaching and research.

After the Cultural Revolution ended, the NCEE recovered in 1977. The reconstruction of the higher education system started to take place, and there was relatively slow but steady development in the HE sector in the following 20 years. As Ouyang (2004), Li (2015) and Liu (2017) introduced, major achievements included re-installing the degree system which was in parallel with the western universities. The number of universities and colleges reasonably increased to about 1000 by 1998. Various disciplines were established and developed. Both research and teaching were widely

recognised as important tasks of universities. There were initial classifications of different types of universities, such as research-intensive universities and more teaching-intensive colleges. Usually, the research-intensive universities were comprehensive universities which received more resources and policy support. They were generally better universities as well. The teaching-intensive colleges tended to focus on a certain disciplinary area, providing hands-on knowledge and practical skills for students to easily apply at work. Nevertheless, by 1998 higher education in China still belonged to a small group of people because of the limited number of universities and the low acceptance rate in the NCEE.

Since 1998, the new higher education reforms have greatly boosted HE development and formed the shape of today's HE sector in China. A series of actions marked the start of massification, marketisation and globalisation of the Chinese HE (Ouyang, 2004; Li, 2015). For example, there was a great expansion of university enrolment starting in 1999. The state no longer paid for the tuition fees or allocated jobs upon graduation. Instead, students were responsible for their own education bills and employment. Universities started to join in the global context and compete with universities from other countries, with great policy and financial support from the central government. As introduced in Section 1.1.2, the launches of Project 211, 985, and Double First Class universities and disciplines marked the ambitions as well as a significant development of the Chinese HE sector. While the HEIs in China achieved remarkable progression, the relationship between research and teaching also changed. Related research-teaching nexus studies are presented in the following Section 2.4

2.4 Understanding the research-teaching nexus

2.4.1 The nature of the research-teaching nexus

As Mayhew (1973, p.29) put it, *'The relationship between research and teaching is such a myth-laden subject that precise and broadly accepted generalisation is almost impossible to make.'* The complex and subtle nature of the research-teaching nexus has brought much debate in academia. From studies across the world in recent decades, various evidence has demonstrated that research and teaching can be mutually reinforcing, competing, or unrelated.

Considered as 'conventional wisdom', teaching and research are considered to be firmly connected and positively related (Li, McCormick and Barnett, 2015, p. 585). For example, Neumann (1992) and Rowland (1996) investigated the perspectives of senior academic heads on the research-teaching nexus in Australia and the UK respectively. They found that the nexus is undoubtedly believed to

exist, and a stronger link will allow the two activities to boost each other. That is to say, active researchers make better lecturers and the same applies vice versa. Specifically, Neumann (1992) summarised the tangible and intangible connections between research and teaching. The former connection was about *'the transmission of the advanced knowledge'* (p. 162), and the latter included motivating students to develop an interest in and establish a positive attitude towards research in teaching, as well as forming a research-intensive atmosphere for both academics and students. This idea of the bond between research and teaching is also in line with the classic Humboldtian conception of higher education institutions, where research and teaching are entwined (Jenkins and Healey, 2016). Other evidence from some recent studies has also echoed this conventional belief. For example, Zhang and Shin (2015) indicated teaching styles and publications of university academics are positively related in Beijing, China. Magi and Beerken (2015) suggested that research-active academics are more likely to provide higher teaching quality with the integration of frontier research into classroom teaching.

Contrastingly, a negative or competing relationship between teaching and research is also reported. As Coate et al. (2001) demonstrated, in the UK the scarcity of resources usually leads to the two tasks being in conflict, and research can negatively impact the quality of teaching. Similarly, Shin (2011) indicated that academics who publish more articles in international journals appear to receive lower student evaluation scores in teaching at a South Korean university. Concerns have been widely expressed about research taking a dominant role over teaching at the price of compromised teaching effort and quality (e.g. Bak and Kim, 2015; Li et al., 2015; Chen, 2015). Meanwhile, based on evidence from two studies looking into academics' perspectives in China, Hu et al. (2014) and Hu et al. (2019) concluded that there might be gaps between academic beliefs and their practice of the research-teaching nexus. Although the academics valued and intended to integrate research into teaching, the integration was difficult to realise. In addition to limited time and effort, the nexus practice was also constrained by the rigid curriculum and lack of student interest or responses.

In addition, Hattie and Marsh's influential meta-analytic review in 1996 indicated that there was little or zero correlation between research and teaching. Hattie and Marsh (1996) investigated nearly 500 correlations of the relationship between teaching and research at individual and departmental levels from 58 studies, and variables included time investment in research and teaching, research productivity, teaching quality, staff commitment, personalities and abilities and rewarding systems and so on. A slightly positive weighted average ($r=.06$) and little variance *'anywhere between research and teaching'* (p. 525) was spotted. They concluded that research and

teaching quality are not necessarily inter-connected, especially in particular disciplines such as natural science and at research-intensive universities. The scholars suggested three possible reasons for the results. First, research and teaching do not have many underlying common traits because they are different entities. Second, research and teaching require different and often unrelated personalities. Third, the funding schemes tend to separate research and teaching since independent funding resources are preferred. As Hattie and Marsh reaffirm in 2004, the near-zero relationship between teaching and research does not mean that there are no good researchers and good teachers at the same time. It also does not imply that government funding for teaching and research should be separated merely because of the near-zero relationship. Policies can be made upon any kind of relationship between teaching and research. More importantly, specific policies reflect what is the desired nexus (Hattie and Marsh, 2004).

In comparison with the extensive research-teaching nexus studies in the western context, related studies in the Chinese context are more likely to be a theoretical discussion (e.g. Zhang, 2006; Ge, 2007; Xu, Qin and Yao, 2014; Liu, 2017), in which concerns are usually expressed regarding the overemphasis on research at the expense of decreasing teaching quality. Only a handful of nexus studies in China provide empirical evidence, such as the studies mentioned earlier by Hu et al. (2014), Li et al. (2015), Zhang and Shin (2015) and Hu et al. (2019). All of these studies have focused on the academic perspective, mainly on academic beliefs of the research-teaching nexus (including country comparisons) and the relationships between teaching styles and research output.

2.4.2 Disciplinary differences of the research-teaching nexus

It is important to notice that the complexity of the research-teaching nexus also comes from its distinctive appearances across various disciplines. As Biglan (1973) and Becher (1987) explained that because of the distinguishing nature of knowledge, different disciplines would shape different research cultures and ways of practice. For example, 'hard' disciplines such as biology, mathematics and engineering, and 'soft' disciplines such as linguistics, education and arts would be very different in terms of conducting research and teaching (Biglan, 1973). Meanwhile, the structure of the faculties or departments usually varied across disciplines, because the professional liaisons among researchers were different (Jenkins, 2004). These particular disciplinary characteristics also influence how researchers view research and its relationship with teaching. Empirical evidence is shown to support this idea. For example, both Colbeck (1998) and Robertson and Blackler (2006) looked into the disciplines of Physics and English for comparisons. While the former scholar investigated from the perspective of academics and the latter focused on students, both of them reported different understandings of research and the research-teaching nexus across disciplines. From the academic

perspective, Physics academics mentioned student involvement in staff research was considered a common way of research-teaching integration, and many inquiry-based activities were conducted. Contrastingly, English academics tended to consider research more equivalent to scholarship, and the research-teaching nexus was more likely to be found in the curriculum design. From the student perspective, Physics research looked like lab-based discoveries at a higher level, while English research was concerned with literature in the library. Additionally, Robertson and Blackler (2006) also compared Geography students' perceptions of research and in-field practice was highlighted, which was different from the perceptions of students who studied Physics and English. Not at odds, as presented in Section 2.7, Jenkins et al. (1998), Robertson and Bond (2001) and Verburch and Elen (2011) demonstrated the disciplinary differences in the research-teaching nexus as well. Many scholars (e.g. Rowland, 1996; Griffiths, 2004; Robertson, 2007; Yu, Fu and Zhou, 2010) have suggested that the understanding of the research-teaching nexus should be discipline-contextualised.

2.5 Healey's (2005) nexus theoretical framework

Amongst the theoretical frameworks which analyse the research-teaching nexus, the ones developed by Griffiths (2004) and Healey (2005) have been widely recognised and applied.

Based on the three-year LINK project in built environment subjects across four universities in England, which was funded by the Higher Education Funding Council for England and Wales (HEFCE), Griffiths (2004) investigated the process of knowledge production and the research-teaching nexus through three phases. The first phase consisted of focus group meetings with staff from participating universities. The second phase included conferences, workshop presentations and inquiry submissions mainly within the built environment disciplines at the national level. In the third phase, an international conference was held with the intention of dissemination beyond the disciplinary boundaries, and similar projects were initiated across different disciplines in the four LINK project universities.

Griffiths (2004) summarised three main characteristics of the relationship between research and teaching. First, the features of the research-teaching relationship can be either '*specific*' or '*diffuse*' (p. 721, emphasis in original), and the latter form tends to be more common. Second, research can be either '*weakly embedded*' in or more '*strongly integrated*' with teaching (p. 721, emphasis in original), and this will make a difference in the interactions between the lecturers and students. Third, the influence between research and teaching can be either largely '*unidirectional*' or '*two-way*' (p. 721, emphasis in original). While the influence of research on teaching was more frequently

referred to, Griffiths (2004) pointed out the positive impacts of teaching on research should not be neglected.

Guided by these characteristics, Griffiths (2004) suggested a four-type model of the research-teaching nexus. First, Research-led Teaching follows a more traditional way of instilling research findings. Lecturers' specific research interests will directly decide the content of the knowledge transmission in class, and little attention is paid to the research processes. The two-way influence between research and teaching is not deliberately explored.

Second, Research-oriented Teaching highlights student understanding of the research processes and the possession of inquiry skills. In other words, students are expected to understand research methods and how to carry out research (Zhu and Pan, 2017). Compared to Research-led Teaching, lecturers' personal research experiences will be integrated into teaching in a more diffuse way in Research-oriented Teaching.

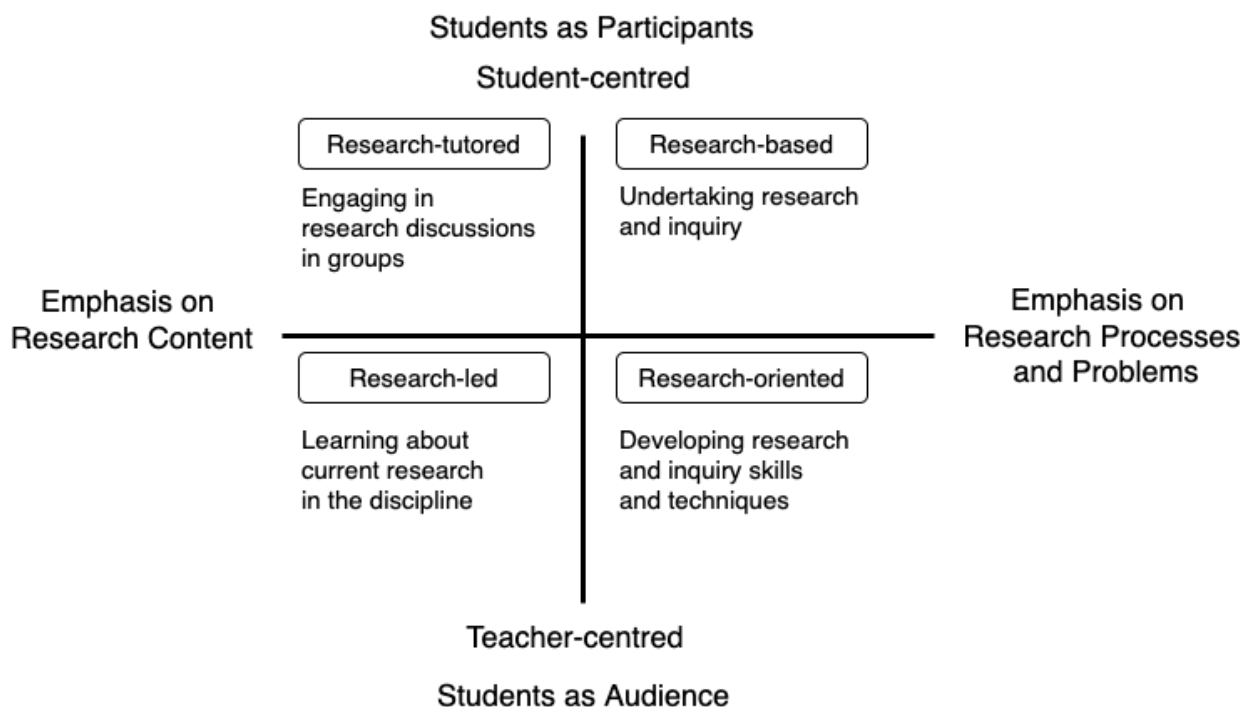
Third, Research-based Teaching focuses on inquiry-based and problem-based activities, and it is practised intentionally for developing a mutually reinforcing relationship between research and teaching. In this approach, research plays an important role in curriculum design and students are encouraged to learn like researchers. While students are more actively engaged in the inquiry processes, academics can also learn through teaching activities.

The fourth type suggested by Griffiths (2004) is Research-informed Teaching, which is concerned with integrating the essence of research, which is '*systematic inquiry*' (p.722), into the teaching and learning processes. Nevertheless, Griffiths (2004) did not provide concrete and detailed explanations of this type. As understood by the researcher, in comparison with the other three nexus types, which tend to focus on the research-teaching integration at the micro-level from specific aspects, Research-informed Teaching displays an integration between research and teaching at the holistic and systematic level. While Research-informed Teaching provides an insightful concept of the research-teaching nexus, it can hardly be operationalised in practice because of the absence of specific indicators.

Built upon Griffiths' (2004) model, Healey (2005) came up with four quadrants of the research-teaching nexus incorporating the three dimensions of curriculum design: emphasis on research content or processes, student passive participation or active engagement, and teacher-centred or student-centred teaching. As illustrated in Figure 2.1, each quadrant represents one type of the nexus. Research-led Teaching, Research-based Teaching and Research-oriented Teaching are matched in concepts with the corresponding types by Griffiths' (2004). Particularly, Healey (2005)

specified Research-tutored Teaching as the fourth nexus type, highlighting student-centred teaching, student participation, and research content. For example, in Research-tutored Teaching, students will learn about research findings through group discussions with lecturers' facilitation. As cited by Healey (2005), Gibbs (2004) suggested that 'tutoring' was considered different from 'teaching', because the purposes of 'tutoring in tutorials' were different from those of 'teaching in lectures'. Student learning would be negatively affected if 'tutorials' were used for 'teaching'. Healey and Jenkins (2009) emphasised that pedagogical activities were likely to display features from different nexus types at the same time. The scholars also indicated that an appropriate combination of different nexus types could be more effective in promoting student learning.

Figure 2.1 Healey's (2005) nexus-type framework



The current study employs the nexus theoretical framework by Healey (2005) because it explicitly presents the distinctive characteristics of the different types of integration between research and teaching. The nexus-type clarification based on the different dimensions of curriculum design provides useful guidance on operationalising the nexuses in practice, which contributes to understanding and enhancing the nexuses. In addition, both Griffiths' (2004) and Healey's (2005) models are developed based on studies focusing on universities in the UK. To a certain degree, the chosen theoretical model is more context-specific.

There are also critics of the nexus framework. While many scholars are aware that there are different types of research-teaching integration, the specific labels of the types are usually used inconsistently or interchangeably in practice and in publications. For example, Bottcher and Thiel (2018) used the term 'Research-oriented Teaching' to indicate all related opportunities provided to develop students' research competencies. Harris and Tweed (2010) introduced a Research-led Teaching approach as student-centred rather than teacher-centred. Nicholson (2017) and Higher Education Academy (2017) considered 'Research-informed Teaching' as the general term for all the different nexus types. Moreover, concepts including 'inquiry-based teaching', 'research-informed pedagogy' and 'problem-based learning' are also used by scholars (e.g. Coetzer and Sitlington, 2014; Bubou, Offor & Bappa, 2017; Chan, 2017) to indicate the broad idea of Research-informed Teaching. To avoid confusion, the current study identifies and interprets the nexus types with the definitions from the framework by Healey (2005).

Healey's (2005) nexus framework illustrates the research-teaching nexus with static and 'categorical' quadrants. Nevertheless, as Clark and Hordosy (2019) indicated, the nexus tended to be dynamic and affective. There were 'ordinal' phases of nexus development, from general assimilation to in-depth research engagement gradually. Thus, the nexus dynamics cannot be presented from Healey's (2005) framework.

Meanwhile, the framework was originally developed from the perspective of academics. Several student-focused nexus studies had referred to Healey's (2005) framework (e.g. Spronken-Smith, Miroso and Darrou, 2014; Abdel Latif, 2019; Osnes and Skaug, 2019), whereas direct operationalisation of student perceptions and experiences of the various nexus types was rarely discovered (e.g. Ball and Mohamed, 2010). More empirical evidence of student nexus-type experiences would help further demonstrate the applicability of the nexus framework.

2.6 Empirical studies applying the research-teaching nexus frameworks by Healey (2005)

A number of empirical studies have employed Healey's (2005) theoretical framework to examine the different types of nexus in practice across various disciplines. Most of these studies looked into different aspects of pedagogical design and practice. Generally, positive feedback and promising prospects of integrating research into teaching in different types are indicated. It is still worth remembering that the research-teaching nexus is complex, and mixed characteristics of different nexus types can be seen in one empirical project (Griffiths, 2004; Healey, 2005; Brew, 2006).

Contextualised attributes, including but not limited to disciplinary characteristics, organisational (departments, faculties, and universities) environment, as well as overall higher education, cultural, and national background, need to be carefully considered in understanding and applying the nexus-type theory in practice.

2.6.1 Research-led Teaching

In Healey's (2005) framework, Research-led Teaching seems to be the most traditional or simplest approach of integrating research into teaching. It still has a teacher-centred focus, and students have relatively superficial and limited involvement in research. Nevertheless, this approach is easier to practice for universities and lecturers who have just started their efforts in establishing the research-teaching nexus. It can be also very helpful in specific disciplines or subjects.

Yuen (2017) presented a Computer Science module in Singapore with a Research-led Teaching design, in which lecturers' knowledge about research was integrated into the module design. In this module, the achievement of learning outcomes and degree of student satisfaction were both encouraging. Haaker and Morgan-Brett (2017) demonstrated how they developed two teaching modules based on their own research projects with data reuse in the UK. In these research methods modules, students were able to access real data from different research projects in the database. In the process, students learned about what research projects were like and knowledge related to different research methods. They also gained awareness of research ethics issues like confidentiality. While the scholars introduced their pedagogical approach as Healey's (2005) Research-led Teaching, the teaching activities displayed features from both Research-led Teaching and Research-oriented Teaching.

From the perspectives of academics and university managers, Mitchell and Harvey (2018) explored the possibility and preference of improving research impact dissemination via Research-led Teaching or Research-tutored approaches. They concluded that in the field of business management, Research-led Teaching could help disseminate academics' research production via student experiences. At the faculty and university levels, the selection of research projects and resource support to integrate research into teaching were important.

2.6.2 Research-oriented Teaching

Highlighting students' understanding of research processes and methods, Research-oriented Teaching at the undergraduate level has been explored by scholars from different countries and

disciplines. Workshops, project-related tasks and extensive VLE-supported individualised consultation were conducted in applying the Research-oriented Teaching type.

Leston-Bandeira (2013) illustrated a case study of Politics students learning research methods through the Research-oriented Teaching approach in the UK. Preparations for research projects, different research methods, data collection and data analysis were taught in the module. At a Double First Class university in China, Hei, Liu and Cheng (2013) investigated a Research-oriented Teaching curriculum designed for international students who majored in telecommunication engineering. Student projects were based on real-world problems, and an understanding of the whole problem-solving process was required. Similarly, Petit, Sahuquillo, Gomez, and Selfa (2017) interpreted a Research-oriented Teaching module designed for undergraduate Architecture students in Spain. Research article discussion, lab-based and exercise-based activities, as well as presenting research articles were incorporated. In India, Kumar (2017) implemented Research-oriented Teaching in multiple undergraduate computer science modules with embedded research ethos in the curriculum design.

In general, the above studies received very positive outcomes and feedback. The involved undergraduate students had developed increased awareness and motivation in participating in research activities. In the meantime, they acquired basic research skills which would be beneficial to their future study or employment (Hei et al., 2013; Leston-Bandeira, 2013; Kumar, 2017; Petit et al., 2017). In the studies of Leston-Bandeira (2013) and Kumar (2017), Research-oriented Teaching also helped improve students' assessment results. As summarised by the scholars above, the selection of projects was vital in practising the Research-oriented Teaching approach. For example, projects with appropriate difficulty levels and close relevance to real-world problems can help motivate students to actively participate (Hei et al., 2013; Leston-Bandeira, 2013; Petit et al., 2017). Advanced technologies can be auxiliary tools to support the Research-oriented Teaching practice, such as information systems (Hei et al., 2013) and VLEs (Leston-Bandeira, 2013). In addition, the studies of Hei et al. (2013) and Petit et al. (2017) showed hybridised features of Research-oriented Teaching and Research-based Teaching, and Kumar's (2017) study combined Research-oriented Teaching and Research-tutored Teaching.

2.6.3 Research-based Teaching

With a highlight on inquiry-based activities and problem-based learning, the Research-based Teaching type is aimed at deliberately enhancing the two-way interaction between research and teaching activities. The case study presented by Willcoxson, Manning, Johnston and Gething (2011)

introduced a successful Research-based Teaching implementation in business research methods modules for undergraduate students in Australia. The problem-based learning embedded course design did not only improve the student assessment results and module evaluation results, but also increased the amount of research and teaching grants for the lecturers. It was a positive example demonstrating how research and teaching mutually supported and enhanced each other.

In the UK context, a range of scholars undertook different approaches to implement Research-based Teaching across disciplines. For example, Pan, Murray & Cotton (2011), Gresty and Edwards-Jones (2012), Higgins, Hogg & Robinson (2016), and Byrne, Rossi & Doolan (2017) looked into the subjects of environmental building, science, diagnostic radiography, and computer science respectively.

Pan et al. (2011) followed a qualitative approach to reveal the drivers, barriers and strategies of implementing Research-based Teaching at a post-1992 university. Individual interviews were carried out with academics and recent graduates, and focus group interviews were conducted with final-year undergraduate students. Higgins et al. (2016) adopted a quantitative approach, in which they conducted an online questionnaire-based survey with Year 2 undergraduate students at the University of Salford. The purpose was to explain students' learning experiences and learning outcomes of participating in a Research-based Teaching activity. Gresty and Edwards-Jones (2012) employed a mixed methods design. To examine the process and influence of developing an undergraduate e-journal, the scholars conducted an online questionnaire-based survey with 161 science undergraduate students across Year 1 to Year 3, and had semi-structured interviews with 14 recently graduated students. Byrne et al. (2017) shared classroom experiences with Year 2 undergraduate students. Student feedback and programme committee meeting discussions were taken into account to analyse the effect of a robot-assisted module at the University of Hertfordshire.

Consistently, all the researchers above reported Research-based Teaching as a helpful approach to link research with teaching in practice. For example, Research-based Teaching helped enhance course learning experiences and outcomes. Students gained a better comprehension of the course content (Higgins et al., 2016). Students improved their understanding and ability to solve real-world problems, and thus improved their employability (Pan et al., 2011). Additionally, compared to traditional classroom teaching, Research-based Teaching was able to provide more opportunities for undertaking research activities for undergraduate students or post-graduate taught programme students, who were often marginalised in research activities. These opportunities helped develop student interest in research and essential research skills (Gresty and Edwards-Jones, 2012).

Nevertheless, challenges were also spotted in designing and implementing Research-based Teaching activities. For example, studies showed that some Research-based Teaching tended to heavily rely on lecturers' quality and skills (Pan et al., 2011; Gresty and Edwards-Jones, 2012). Particularly, Gresty and Edwards-Jones (2012) warned that the reliance on lecturers' or tutors' current research projects was likely to turn Research-based Teaching into the teacher-centred Research-led Teaching approach. Large class sizes and gaps in student capabilities could also affect the effectiveness of Research-based Teaching practice.

2.6.4 Research-tutored Teaching

As Healey (2005) suggested, the Research-tutored Teaching type underlines active student participation in research group discussion, and is likely to be employed together with other nexus types. A participant from the study by Van der Rijst et al. (2013), which was about the relationship between lecturers' goal statements and students' experiences of research in science coursework, introduced that he mainly adopted a Research-tutored Teaching approach. In the class, students would review literature in groups, and make presentations of journal articles in front of peers and the lecturer. Further discussion was encouraged. While the students did not participate in empirical studies, they reported awareness of recent research and motivation to engage in research.

Mitchell and Harvey (2018) described their experiences of combining Research-tutored Teaching and Research-led Teaching in exploring how to improve the impact of management research. As introduced earlier in Section 2.6.2, in the computer science module design, Kumar (2017) integrated research into teaching following a combined approach of Research-tutored Teaching and Research-oriented Teaching.

2.7 Studies that operationalise the research-teaching nexus from the student perspective

In previous studies, academics' perceptions and beliefs of the research-teaching nexus have been extensively investigated. Studies that operationalise student awareness and experiences of the nexus are much fewer in number. Usually, student perceptions and attitudes are assessed based on experiences recorded on standard module feedback forms (e.g. Shin, 2011; Willcoxson et al., 2011; Byrne et al., 2017). Nevertheless, the design of student module feedback or evaluation forms tends to be simple and general. They cannot provide specific or in-depth information on student experiences or opinions about the research-teaching nexus across disciplines. As summarised in

Table 2.1, this section highlights the studies that provide intentional and context-specific operationalisations of the student perceptions, experiences and attitudes towards the research-teaching nexus.

Table 2.1 Studies operationalising student perceptions, experiences and attitudes towards the research-teaching nexus

Studies	Locations and disciplines	University types	Research methods	Participants
Neumann (1994)	Australia Multiple disciplines	Not specified	Interviews	28 UG and PhD students
Jenkins et .al (1998)	UK Eight disciplines	Less research-intensive	Semi-structured focus group interviews	Year 1 and Year 3 UG students
Breen and Lindsay (1999)	UK Multiple disciplines	Less research-intensive	Paper-based questionnaire (71 Likert-scale items)	100 Year 3 UG students
Lindsay et al. (2002)	UK Eight disciplines	Less research-intensive	Semi-structured focus group interviews	UG and PGT students
Zamorski* (2002)	UK Multiple disciplines	Research-intensive	Interviews, journals and image commentaries	12 Final-year UG students as researchers and 16 academics
Robertson and Blackler (2006)	New Zealand Three disciplines	Research-intensive	Semi-structured individual and small focus group interviews	34 students (24 UG, 1 master, 9 PhD)

Verburgh et al. (2007)	Belgium Chemistry and biochemistry	Research-intensive (small-scale)	Questionnaire administered in class	38 Year 1 UG students
Turner et al. (2008)	UK and Canada Multiple disciplines	2 Research-intensive and 1 less research-intensive	Online and paper-based questionnaire (different types of items)	515 UG students
Ball and Mohamed (2010)	UK Hospitality management	Less research-intensive	Questionnaire (28 Likert-scale items)	73 final-year UG students
Healey et al. (2010)	UK Multiple disciplines	Less research-intensive	Sequential mixed methods with two stages: 1. Online questionnaire (different types of items) 2. Five small focus group interviews	Questionnaire: 163 UG students and 31 PG students Focus Group: 15 UG students and 3 PG students
Buckley* (2011)	UK Sports	A mix of research-intensive and teaching-led universities	Semi-structure interviews	14 Year 3 UG students and 7 lecturers
Jusoh and Abidin (2012)	Malaysia Accounting	Research-intensive	Questionnaire (different types of items)	480 final-year UG students
Van der Rijst* et al. (2013)	The Netherlands Science	Research-intensive	Pre-course: Semi-structured interviews with lecturers	104 UG students and 10 lecturers

			After course: Questionnaire with students (35 Likert-scale items)	
Spronken-Smith et al. (2014)	New Zealand Multiple disciplines	Research-intensive	Questionnaire (the same instrument with Turner et al. (2008))	1281 UG students
Fuller et al. (2014)	UK and New Zealand Geography	Not specified	Questionnaire (36 Likert-scale items with additional open comments allowed)	194 UG students
Visser-Wijnveen et al. (2016)	The Netherlands Three disciplines	Research-intensive	Questionnaire administered in class (40 Likert- scale items)	221 UG students
Vereijken et al. (2018)	The Netherlands; Medicine	Research-intensive	Paper-based questionnaire (30 Likert-scale items)	261 Year 1 UG students
Abdel Latif (2019)	Saudi Arabia Computer-assisted language learning	Not specified	Action research	15 PG students
Clark and Hordosy (2019)	UK Multiple disciplines	Research-intensive	Longitudinal study: semi- structured interviews on a	40 UG students

			yearly basis for three years	
Osnes and Skaug (2019)	Norway Early childhood education	Less research-intensive	Online questionnaire (Item types not specified)	80 Year 1 UG students
Miulescu (2019)	Romania Educational Sciences	Research-intensive	Pre-experimental design (one group): pre-test and post-test questionnaire (40 Likert-scale items)	52 Year 2 UG students
Vereijken et al. (2020)	The Netherlands Medicine	Research-intensive	Longitudinal study: questionnaires on a yearly basis for three years	947 UG students
Griffioen (2020)	The Netherlands; Seven disciplines	Applied university	Online questionnaire (17 Likert-scale items)	2192 UG students

Note: The studies marked with * were conducted with both students and academic staff.

Responding to an earlier study focused on senior academics' perceptions of the research-teaching nexus (Neumann, 1992), Neumann (1994) investigated the student perspective at the same university in Australia. Based on interviews with 28 students, including a majority of undergraduates across different academic years and a small number of PhD students, Neumann (1994) suggested that students could perceive the same three levels of the research-teaching nexus as academics perceived, which were tangible, intangible, and global nexuses. The influencing factors related to the student perceptions of different nexus levels also shared in common with the factors revealed from

the academics. An additional influencing factor was revealed for student perception of the research-teaching nexus: the interactions between lecturers and students.

At Oxford Brookes University, a post-1992 university in the UK which claims to be relatively less research-intensive but more student-centred, a group of scholars conducted three studies to investigate student perceptions of integrating research into teaching (Jenkins et al., 1998; Breen and Lindsay, 1999; Lindsay et al., 2002). The first two studies focused on undergraduate students, and the third study involved both undergraduate and postgraduate students. The three studies adopted different research designs and research methods.

Both Jenkins et al. (1998) and Lindsay et al. (2002) conducted focus group interviews with students from the same eight disciplines, varying from humanities, social sciences to natural sciences, which were chosen based on different ratings in the 1992 RAE. In the former study, Year 1 and Year 3 undergraduate students were recruited and invited to talk about *'whether and how students experienced staff research as part of the curriculum in that discipline'* (p. 130). The finding suggested that regardless of discipline, the students' fundamental need in the universities was high-quality teaching. Research was considered positive, but as an optional or additional expectation from the participating students. Students perceived many benefits from the research-integrated teaching including improved knowledge understanding and motivation, as well as drawbacks including limited availability of lecturers and compromised teaching quality.

Lindsay et al. (2002) repeated Jenkins et al.'s (1998) study, and the participant groups were expanded to include both undergraduate students and taught master students. Compared to the previous study in 1998, the focus group interviews followed a more rigid facilitation schedule to allow quantitative comparisons between the UG and PGT groups. The findings reinforced the findings of Jenkins et al. (1998), that both undergraduates and postgraduates perceived advantages and disadvantages of staff research in relation to their study. Specifically, postgraduates highlighted that the integrated research content should be of interest to, relevant to, and useful for learning the curriculum knowledge.

Breen and Lindsay (1999) investigated the relationships between students' perceptions of lecturer research and motivation. Different from the aforementioned two studies, a quantitative approach was employed. 100 final-year undergraduate students took part in the questionnaire-based survey. The questionnaire had five sections and 71 items in total, which were all Likert-scale questions. Factor analyses were conducted and three factors were reported from the Principle Component Analysis by SPSS. The scholars concluded that intrinsic motivation and course competence were

related to students' positive perceptions of lecturers' research. Expectations of good marks and possible distraction of teaching related to students' negative perceptions of staff research activities.

At the University of East Anglia in the UK, Zamorski (2002) reported undergraduate understanding and experience with the research-teaching nexus. In the Research-led Teaching and Learning project, 12 final-year undergraduate students were recruited as student researchers and 16 academics were interviewed. The participating students were invited to conduct a series of qualitative research activities over two months. Their tasks included attending research workshops, interviewing fellow students and conducting initial data analysis, maintaining research diaries, conducting self-interviews about the perceptions and experiences of the research-integrated teaching, and taking photos to capture an 'image of research' in the university. The findings indicated that whilst students engaged with research in different ways, they might not necessarily realise their engagement or find the engagement helpful. For some students with a strong interest in research, insufficient opportunities to engage with research were discovered.

Robertson and Blackler (2006) adopted a qualitative approach to explore students' experiences of research at the University of Canterbury, a research-intensive university in New Zealand. Individual and small-scale focus group interviews (maximum three participants) were conducted with 34 students from the undergraduate, master and PhD levels. The participants were from disciplines including physics, geography and English. An experiential field analysis was conducted with the interview data. The findings showed divergent feelings and experiences among the participants across disciplines. Students from different subjects portrayed varied pictures of what was research and how was it integrated into teaching. The level of awareness of, and engagement with research among students also differed from low to relatively high. The visibility of research and opportunities available to be involved in research activities were part of the reasons that influenced students' perceptions.

Healey et al. (2010) adopted a mixed method approach to measure students' awareness, experiences and perceptions of research at the University of Gloucestershire, UK. This university is a relatively new university and less research-intensive. The study had two stages in data collection. First, an online questionnaire was distributed to a total of 2450 undergraduate and postgraduate students. 163 undergraduates and 31 postgraduates responded with a response rate of 8%. The respondents were mainly from Business School, School of Leisure, Tourism, Hospitality and Sport and other schools. The invitation was sent via email. The questionnaire contained a mix of Likert-scale questions, and open and closed questions, which comprehensively described students' awareness, experiences and feelings about different research activities at the university. In the

second stage, five small focus group interviews were conducted to explore a deeper and richer understanding of the topic. Each focus group had two to five participants, and 18 students participated in the discussion with 15 undergraduates and 3 postgraduates.

The results suggested that especially for undergraduate students, they were likely to gain awareness of lecturer research towards the later stages of their programmes of study, for example when they undertook dissertations. Similar to the findings of Jenkins et al. (1998) and Lindsay et al. (2002), students from the study by Healey et al. (2010) also reported perceived benefits of the research-teaching integration including acquiring up-to-date disciplinary knowledge and increased motivation, and perceived disadvantages from the research-teaching integration including decreased contact time with the lecturers.

The questionnaire used in Healey et al.'s (2010) study was clear, comprehensive and widely applicable. Some other scholars, such as Verburgh, Elen and Clays (2007), Turner, Wuetherick and Healey (2008), and Spronken-Smith et al. (2014), employed the same questionnaire to investigate student awareness and experiences of the research-teaching nexus in different contexts. Two studies were published earlier than Healey et al.'s (2010) study because the questionnaire was first developed in 2002 and presented at a conference in 2003.

Verburgh et al. (2007) applied Healey et al.'s (2010) questionnaire at the University of Leuven, a small-scale research-intensive university in Belgium. With 38 Year 1 chemistry undergraduate students participating, the sample size was relatively small. This study revealed that while the junior undergraduates had limited awareness of lecturer research and relatively neutral attitudes towards the research-teaching nexus, they considered it important that their lecturers actively engage with research.

Turner et al.'s (2008) study provided cross-institutional comparisons of student awareness, perceptions, and experiences of the research-teaching nexus, involving one research-intensive university in Canada, one research-intensive and one less research-intensive university in the UK. 515 undergraduate students participated in the survey. Besides descriptive data of each university, a crosstab Chi-square analysis was conducted to compare the differences among different universities. A variety of research experiences were reported at each university. Students from the two research-intensive universities demonstrated higher awareness of the research activities and significantly more impacts (both positive and negative) of research on learning. Additionally, regardless of the university type, many students expressed interest in integrating teaching and learning into their own research projects.

Also employing Healey et al.'s (2010) questionnaire, Spronken-Smith et al. (2014) conducted a survey of student awareness, experiences, and perceptions of the research culture at a research-intensive university in New Zealand. 1281 undergraduate students from a range of disciplines participated in the survey. Echoing Healey et al.'s (2010) findings, it was revealed that the student awareness of, and engagement with the research culture grew as they progressed through the academic years. Most undergraduates perceived benefits from research-integrated teaching, including an increased understanding of disciplinary knowledge, motivation, and research skills. Spronken-Smith et al. (2014) compared their findings in New Zealand to the findings of Turner et al. (2008) in the UK and Canada. While the final-year undergraduates in New Zealand displayed stronger awareness of, and more engagement with the research culture than their counterparts in the UK and Canada, the scholars raised the issue of insufficient opportunities for junior undergraduates to experience and engage with the research culture.

In the survey conducted by Ball and Mohamed (2010), 73 final-year undergraduate students studying hospitality management programmes at Sheffield Hallam University in the UK expressed their active attitudes towards the research-teaching integration. Particularly, as part of the questionnaire, Ball and Mohamed (2010) described the characteristics of each Healey's (2005) nexus type and asked the respondents to choose one most preferred type. Results showed that most students were in favour of Research-based Teaching and Research-tutored Teaching.

Buckley (2011) looked into both student and academic perceptions at the same time and focused on the Sports discipline across seven universities in the UK. The participating universities included both research-intensive and teaching-led universities. From each university, one senior academic staff and two final-year undergraduate students were recruited for interviews. Based on inductive thematic analysis, Buckley (2011) found that the participating students and the academic staff held different opinions about what was research, while they shared the idea that research and learning could be mutually complementary. Compared with academics' understanding that research was related to original scholarly work, which was similar to the definitions discussed in Section 2.2.1, students emphasised the aspects of personal inquiry and personal endeavours. From the student perspective, research opportunities largely came from learning and helping with lecturers' research. The findings also indicated that many students were willing to actively engage in research activities.

At Leiden University in the Netherlands, Van der Rijst et al. (2013) investigated the alignment between lecturers' goal statements and undergraduate students' experiences of research through coursework in the Science discipline. The study was conducted in two stages. Before the modules started, 10 science lecturers participated in semi-structured interviews and expressed their plans

and goals for teaching the modules. Then, 104 undergraduates who attended these modules responded to a paper-based questionnaire in the final sessions of the modules. The questionnaire asked about both tangible and intangible components of research that students perceived in the coursework. The qualitative data and quantitative data were triangulated in data analysis. The results suggested that student awareness and evaluation of the research-teaching integration could vary across modules with different nexus types. There were gaps between what lecturers intended to deliver and what students actually perceived about research disposition, especially about the intangible elements of research. Lecturers were encouraged to incorporate their own research projects into designing student research activities and explicitly communicate with students about what and how the research elements were integrated into teaching. Nevertheless, while Van der Rijst et al. (2013) referred to Healey's (2005) nexus-type framework, each module was labelled as one single nexus type based on lecturers' goal statements. This possibly explained some of the contradictory results found among the modules that were considered the same nexus type. As Healey and Jenkins (2009) reminded, one module might incorporate several nexus types.

In Malaysia, Jusoh and Abidin (2012) reported student awareness, experiences and perceptions of the research-teaching nexus based on a survey of 480 final-year undergraduates from accounting programmes at three universities (UiTM, UIA and UKM). The results revealed that undergraduate students' awareness of research activities undertaken at the university was slightly high, while their experiences of research participation and perceptions of academics' involvement in research were moderate.

Fuller, Mellor and Entwistle (2014) investigated geography undergraduate students' perceptions and evaluation of integrating academic research into student fieldwork at one university in the UK and one university in New Zealand. 194 students participated in the questionnaire-based survey and additional open comments were collected. In general, the students provided very positive feedback towards their fieldwork experiences based on academic research projects. The students considered such research-teaching integration as value-adding to their undergraduate study, helpful for understanding methodological issues in research, and motivational for their interest in the discipline. Slight negative opinions were heard mainly due to conflicting schedules between the fieldwork and exams.

Both Abdel Latif (2019) and Osnes and Skaug (2019) employed elements from all of Healey's (2005) four nexus types in course design and indicated student experiences and evaluation of the different ways of research-teaching integration. Abdel Latif (2019) focused on postgraduate students in a computer-assisted language learning course at an anonymous Saudi university. With an action

research design, classroom observation was conducted and a questionnaire with open-ended questions was distributed to the 15 postgraduate students who attended the course. Osnes and Skaug (2019) carried out an online questionnaire-based survey with 80 Year 1 early childhood education undergraduate students at a less research-intensive university in Norway (HiOA). In general, both studies suggested positive student feedback towards their experiences of the research-teaching integration including increased awareness and knowledge of disciplinary research methods. Abdel Latif (2019) noticed a small number of participants perceived negative experiences with their Research-based and Research-tutored activities, which was likely because of the higher demand for effort input.

At an anonymous Red Brick university in the UK, Clark and Hordosy (2019) conducted a longitudinal study to understand undergraduate experiences of the research-teaching nexus throughout their undergraduate student lifecycle. 40 undergraduate students from a range of disciplines participated in semi-structured interviews on a yearly basis for three years. Significantly, the scholars highlighted that the research-teaching nexus experience could be dynamic, active, and affective. The research-teaching nexus tended to develop in three phases, along with gradually narrowing focuses on disciplinary knowledge, closer relationships between the academics (researchers) and the students, more knowledge-generative involvement in research practice, and the increasingly discovering nature of independent learning. Furthermore, Clark and Hordosy (2019) suggested that student experiences of the research-teaching nexus were influenced by not only curricular pedagogical design, but also many other factors including factors from individual students and from the wider HE contexts.

Griffioen (2020) investigated the differences in student experiences of the research-teaching integration across different academic years and disciplines. An online survey involving 2192 undergraduate students across seven faculties at an applied university in the Netherlands was conducted. Based on the between-group analysis, the results suggested different patterns regarding various student research involvement across disciplines and study years. Specifically, when students from life disciplines (Biglan, 1973) engaged with the research-teaching integration as researchers, the perceived active involvement in research statistically significantly increased as they approached their senior academic years.

Employed as the questionnaire template of the current study, the Student Perception of Research Integration Questionnaire (SPRIQ) was originally developed and validated by Visser-Wijnveen et al. (2016) for investigating students' perceptions of the integration of research into teaching at a research-intensive university in the Netherlands. In the process of questionnaire development,

several rounds of studies were conducted. The initial item bank, which had 79 items, was built upon various scholars' frameworks and studies (e.g. Neumann, 1992; Marsh et al., 2002; Healey, 2010; Verburgh and Elen, 2011). Initial factor analyses were conducted based on the results of two small-scale pilot studies, which refined the questionnaire into 53 items. The updated questionnaire was distributed to 201 students in two departments across 24 courses. Followed by exploratory factor analyses, the authors further improved the questionnaire for the main study with 40 items (ten scales which contained four items each).

221 undergraduate students from three faculties (medicine, science and humanity) and five modules participated in the main study. With missing data eliminated, 208 responses were taken into data analysis. Exploratory factor analyses were carried out. Oblimin and Kaiser normalisation was applied due to the expected relatively high correlations between the factors. Cronbach's alpha test was also conducted to optimise the items. Both construct validity and content validity were examined by confirmatory factor analyses and ANOVA with Tukey B post hoc tests respectively. Then, the SPRIQ questionnaire was finalised to 24 items.

In their study, Visser-Wijnveen et al. (2016) utilised the following scales to demonstrate students' perceptions about the integration of research into teaching: research product, research process, academic disposition, integration in research community, current research, motivation for research, teachers' own research, students as participants, quality of the course and beliefs about research integration. They found that factors including motivation, reflection, participation and current research were correlated with students' positive perceptions and evaluation of research integration into teaching.

The co-developers of SPRIQ, Vereijken, Van der Rijst, Jan der Beaufort, Van Driel and Dekker (2018) and Vereijken, Van Der Rijst, Van Driel and Dekker (2020), applied SPRIQ in another two studies focusing on the discipline of medicine at Leiden University in the Netherlands. Vereijken et al. (2018) addressed the relationships between first-year undergraduate perceptions of research, academic performance, and beliefs about the value of research. The scholars adapted SPRIQ into 30 items (all five-point Likert-scale questions) with six scales, for the consideration of better fit for the specific Medicine discipline. 261 students responded to the questionnaire. The findings suggested that first-year medical students strongly believed in the importance of research-teaching integration in their current learning and future practice. Their beliefs of the value of research on learning were also related to their motivation for research. In addition, their familiarity with current research, motivation for research, and beliefs of the value of research on learning were related to their grades.

Involved with 947 medical undergraduate students, Vereijken et al. (2020) conducted a longitudinal study to investigate student perceptions of the research-teaching nexus throughout the undergraduate study. SPRIQ was completed on a yearly basis for three years. Comparisons were made between the previous curriculum and the changed curriculum, which deliberately incorporated more research practice. It was found that the students from the changed curriculum displayed increased awareness of research, participation in research and motivation for research.

Miulescu (2019) used an adapted SPRIQ to identify how educational sciences undergraduates at the University of Bucharest, a research-intensive university in Romania engaged with the research-teaching nexus in a module. With a one-group pre-experimental design, 52 Year 2 students participated in the study. Results suggested that student awareness of research and their involvement in research activities both increased. Meanwhile, the students perceived improved course quality and teacher involvement. Their interest in research and in the discipline was stimulated.

2.8 A synthesis of the student-focused research-teaching nexus studies

The student-focused research-teaching nexus studies introduced in the previous section have provided various pictures of student experiences and perceptions of the research-teaching nexus from a wide range of disciplines at different types of universities across the world. Despite each study demonstrating a unique story, several themes are extracted and synthesised with critical evaluation.

Modes of research-teaching integration in student experiences

In addition to Healey's (2005) nexus-type theoretical framework, several other conceptual models were constructed, such as Neumann's (1994) three levels of research-teaching nexus, Zamorski's (2002) five modes of research-teaching integration, and Clark and Hordosy's (2019) three nexus developing phases, all of which were derived from qualitative findings. From different angles, the conceptual models interpret what kinds of research-teaching integration are experienced by students, and provide theoretical guidance for later research. Some shared characteristics in student nexus experiences are reflected in different models. For example, Neumann's (1994) tangible nexus concerns extended knowledge and research skills taught by lecturers, which are echoed by the elements from Healey's (2005) research-led teaching and research-oriented teaching types, and the modes of getting knowledge from recent research, learning research methods modules, and development of research skills (Zamorski, 2002). The inquiry ethos of research from Neumann's

(1994) intangible nexus is also found in Healey's (2005) research-oriented teaching type. However, the tangible aspects of research remain the main and most familiar content in the student nexus experiences as suggested in many studies (e.g. Zamorski, 2002; Robertson and Blackler, 2006; Healey et al., 2010; Clark and Hordosy, 2019; Griffioen, 2020). The intangible aspects of research are more related to student nexus perceptions (perceived outcomes and impact, evaluations, and engagement etc.), especially motivation in research and learning as well as beliefs of the value of the nexus (e.g Turner et al., 2008; Fuller et al., 2014; Vereijken et al., 2020).

The key instruments

In spite of its profound influence in the research-teaching nexus literature, Healey's (2005) nexus-type framework has rarely been used to directly operationalise student experiences. As introduced in Section 2.7, the studies conducted by Ball and Mohamed (2010), Van der Rijst et al. (2013), Abdel Latif (2019) and Osnes and Skaug (2019) incorporated Healey's (2005) four nexus types but in limited ways. Instead, a group of scholars (Verburgh et al., 2007; Turner et al., 2008; Healey et al., 2010; Spronken-Smith et al., 2014) have employed Healey et al.'s (2010) questionnaire, which was developed in 2002, to measure student awareness, experiences and perceptions of the research-teaching integration. With similar research designs and utilising the same instrument, their studies helped provided fruitful information on students' passive experiences (awareness), active experiences, and perceived impact on learning, including both contextual understanding and possible cross-context comparisons.

The majority of the items in Healey et al.'s (2010) questionnaire were binary questions, asking whether students had noticed or experienced the listed specific research activities. As straightforward as it was, the instrument was easy to use and interpret the results. It also allowed straightforward comparisons across different contexts. Nevertheless, as it only asked yes-no questions, it could not indicate to what extent students experienced the research-teaching nexus. Additionally, with specific research activities listed, it tended to pre-fix the 'window' for students' perceptions. This might conceal some true opinions of students.

The other key instrument that measures students' perceptions of the research-teaching nexus is SPRIQ (Visser-Wijnveen et al., 2016), which has also been applied in several studies (Vereijken et al., 2018; Miulescu, 2019; Vereijken et al., 2020). SPRIQ helps identify a comprehensive range of attributes in students' perceived research-teaching nexus, including tangible (reflection, current research, participation, quality) and intangible aspects (motivation and beliefs), in either particular modules or the overall curriculum. Different from Healey et al.'s (2010) questionnaire, which

describes specific and detailed research activities, the clear scales of SPRIQ help enable wider applicability in different statistical analyses.

Perceived benefits and drawbacks in nexus engagement

In the literature, regardless of their backgrounds, many students seem to agree on the benefits and drawbacks of research-teaching integration. Regarding the benefits, students perceive that they have developed a better understanding of course content, gained up-to-date disciplinary knowledge, learned research methods and research skills, and their interest in research and learning was stimulated (Jenkins et al., 1998; Lindsay et al., 2002; Turner et al., 2008; Ball and Mohamed, 2010; Healey et al., 2010; Fuller et al., 2014; Spronken-Smith et al., 2014; Miulescu, 2019; Osne and Skaug, 2019). Because these common positive evaluations are drawn from a variety of student groups in terms of disciplines, geographical locations, and years and levels of study, with different research methodological designs and implementation, it is confident that most students can perceive the benefits of research-teaching integration which are believed by academics, too (e.g. Neumann, 1992; Li et al., 2015).

Lack of lecturer availability and compromised teaching quality are among the most experienced drawbacks or frustrations brought by research-teaching integration from the view of students (Neumann, 1994; Jenkins et al., 1998; Lindsay et al., 2002; Zamorski, 2002; Turner et al., 2008; Healey et al., 2010; Spronken-Smith et al., 2014). These findings also echo similar concerns from the academic perspective that research and teaching are in competing roles for lecturers (e.g. Coate et al., 2001; Schulz, 2013). On the contrary, Ball and Mohamed (2010) explicitly reported that students in their study did not feel their contact time with lecturers who conducted research was negatively impacted. Besides the relatively small sample size and the narrow focus of the respondent group, the sampled university was less research-intensive. Thus the role conflicts of lecturers involved in research were likely to be less than those who were at research-intensive universities, such as the universities reported in the studies of Neumann (1994), Zamorski (2002), Turner et al. (2008) and Spronken-Smith et al. (2014).

In general, most students from previous studies perceive the benefits to outweigh the drawbacks of the research-teaching integration, and have positive attitudes towards the integration. It is noticed that the evaluations of the advantages and disadvantages are largely based on students' overall research-teaching nexus experiences. Little evidence has shed light on whether or to what extent particular kinds of research-teaching integration have an impact on particular aspects of student nexus perceptions or engagement. Meanwhile, some student experiences come from particular

modules, which tend to be more context-specific. These experiences and perceptions need to be generalised or transferred with great caution.

Differences across disciplines, institutions and countries

Several studies have revealed disciplinary differences in student experiences of and engagement with the research-teaching nexus (Robertson and Blackler, 2006; Healey et al., 2010; Griffioen, 2020). Particularly, two very similar findings were reported by Healey et al. (2010) and Griffioen (2020). The former scholars found that Business School students had much fewer active experiences with research than students from the School of Leisure, Tourism, Hospitality and Sport at a less research-intensive university in the UK, and the latter suggested that Economics and Business students had less active and also less passive involvement in research than Sports students. Both findings were drawn from large-sampled questionnaire-based surveys, while Healey et al. (2010) calculated the sum of active research experiences reported and Griffioen (2020) examined the mean scores of the research involvement scales. This similarity was not at odds with Robertson and Blackler's (2006) argument that the visibilities of research would have an impact on student research involvement. Usually, in soft disciplines like business schools, research was more likely to be in more intangible forms. When students did not fully recognise the presence or opportunities of research, they could hardly get actively involved. By contrast, research was more tangible and visible in hard disciplines like sports. Thus, students could more easily notice research opportunities and get involved.

While the availability of research resources can play an important part in shaping the research-teaching integration, few scholars have directly looked into the differences in student nexus experiences and engagement between research-intensive and less research-intensive universities, except for Turner et al. (2008). In addition to higher awareness of research, Turner et al. (2008) suggested that students at research-intensive universities perceived both higher positive and negative impacts of nexus experiences than students at less research-intensive universities. As reminded by scholars from research-intensive universities (Zamorski, 2002; Robertson and Blackler, 2006; Clark and Hordosy, 2019), it appeared that there was considerable variation in student attitudes towards the nexus experiences among their students. Regarding the increased research experiences, students who highly valued the research-teaching integration were likely to take advantage of them, whereas students who did not consider research important for their learning were likely to see them as burdens.

Cross-country comparisons are rarely seen in the student-focused nexus studies. Administered with the same instrument, Turner et al. (2008) and Spronken-Smith et al. (2014) compared the

awareness, experiences and perceptions of students in the UK, Canada and New Zealand. Among the detailed research aspects, noticeably, the students from UK universities reported much more experiences of taking dissertations than the students in Canada and in New Zealand. Students in New Zealand perceived more research skill development, and students in Canada contributed to research output the most. The comparisons were straightforward and clear, providing a sketch of the student nexus experiences in the three countries. However, the participant number across the universities was not balanced, as participants from the research-intensive UK were much fewer than the other three universities.

The developing nexus experiences across student lifecycles

The only two longitudinal studies from Clark and Hordosy (2019) and Vereijken et al. (2020) stood out from the 23 student-focused studies, displaying the development and changes in student nexus experiences over time. Similarly, data were collected on a yearly basis across three years of the entire undergraduate education at research-intensive universities. Contrastingly, the former study took a qualitative approach with semi-structured interviews with 40 students from multiple disciplines, and the latter study took a quantitative approach with questionnaire-based surveys involving 947 students within the Medicine discipline. The research designs, implementation, and interpretation of both studies were solid. The study by Clark and Hordosy (2019) portrayed the three developing phases of the research-teaching nexus in student experiences. The scholars highlighted that as the nexus experiences were dynamic, active and affective, students might progress through the phases very differently depending on a range of factors. While the focus of Vereijken et al.'s (2020) study was to investigate the impact of a curriculum change with increased research-teaching integration, similar findings were spotted that certain aspects of students' nexus perceptions fluctuated or even decreased as students moved towards senior years (e.g. student beliefs about the relevance of research for practice). Nevertheless, Vereijken et al. (2020) suggested an overall improvement in students' motivation for research and beliefs about the nexus importance along with increased exposure to research in the curriculum study.

Although the other studies were all cross-sectional, some did have reflected differences in nexus experiences across academic years. Most studies agreed that in general as undergraduate students approached later years of study, they experienced more research-teaching integration and engaged with the integration more positively (Lindsay et al., 2002; Neumann 1994; Spronken-Smith et al., 2014; Griffioen, 2020). Still, in line with Clark and Hordosy (2019) and Vereijken et al. (2020), Griffioen (2020) revealed some fluctuations or decrease in particular aspects of student nexus experiences and engagement with disciplinary differences. For example, engineering students'

interactions with researchers peaked in middle academic years, and the perceived impact of research on learning by Economics students dropped almost year by year. Different from the two longitudinal studies that were both conducted at research-intensive universities, Griffioen's (2020) study took place at an applied university with over 2000 questionnaire participants across soft and hard disciplines. Regardless of disciplinary subjects and university types, it seems difficult to grasp clear or consistent student beliefs of the value of integrating research into teaching.

2.9 Concluding comments: research gaps

As can be seen from the above literature review, despite a growing trend of student-focused research-teaching nexus studies in very recent years, several research gaps are spotted. To start with, corresponding to the diversified academic understanding of 'research', how do undergraduate students understand and interpret the concept of 'research'? It is rarely presented in the existing literature. Because undergraduates do not necessarily share the same understanding of 'research' with academics, clarifying their definition of 'research' can help better understand undergraduate students' experiences of, and engagement with the research-teaching nexus.

While Healey's (2005) nexus-type framework is of great influence in nexus studies and has been widely referenced, it is mostly used as theoretical guidance for academics to understand the research-teaching nexuses and help with their pedagogical designs. Limited evidence is shown on what Healey's (2005) nexus types are perceived in student experiences, or whether the different types can be perceived by students at all in practice. While many previous studies have indicated some commonly perceived benefits and drawbacks from student experiences of the research-teaching nexus, most of them focus on the overall importance of integrating research into teaching. It is still not clear in what ways and what nexus types are important specifically. The operationalisation of Healey's (2005) nexus-type framework in student experiences helps identify whether or what particular nexus experiences are related to particular aspects of students' learning at universities.

Existing research-teaching nexus studies display a wide range of disciplines and geographical locations. However, it can hardly find any study that reports student experiences of the research-teaching nexus in the Chinese context in spite of the considerable size and influence of the Chinese higher education sector. By contrast, although there have been a number of student-focused nexus studies carried out in the UK, the scope of business schools is still under-represented. In addition, there are limited cross-country comparisons of student nexus experiences in the literature. The

Chapter 2

comparisons of the undergraduate students' experiences of, and engagement with the research-teaching nexus at research-intensive universities between China and the UK are novel.

Chapter 3 Methodology

3.1 Introduction

This chapter describes the methodological design, research methods, assumptions and choices of this study. It begins with a description of the research aim and research questions (Section 3.2), followed by the sequential mixed methods research design with a discussion of its underpinning philosophical position (Section 3.3). The chapter then describes the participant recruitment processes, the details of data collection and data analysis (Sections 3.4-3.6). The measures taken to ensure rigour in research (Section 3.7) and consideration for research ethics (Section 3.8) are discussed.

3.2 Research aim and research questions

As implied by Chapter 2, whilst many studies have looked into the topic of the research-teaching nexus, the research-teaching nexus presents various pictures across different geographical and disciplinary contexts due to its complex nature. In the very recent years, there has been growing attention on student awareness and perceptions of the research-teaching nexus. However, the voices of undergraduate students still remain underrepresented. Only a handful of the research-teaching nexus studies have provided international institutional comparisons from the student perspective (e.g. Turner et al., 2008). In addition, almost no student experiences of the nexus in the Chinese context have been presented so far. To contribute to closing the gap, this study aims to unveil student experiences of the research-teaching nexuses and how they engage with the nexuses from the perspective of business school undergraduate students at research-intensive universities in China and the UK. The research questions are as follows:

- RQ1: What types of research-teaching nexus do business school undergraduate students experience at research-intensive universities in China and the UK?
- RQ2: How do business school undergraduates engage with the research-teaching nexuses that they experience at research-intensive universities in China and the UK?
- RQ3: Are there any relationships between different nexus types and the ways business school undergraduate students engage with the nexuses at research-intensive universities in China and the UK?

3.3 Research design

3.3.1 Sequential mixed methods design

Considered as *'the third methodological movement'* (Doyle, Brady and Byrne, 2009, p.175), mixed methods design has been widely employed in education and other social science research in the last few decades. Mixed methods can be broadly defined as a research design where both qualitative and quantitative approaches are combined and integrated in the same research project (e.g. Greene, Caracelli and Graham, 1989; Tashakkori and Teddlie, 2003 & 2010; Newman, Ridenour, Newman and Demarco, 2003; Johnson and Onwuegbuzie, 2004; Miller and Gatta, 2006; Johnson, Onwuegbuzie and Turner, 2007; Creswell, 2009; Biesta, 2010 & 2017). More specifically, both qualitative and quantitative elements can be seen in the format of data, data collection and analysis methods, designs, epistemologies, ontologies, research purposes and practical orientations (Biesta, 2010 & 2017). As Tashakkori and Creswell (2007) summarised, in a mixed methods study, there might be different types of research questions with qualitative and quantitative approaches, sampling in both probability and purposive procedures, collecting numerical and textual data, conducting statistical and thematic data analysis, and drawing conclusions with both objective and subjective interpretations. It is worth highlighting that more than simply 'containing' both qualitative and quantitative approaches, good 'integration' of the two approaches is vital for mixed methods research to achieve its aims.

Scholars have outlined many reasons why mixed methods design has become increasingly popular in social science research. For example, Greene et al. (1989) identified five main rationales for choosing mixed methods design: triangulation, complementarity, development, initiation and expansion. Bryman (2006) built upon Greene et al.'s (1989) work and expanded to 16 rationales from a review of 232 social science mixed methods articles. Based on the rationales suggested by Greene et al. (1989) and Bryman (2006), the current study justifies its sequential mixed methods design in the following respects.

First, mixed methods design helps the study answer its different research questions appropriately. With both exploratory and explanatory intentions, the study raises research questions from different aspects to investigate the intricate research-teaching nexuses that are experienced and perceived by business school undergraduate students at research-intensive universities in China and the UK. While a single qualitative or quantitative approach cannot fully meet the research aims, the sequential phases in the mixed methods design address different research questions appropriately. Specifically, the first two research questions are addressed by both qualitative and quantitative

phases. What nexus types are experienced by the students and how they engage with the nexuses are explored (qualitatively) as well as explained and expanded (quantitatively). While the third research question of the relationships between the student nexus experiences and engagement can only be responded to by a quantitative approach, the fruitful information acquired from the qualitative findings also helps speculate the reasons and stories behind the revealed relationships. Such mixed methods design and implementation enhance the quality of the 'mix', as qualitative and quantitative elements are thoroughly integrated at different levels and in different aspects of the research (e.g. Johnson and Onwuegbuzie, 2004).

Second, the integration of qualitative and quantitative approaches inspires a more comprehensive and deeper understanding of the investigated topic. With both interpretive illustration and statistical explanation, the study is able to present a more complete and accurate picture of what types of research-teaching nexus are experienced by business school undergraduate students at research-intensive universities in China and the UK, how they engage with the nexuses, and what are the relationships between the experienced nexus types and the ways of nexus engagement. For example, on one hand, statistical evidence helps test and possibly expand the coverage of the thematic findings. On the other hand, qualitative interpretation elaborates more details and brings the real students behind the numbers to the audience.

Third, taking ideas from the sequential exploratory strategy (Creswell, 2009) or an exploratory sequential mixed methods design (Creswell and Clark, 2018), the study starts with a qualitative phase (focus group interviews) with a quantitative phase (questionnaire-based survey) following. The key consideration for such an order is to make sure that the instrument selected for the survey (SPRIQ and adapted items from Healey's (2005) nexus-type framework) is applicable, relevant to, and as context-specific/cultural-specific as possible (Creswell and Clark, 2018) for the undergraduate participants from business schools at research-intensive universities in China and the UK.

As introduced in the Literature Review chapter, SPRIQ explicitly and comprehensively identifies attributes in student engagement with the research-teaching nexus. It was developed and validated by Visser-Wijnveen et al. (2016) in rigorous processes based on studies at a research-intensive university in the Netherlands, and was applied in several other studies that took place at the same Netherlands university (Vereijken et al., 2018; Vereijken et al., 2020) and at a research-intensive university in Romania (Miulescu, 2019). It has not been administered in the UK or China yet. Also as mentioned earlier, Healey's (2005) nexus-type framework has not been much utilised for operationalising student experiences of research-teaching nexus in spite of its wide influence and application. Meanwhile, Healey's (2005) framework was developed at a less research-intensive

university in the UK. As indicated by previous studies (Turner et al., 2008; Spronken-Smith et al., 2014), considerable differences can be found in the nexus experiences and engagement of students from research-intensive and less research-intensive universities and from different countries. Some studies have shed light on the research-intensive universities in the UK and suggested the possible applicability of Healey's (2005) framework (e.g. Zamorski, 2002; Turner et al., 2008; Clark and Hordosy, 2019). However, little is known about the Chinese context, and particularly no existing literature operationalises nexus experiences and engagement from the student perspective. Therefore, before carrying out the survey, it is important to explore to what extent the selected instruments are relevant to the target student group in the current study, especially students in China. Built upon findings from the qualitative phase, additional or adapted variables or measures can be developed in the instrument that is used for the following quantitative phase. This helps to improve its fit for the specific contexts and cultural backgrounds (Creswell and Clark, 2018).

Another consideration for beginning with a qualitative phase is its inclusiveness to possibly reveal the most authentic opinions from the students. If the other way around, some student ideas might be omitted, altered, or concealed as discussed regarding Healey et al.'s (2010) study in Section 2.8. In this way, starting with the qualitative phase also helps improve the overall truth value.

As a reminder, this study borrows ideas from, but is not considered a particular sequential exploratory strategy or an exploratory sequential mixed methods design. This is because the above terms usually indicate that the primary focus is on the qualitative approach and the quantitative part tends to be in an auxiliary role (Creswell, 2009), or that a third phase is potentially required to validate or further develop the instrument (Creswell and Clark, 2018). The qualitative and quantitative content is equally weighted in the current study. The two-phase design fulfils the research aim as developing a questionnaire for generalised use is not intended. Following a pragmatic approach as further explained in Section 3.3.2, the QUAL-QUAN design addresses the research questions appropriately in a parsimonious model way.

Last but not least, undertaking a mix of qualitative and quantitative approaches helps triangulate and improve the trustworthiness and rigour of this study (Guba, 1981). As Firestone (1987) suggested, employing different methods to investigate the same issues helps evaluate the '*robustness and stability of findings*' (p.20). If similar results are revealed under different approaches, the findings tend to be solid. If results are dissimilar, it implies potential future directions of research. With the reasons explained above, this study adopts a two-phase sequential mixed methods design as follows.

Phase 1

The first phase consists of 18 focus group interviews (six in China and twelve in the UK) with volunteer undergraduate students who are studying in business schools at the selected research-intensive universities in China and the UK.

This phase aims to answer RQ1 and RQ2, exploring what research-teaching nexus types are experienced by the participants and how they engage with the nexuses respectively. Phase 1 also helps to examine the applicability of the questionnaire templates to be used in the Phase 2 survey. Based on Phase 1 thematic analysis, revised and additional questionnaire items are formulated to ensure the questionnaire used in Phase 2 is up-to-date and suitable for application in business schools in China and the UK.

Phase 2

The second phase involves a large-scale survey (valid questionnaire responses: 408 in China and 162 in the UK) with business school undergraduates from the selected research-intensive universities in China and the UK. Built upon the previous phase, Phase 2 endeavours to provide a description of the specific research-teaching nexus types experienced by the participants (RQ1), the ways of nexus engagement (RQ2), and the relationships between the experienced nexus types and the ways of nexus engagement (RQ3). The questionnaire employed in Phase 2 is designed based on existing questionnaires templates, including adapted items from the nexus theoretical framework by Healey (2005), SPRIQ by Visser-Wijnveen et al. (2016), and additional items from the Phase 1 thematic analysis results. It takes approximately five minutes to complete the questionnaire. Table 3.1 displays the two phases in research design and their corresponding research questions.

Table 3.1 Two phases in research design and corresponding research questions

	RQ1	RQ2	RQ3
Phase 1 Focus group interviews	√	√	
Phase 2 Survey (questionnaire)	√	√	√

3.3.2 A pragmatic approach

As Doyle et al. (2009) indicated, researchers are '*urged to*' (p. 176) declare the paradigm within which their research is being carried out. The definition of paradigms can be dated back to Kuhn (1962), who defined paradigms as the fundamental philosophical assumptions and worldviews the researchers take. Agreed by many other scholars such as Morgan (2007), Doyle et al. (2009), Cohen,

Manion and Morrison (2011), Coe (2017) and Waring (2017), the paradigm embraces a set of fundamental beliefs held by the researchers and practices guiding the researchers carry out research. It includes ontology, epistemology, axiology, methodology and enquiry aim. In research, positivism and interpretivism are the traditional main paradigms standing at opposite ends of a continuum. While the former takes an objective perspective and usually explains the world in a universal and replicable way, the latter employs subjective lenses, with more interactive and contextualised findings demonstrated (Cohen et al., 2011; Punch & Oancea, 2014; Waring, 2017).

With the growing application of mixed methods research, the dominance of the traditional paradigms of positivism and interpretivism has softened and a new perspective of pragmatism has drawn much attention. Nevertheless, the concept of pragmatism is not new and can be dated back to the early 1900s, when the development of modern science started to shed light on traditional philosophical views (Scheffier, 2011). Charles Sanders Peirce, William James, John Dewey and George H. Mead are widely considered the major contributors who conceptualised pragmatism as '*a philosophic alternative to abstract and rationalistic science*' (Goldkuhl, 2004, p.1). Particularly, in the education context, Dewey highlighted the importance of developing inquiries and actions in the contingent real-world environment and solving real problems (Dewey, 1909; Scheffier, 2011; Hall, 1996; Teddlie and Tashakkori, 2003). In other words, problems in specific situations lead the ways of the investigation and solutions.

There has been an argument among scholars about the philosophical position of pragmatism. On one hand, scholars like Johnson and Onwuegbuzie (2004) considered pragmatism as a third paradigm, and as the '*philosophical partner*' (p.16) of mixed methods studies. On the other hand, Coe (2017) indicates that some pragmatists questioned the whole concept of paradigm. They considered pragmatism as not a new paradigm, but a challenge to the traditional notion of paradigm.

Regardless of the philosophical nature of pragmatism in relation to research, and in act of pragmatism itself, it informs this study and echoes many other scholars (e.g. Johnson and Onwuegbuzie, 2004 & 2007; Doyle et al., 2009; Creswell, 2009; Coe, 2017; Biesta, 2017; Waring, 2017). All these scholars agree that pragmatism emphasises that choices of research design and methods should start from the research problems and questions. It is therefore a needs-based approach that looks for tailored solutions as the best options to achieve the aims of a piece of research and to answer the research questions. In this way, as Johnson and Onwuegbuzie (2004) put it, pragmatism is closely linked with mixed methods research design. This is because the integration of different philosophical views and methods is usually needed to provide a more comprehensive

answer to research questions, especially in the education domain where problems are complex in nature. In their words, '*pluralism and eclecticism*' (p. 18) are welcomed.

Nevertheless, while integrating elements from different approaches enables this study to have a thorough understanding of the undergraduate research-teaching nexus experiences and engagement at research-intensive universities in China and the UK with both width and depth, challenges are awaiting. Scholars including Guba and Lincoln (1982) and Bryman (2006) warned that contrasting ontological and epistemological stances are incompatible so the integration would be questionable. Possible solutions are suggested by Johnson and Onwuegbuzie (2004), that some common points between different paradigms can be considered as bridges where they can be connected legitimately. Also, Firestone (1987) indicated that different methods can be bridged via rhetorical connections and the results can be complementary.

It is worth reminding that the current study is not a formal international comparative study. The study does not follow the traditional approaches of variable-oriented or case-oriented comparative research. As introduced by Shavit, Arum and Gamoran (2007), variable-oriented comparative research intends to make generalisations based on the results of tested hypotheses about the relationships between the variables, whereas case-oriented comparative research focuses on the in-depth and full understanding of each case. In the process of responding to the research questions, this study adopts a conservative approach in comparing findings between China and the UK. For one reason, whilst there are statistical analyses based on country-specific datasets, no statistical comparisons are attempted for research rigour because no measurement invariance testing is completed. For another reason, due to the differences in cultural and sociological background between China and the UK, statistical comparisons tend to be more problematic philosophically than methodologically. As Matsumoto and Juang (2003) suggested, cross-cultural studies not only compare and contrast behaviours, but also indeed investigate the underpinning psychological principles in different cultures. This study is not a case-oriented comparative study either, as the research is not aimed at providing holistic pictures of particular cases. While formal generalisation of findings is not intended in this study, the empirical evidence can still be transferable (Lincoln and Guba, 1985).

3.3.3 Strengths and limitations of the research design

As this study has an integrated exploratory and explanatory purpose, the sequential mixed methods design seeks to address different aspects of the research questions appropriately. This is in line with Creswell and Clark's (2007) argument that mixed methods can usually respond better to research

questions which cannot be solely addressed by a qualitative or quantitative approach. To achieve the aim of the research, this design can be considered as fit for purpose (Cohen et al., 2011; Punch and Oancea, 2014).

Specifically, the integration of qualitative and quantitative stances enables a balanced view with width (traditionally quantitative and positivist) and depth (traditionally qualitative and interpretivist) of the research topic. Both generic and contextualised features can be identified in the research-teaching nexus experiences and ways of engagement from the perspectives of business school undergraduate students at research-intensive universities in China and the UK. Meanwhile, the qualitative and quantitative data can be mutually complementary to enhance the robustness of the findings. Results from the different methods across different phases also help provide a fuller explanation and more insights into the investigated issues. For example, Phase 1 focus group interview findings suggest that there are hybrids in the nexus types experienced by the participants, and Phase 2 survey findings provide a statistical description of how these types hybridise. These strengths largely echo Greene et al.'s (1989) rationales for choosing a mixed methods research design, which has been referred to and empirically approved by many scholars (e.g. Teddlie and Tashakkori, 2003; Bryman, 2006; Biesta, 2017).

Admittedly, this research design has some limitations. First, the study has a cross-sectional design. To a certain degree, it cannot present the dynamic and affective nature of the research-teaching nexus (Clark and Hordosy, 2019). Also, the first data collection (Phase 1 focus group interviews in China) started in December 2018, and the last data collection (Phase 2 survey in the UK) ended in March 2020. The relatively long time span in the data collection process might threaten the truth value and consistency of the study, as there might be changes between the time points but it is still regarded as cross-sectional. In the future, longitudinal studies can be considered to perceive the evolving features of the research-teaching nexus. Second, the statistical analysis in Phase 2 does not suggest causal relationships between the experienced nexus types and the ways of nexus engagement. Interpretation of the findings needs to be attentive. Third, applying or transferring findings of this study should also be cautious, as the study focuses on a particular student group, disciplinary area, university type, and specific countries.

3.4 Participant recruitment

3.4.1 Selecting the sampled universities in China and the UK for both phases

Before recruiting the participants, the study needs to decide on the sampled universities in China and the UK, including how many universities and which universities to be examined. As stated in the research aims and research questions, the current study investigates undergraduate student experiences of the research-teaching nexus and ways of nexus engagement at business schools from research-intensive universities in China and the UK. While a sample-to-population generalisation of the findings is not intended, the study endeavours to provide a more comprehensive understanding with reasonable depth of the investigated topic in business schools at research-intensive universities in China and the UK, and case-to-case transfer is possible (Punch and Oancea, 2014). Therefore, taking the needs and practicality into consideration, two universities from each country were selected. While domestic comparisons are not conducted in the current study, it allows future research based on the data collected. Possible similarities and differences between the universities from the same country will help further reveal the complex and nuanced nature of the research-teaching nexus.

The sampled universities were selected for comparability and accessibility reasons. Regarding comparability, the following factors were considered. First, all the selected universities were outstanding research-intensive universities in each country. The Chinese universities were listed among Double First Class universities since the first round, and the UK universities were both Russell Group universities. They shared many characteristics in common including the considerable amount of research funding received, favourable promotion schemes for staff who conducted research, and good league table rankings. All the characteristics mentioned above were related to the research-teaching nexus. Second, they all had business schools with a large number of students, and ran a wide range of EFAM related modules. While the UK universities had relatively smaller department sizes compared to the Chinese universities, the number of students was similar when compared within the same country. Third, within each country, the two universities had a small gap in league table rankings and historical reputation, and were located in different regions. The slight diversification helped provide sources to gain a more comprehensive understanding of the topic if domestic comparisons were going to be made. In terms of accessibility, the participating universities were practically available to the researcher based on preliminary contact. Therefore, the university selection process used a combination of criterion sampling and convenience sampling. For

anonymity, the names of the sampled universities were coded with alphabetical letters. The universities were coded as CN1 and CN2; UK1 and UK2.

To approach the sampled universities, following some preliminary contact based on the researcher's personal contacts, different gatekeepers at each university were visited in person. Here, the gatekeepers referred to the persons who could give permission to carry out the study at the university and help the researcher gain access to the participating students. Depending on different organisational and power structures, the gatekeepers turned out to be administrative managers or academic unit heads. In the meetings with the gatekeepers, the researcher introduced herself and briefly explained what the research was. The potential positive impact and the unlikely adverse influence were both explained. The ERGO documents, a sample of the recruitment message, Phase 1 discussion outline and Phase 2 questionnaire drafts were also shown to the gatekeepers. A summary report upon request would be provided as an appreciation for the support of the participating universities.

3.4.2 Recruiting participating students for both phases

With the gatekeepers' permission and support, the researcher was able to access the potential participants. The target population were undergraduate students who were studying in business schools and had undertaken EFAM related modules. Academic years (Years 1-4 in China and Years 1-3 in the UK) were not restricted. Therefore, the sampling frame would be the programme enrolment sheets. However, due to the accessibility allowed, the enrolment sheets were not acquired in any of the universities. The participants were recruited following criterion sampling and snowballing sampling strategies.

In Phase 1, the gatekeepers at the Chinese universities introduced several student representatives from different programmes and student unions to help the researcher advertise the recruitment. Via the student representatives, the recruitment text message was forwarded in students' social network groups, mainly WeChat groups. The volunteer participants contacted the researcher via WeChat with suggested available slots for the focus group interviews. The researcher then allocated the volunteers into focus groups based on their availabilities and mixed their backgrounds as much as possible.

In the UK, the recruiting process was slower and more challenging. With approval from the universities, recruitment posters (as attached in Appendix A) were stuck to bulletin boards on campus. An electronic version of the poster was posted on Facebook. With few applicants recruited from the posters, the researcher emailed a considerable number of teaching staff in business

schools, asking for their permission to advertise the research in class or help forward the information to their students. The researcher also talked to the students in the department social space and joined several open departmental social networking events to recruit participants. Once the first few focus groups were formed, the snowballing sampling started to make a difference. Invited by the early participants, more volunteers were engaged and took part in the interviews.

At the end of the interviews, the participants were asked whether they would like to participate in the follow-up research (Phase 2). If the answer was yes, they were invited to leave contact methods for follow-up participation. If the answer was no, their participation ended and no follow-up contact would be made with them. A summary report of the study will also be sent to the participants at their request.

In Phase 2, for the Chinese universities, the researcher first contacted the participants who expressed their willingness to continue participation from Phase 1. The QR code of the online questionnaire was sent to the participants. The participants were invited to help with questionnaire dissemination in WeChat groups, too. With permission from the gatekeepers and lecturers, the survey was advertised in several classes and at student events. The participation was completely voluntary. There were prize draws upon questionnaire submission as thanks.

For the UK universities, similarly, Phase 1 participants who agreed to participate in the following survey were contacted first. The link of the online questionnaire on iSurvey was sent and peer dissemination was encouraged. With limited responses, the researcher visited business school lectures (with lecturers' permission) and social spaces in business school buildings to recruit questionnaire respondents in person.

3.5 Data collection

Guided by the two-phase sequential mixed methods design, data collection was conducted as follows.

Phase 1

Face-to-face focus group interviews with business school undergraduate students from the selected universities were carried out in China between December 2018 and January 2019 (approaching the end of the autumn semester), and in the UK between March and April 2019 (in the middle of the spring semester).

In total, there were 42 participants in China and 38 participants in the UK. The detailed participant numbers by group and by university are demonstrated in Table 3.2. All participants in China were native Chinese students, and their academic years ranged across all four years. In the UK, there was a mix of native and international students. All the UK participants were studying in Year 2 or Year 3 (placement year excluded if applicable), and no Year 1 students participated in the focus group interviews³. In China, there were five to eight participants in one group. Because of the availabilities of the recruited participants, the group sizes were smaller in the UK, made up of three or four participants per group. While scholars usually suggested a group size of five to seven for focus group interviews (Hopkins, 2007; Creswell, 2014; Gibbs, 2017), this study found that with effective facilitation, the discussion can be productive with different group sizes. While the diversity in larger groups often evoked more thoughtful debates, the less-formal and close-to-each-other atmosphere of smaller groups tended to encourage participants to open up more and extended their answers.

Table 3.2 Numbers of Phase 1 focus group interview participants by country and university

Country	Sampled university	Focus groups	Participants
China	CN1	3	24
	CN2	3	18
UK	UK1	5	15
	UK2	7	23

The benefits of different group sizes were not at odds with the reason for choosing focus group interviews instead of individual interviews. As explained by Creswell (2014) and Gibbs (2017), in comparison with individual interviews, focus group interviews are usually considered more helpful in exploring shared opinions and evaluation. The interactions amongst the participants helped illuminate each other, and thus provided a wider variety of ideas and more in-depth information about their experiences of and engagement with the research-teaching nexus.

All the focus group interviews conducted in both countries were semi-structured with the same discussion outline, guiding the participants to talk about their experiences and opinions towards the various research-teaching nexuses. Usually one day before the scheduled interviews, the discussion outline was sent to the participants together with the Consent Form and Participant Information

³ Two first year undergraduates contacted the researcher to participate but cancelled before the focus group interviews.

Sheet for their reference. The participants were also provided with the discussion outline on the day of the focus group interviews. The prompting questions are as follows:

1. In your opinion, what does 'Research' mean in the context of business schools?
2. Did you notice your lecturers from business school modules integrating any component of research into teaching?
3. a) If so, how did they integrate research into teaching?
b) How do you like the integration?
4. If you didn't notice any integration of research and teaching, could you think of some possible reasons?
5. Do you think research should be integrated into teaching in business school modules, and does it matter to you? Why?
6. What factors do you think that may influence your feelings and attitudes about the integration of research into teaching?

With an intention to respond to RQ1 and RQ2, the questions in the discussion outline were developed based on issues raised in the literature review. Student understanding of the 'research' notion was scarcely presented, and there might be gaps in understanding between students and academics (e.g. Zamorski, 2002; Healey et al., 2010; Buckely, 2011). The perceived research-teaching integration is heavily based on what content is considered 'research' by the students. Students cannot realise the research-teaching integration if they do not even know that certain content presented in teaching is research. The idea is also evidenced by Zamorski (2002) and Turner et al. (2008), as their studies indicated that students did not always recognise the research-teaching integration they were experiencing. Additionally, in focus group interviews (student backgrounds were intentionally mixed as much as possible), discussion among the participants can help illuminate the participants. For example, even if some participants do not have clear ideas about what counted as research, answers from other participants might help remind them of related activities in their learning experiences. In these respects, the first question was set to understand student opinions of research.

Then, with freshly summarised 'what is research', students were asked about what specific research elements were integrated into teaching in their experiences and how. Q2 and Q3a intended to directly capture what Healey's (2005) nexus types were perceived by the participants. Particularly, they also helped to identify to what extent the theoretical framework applied in the Chinese context as no evidence was shown in the literature. Q4 was designed to prompt the reasons if participants

did not see a research-teaching nexus (e.g. Zamorski, 2002; 2008). The reasons reflected by students could be compared to the suggested reasons by the scholars.

Q3b, Q5 and Q6 concerned how students engaged with the research-teaching nexuses. In addition to exploring the applicability of SPRIQ in both China and the UK, they tried to prompt more open discussion that would provide more details in understanding the topic and help interpret and speculate findings from both the focus group interviews and the survey. Noticeably, Q5 indicated the beliefs attribute in SPRIQ and stood as a separate question. Some contradictory findings about student beliefs of the importance of research-teaching integration were indicated in previous studies (e.g Lindsay et al., 2002; Neumann, 1994; Verburch and Elen, 2011). As crucial as it was, the beliefs attribute was also considered an intangible aspect of the research-teaching nexus (Neumann, 1994), which might be less straightforward for students to review in their nexus experiences and engagement. Therefore, participants were invited to contribute to this aspect specifically.

A full discussion outline is attached in Appendix B. For participants in China, the outline was provided in Chinese. The Chinese version was translated by the researcher, and back-translated by a secondary school English teacher in China, who was fluent in both English and Chinese and independent of the study.

The interviews ran about 40 to 65 minutes, mainly depending on the number of participants in a group. Coordinated by the researcher, every participant was ensured to have chances to talk about their own feelings and opinions about the topic. Discussion and interactions were valued for exchanging and further generating ideas. While generally following the discussion outline, the participants were also encouraged to extend a little bit and express their thoughts relevant to the topic in an open way. When they did so, the researcher would usually build upon what they had said, ask follow-up questions, and facilitate other participants to elaborate on the content. For example, when some participants talked about whether research should be integrated into teaching, they mentioned league table rankings. The researcher asked about their opinions about the rankings and their understanding of the 'research-intensive' universities. The contingency in different groups brought many illuminative discoveries in the topic that are described in Chapter 4.

Due to the different accessibilities in each university, the interviews were conducted in different places on campus, including meeting rooms, social spaces, and cafes. Refreshments and e-vouchers were provided to every participant as reimbursement. With consent from the participants, all the focus group interviews were audio recorded and fully transcribed into written transcripts for data analysis purposes. During the interviews, the researcher also took notes of the discussion to avoid

technical issues of the recorder, and to mark some emphases in speaking as well as some additional details like facial expressions.

Phase 2

The survey of business school undergraduate experience of research-teaching nexus and nexus engagement was conducted in Phase 2. For the universities in China, the survey was conducted between June and July 2019 (the end of the spring semester). The questionnaire was distributed on www.wjx.cn, the largest online survey platform in China. For the universities in the UK, the questionnaire was distributed both on iSurvey and in hard copies between November 2019 and March 2020 before the national lockdown due to Covid-19. The study used different online survey platforms because of the domestic firewall settings in China. Except for the consent question, none of the questions in the questionnaire was compulsory to answer, which meant respondents could skip any question and could still finish the survey. This fully ensured the voluntariness of the respondents.

In total, 686 responses were collected, among which 490 were from China and 196 were from the UK. 570 responses were adopted in the statistical analysis (China: 408, UK: 162), as invalid responses (e.g. not from business schools), responses with missing data, and outliers were eliminated. The detailed data screen process is presented in Section 5.2.

In each of the sampled universities, the respondents covered each academic year (Years 1-4 in China and Years 1-3 in the UK). The programmes included economics, finance, management, accounting, and several other programmes related to applied economics or management. Curricula from these programmes were examined by the researcher to ensure the respondents had undertaken similar EFAM related modules⁴. For confidentiality and anonymity considerations, the detailed programme information will not be enclosed.

⁴ Due to different organisational structures, programmes in business schools might have divergent orientations. For example, some universities in China (not in this study) run engineering management programmes in business schools, which are heavily engineering oriented not EFAM oriented.

3.6 Data analysis

3.6.1 Thematic analysis: Phase 1 focus group interviews

Thematic analysis is applied in analysing the qualitative data obtained from Phase 1 focus group interviews. Whilst content analysis and thematic analysis are usually considered similar techniques in analysing narrative data in qualitative studies and sometimes the terms are used interchangeably, slight differences are distinguished (Braun and Clarke, 2006; Vaismoradi, Turunen & Bondas, 2013). As introduced by the scholars, both methods help identify and summarise patterns, codes or themes from textual data. Nevertheless, content analysis can lean towards quantifying the qualitative data as counting frequencies of occurrence is usually used in identifying themes. This study does not intend to quantify the themes identified from the focus group interview data and utilises thematic analysis.

Braun and Clarke (2006) provide a six-step guidance for conducting thematic analysis. The six steps include familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining and labelling themes, and writing the report. While the original order of the six steps inclines an inductive approach, the contents of the guidelines are applicable to both deductive and inductive approaches.

In this study, verbatim transcription was applied to transcribe all the interview audio recordings into written transcripts in their original languages. The initial transcription was processed with help of transcribing software (YouTube for English transcripts and Xunfei for Chinese transcripts). Then, the researcher carefully went through the transcripts word by word. In addition to error checks, other notes were added including accentuates and tones to help present the original discussion from the participants. The transcribing process allowed the researcher to fully familiarise herself with the data.

Both deductive and inductive thematic analysis was conducted on each transcript with the help of Nvivo. For the interviews conducted in Chinese, coding was conducted in Chinese for keeping the maximum original meanings of the discussion. Only the themes were translated into English and back-translated for credibility. The deductive thematic analysis started first, as this study had a specific interest in looking for the nexus types from Healey's (2005) theoretical framework and the engagement ways summarised from SPRIQ (Visser-Wijnveen et al., 2016). Here is an example illustrating the deductive coding process. 'Research-oriented Teaching', a type from the theoretical framework, was considered an overarching theme. As this nexus type emphasised research

methods, research skills and understanding research processes in teaching, 'research methods', 'research skills/techniques' and 'understanding research processes' were labelled as sub-themes within the 'Research-oriented Teaching' theme. The researcher searched the data, highlighting and labelling the content related to these features. For example, when there were research methods modules or data analysing software appearing in the transcripts, the modules and the software study experiences were identified as codes belonging to the above themes. The deductive thematic analysis helps match the data with Healey's (2005) framework and SPRIQ (Visser-Wijnveen et al., 2016), indicating to what extent the theories are applicable in the contexts of business schools at research-intensive universities in China and the UK.

After the deductive coding, inductive coding was conducted. It aimed at exploring emerging nexus types or ways of nexus engagement from the undergraduate student experiences at research-intensive universities in China and the UK. In this bottom-up approach, codes and themes were allowed to emerge from the data itself. What could be counted as codes and themes were fully determined by the researcher (Braun and Clarke, 2006). For example, from the participants' discussion about the meaning of research in the business school context, initial codes were generated including 'mathematic modelling', 'observation of the real world' and 'validating and developing theories' etc. Together, the codes were sorted into 'understanding of research' as a theme.

Upon completion of both deductive and inductive coding, the themes were reviewed and compared to Healey's (2005) nexus types and the scales from SPRIQ by Visser-Wijnveen et al. (2016). This was to examine whether new types and ways of nexus engagement were revealed. For example, 'Extra-curricular Integration' was specified as an additional nexus type outside Healey's (2005) framework, whereas 'understanding of research' could be considered as a sub-theme within the 'reflection' theme (as a scale) from SPRIQ (Visser-Wijnveen et al., 2016). The reviewing and comparing process also helped inform the questionnaire design.

In interpreting the thematic analysis results, besides the themes, some direct quotations from the participants' discussion were used as supporting evidence to illustrate the undergraduate experiences of the nexus types and the ways of nexus engagement in business schools at research-intensive universities in China and the UK.

3.6.2 Questionnaire modification

As described in Section 3.3.1, the questionnaire was adapted from SPRIQ (Visser-Wijnveen et al., 2016) with additional and adapted items from Healey (2005), Healey et al. (2010) and Phase 1 data analysis. The full questionnaire is attached in Appendix C.

Before deciding on the instrument, several other existing questionnaire templates were evaluated together with SPRIQ, including the questionnaires used by Breen and Lindsay (1999) and Healey et al. (2010). Breen and Lindsay's (1999) questionnaire tended to focus on the relationships between student motivation and staff research, which was decided by their research questions and not suitable for this study. Healey et al.'s (2010) questionnaire straightforwardly operationalised students' overall awareness, experiences and perceptions of the research-teaching nexus, which was of particular interest to the current study. Nevertheless, it contained mixed types of items, among which most were binary questions. The answers would only indicate what or whether certain content existed in the student nexus experiences, but not suggest to what extent this content was presented. There were a few open-ended questions, for instance, asking for an example of how staff involvement in research had positively/negatively influenced the respondents' learning. It was suspected that the response rate to these open-ended questions would be low, or even decrease the overall questionnaire response rate. As a fact, the response rates in the studies that used Healey et al.'s (2010) questionnaire were relatively low, at 16% (Turner et al., 2008), 8% (Healey et al., 2010), and a highest of 28.5% (Spronken et al., 2014). Additionally, a few multi-choice and Likert-scale items were included. The mixed types of items would also bring difficulties in statistical analysis.

In comparison, as reviewed in Chapter 2, SPRIQ was intentionally designed to measure student perceptions of nexus engagement (Visser-Wijnveen et al., 2016). It contained rigorously developed and validated constructs and scales, and covered a comprehensive range of nexus engagement attributes. This suggests that with slight context-specific adaptations, SPRIQ was the optimal instrument to be employed in the current study.

As shown in Appendix C, the questionnaire has three parts. Starting with demographic questions, Part 1 helps the respondents warm up and allows possible comparisons among different respondent groups. The questions were written based on the questionnaire used by Healey et al. (2010) and information acquired in Phase 1. For example, some participants suggested that they had different dissertation options or different study/career plans upon graduation. Questions about programme dissertation requirements and intentions to go to postgraduate study were added.

Part 2 maps the specific types of the research-teaching nexus based on the theoretical framework, constituted of 15 Likert-scale items. As a psychometric scale, the Likert scale is widely considered an effective tool for investigating respondents' perceptions and attitudes towards specific issues (Johns, 2010; Nemoto and Beglar, 2014; Bertram, 2018). Each nexus type from Healey et al. (2010) corresponds with three items illustrating the key features. While the four types developed by Healey et al. (2010) focus on the integration between research and teaching within the curriculum, participants from Phase 1 have raised additional experiences of the nexus at the university but outside the modules. Therefore, another group of three items about the extra-curricular nexus experiences are added.

Part 3 is adapted based on the final version of SPRIQ (Visser-Wijnveen et al., 2016). The complete 24 items of SPRIQ are fully incorporated, and six additional items are incorporated. The additional items are derived from the Phase 1 themes with reference to the questionnaire used by Breen and Lindsay (1999). The additional items describe the aspects which are raised by the focus group interview participants but not mentioned in SPRIQ.

All Part 2 items and 25 out of the 30 Part 3 items are five-point Likert-scale items asking about frequency, with options ranging across 'never', 'rarely', 'sometimes', 'often' and 'always'. The five items related to Beliefs in Part 3 are agreement based, with options ranging across 'strongly disagree', 'disagree', 'neither disagree nor agree', 'agree' and 'strongly agree' (see Appendix C).

The whole questionnaire was developed in English first as the theories and materials (e.g. Healey, 2005; Visser-Wijnveen et al., 2016) were originally in English. Visser-Wijnveen et al. (2016) disclosed that items in SPRIQ were originally developed in Dutch. Items were translated into English and back-translated to Dutch, with minor adjustments made in the English translations before they published the entire article in English. The current questionnaire was then translated into Chinese for its administration in China by the researcher, who was a native Chinese with extensive postgraduate study experiences in the UK. To improve the credibility, back-translation to English was also carried out by the secondary school English teacher in China who back-translated the focus group interview discussion outline in Phase 1.

Before distributing the questionnaire to the respondents, a small number of pilot testing interviews were administered as another measure to ensure the credibility and internal validity of the questions (Garcia, 2011; Neuman, 2014). The participants included taught masters in business schools, undergraduates from other disciplines and PhDs in Education at the sampled universities, who would not take part in the main study survey. Because this study did not aim at developing a new questionnaire for generalised use, the main purpose of the pilot testing interviews was to check

whether the participants could clearly understand the questions without difficulty, ambiguity, or vagueness. Eight participants tested the English questionnaire individually in person, and six participants tested the Chinese version individually or in pairs via online video chats. In the testing interviews, the participants were first requested to complete the questionnaire draft as in a real survey with time calculated. Then, they were invited to talk about their overall feelings about the questionnaire. For example, were the questions difficult to understand, was it tiring to complete the whole questionnaire, and were the questions easy to answer? Next, the researcher and the participants went through the question items one by one. The participants explained what they were thinking about when they read each question and identified the difficult or ambiguous parts if applicable. Finally, additional advice was sought from the participants. While these pilot testing interviews were not audio recorded, the researcher took notes of their feedback and made corresponding revisions to improve the quality and rigour of the questionnaire.

In the translation (and back-translation) process and pilot testing interviews, all items were carefully reviewed. Some expressions and wordings were adapted based on the disciplinary context and discussion with the back-translation teacher and the piloting participants. For example, some terms used in Healey's (2005) nexus-type framework were too academic for undergraduate students such as 'research ethos', which was adapted to 'research culture'. The term 'research-teaching nexus' was not used when communicating with the participants throughout Phase 1 and Phase 2, but 'integrate research into teaching' or 'elements/activities of research in learning' etc. As another example, the expression of 'scientific research' in SPRIQ items was revised to 'research' in the English questionnaire. Interestingly, the literal translation of 'scientific research' into Chinese was 'Keyan', which exactly means research. During the pilot testing interviews in China, reviews were conducted with regard to the translated Chinese version, whereas sometimes the original English expressions of the items were also discussed because the students at the selected research-intensive universities were quite good at English.

3.6.3 Statistical data analysis: Phase 2 survey

Statistical analysis of the Phase 2 survey contains three parts, Exploratory Factor Analysis (EFA) of the experienced nexus types, EFA of the ways of nexus engagement, and standard multiple regression analysis of the relationships between the ways of nexus engagement and the nexus types.

The study chooses EFA to reveal the specific nexus types experienced by business school undergraduates at research-intensive universities in China and the UK (RQ1) and the ways students engage with the nexuses (RQ2). As suggested by Fabrigar, Wegener, MacCallum and Strahan (1999)

and Tabachnick and Fidell (2007), EFA is recommended for research that intends to identify the underlying construct of the observable variables. Before the choice of EFA, possible other analysis methods including Principal Components Analysis (PCA) and Confirmatory Factor Analysis (CFA) are evaluated and rejected.

PCA, while sometimes mistakenly considered as a subtype of EFA (Fabrigar et al., 1999), provides the best solution if the research looks for maximum reduction of the data, and does not look for any latent theory about *'which variables should be associated with which factors'* (Tabachnick and Fidell, 2007, p.610). The 'components' produced in PCA are empirical *'aggregates of correlated variables'* (Tabachnick and Fidell, 2007, p.610), not *'latent variables'* (Fabrigar et al., 1999, p.275). Clearly, the current study does not aim to extract a minimum number of nexus types or ways of nexus engagement, but identifies an optimal latent pattern from the variables describing the experienced nexus types and the ways of nexus engagement.

While this study employs the nexus theoretical framework by Healey (2005) and SPRIQ by Visser-Wijnveen et al. (2016), Phase 1 data analysis results suggest that it might be inappropriate to conduct CFA with any hypothesised factor structure. For example, there is an additional nexus type proposed from Phase 1, Extra-curricular Integration. Student experiences also display different hybrids of Healey's (2005) four nexus types. With such context-specific discoveries, existing theoretical or empirical evidence does not provide a strong basis to make assumptions. Testing on a particular hypothesised factor structure would potentially omit many other possibilities. The results from CFA might conceal or misinterpret some aspects of the nexus types experienced by the students and the ways of nexus engagement. Therefore, the study chooses EFA, the more data-driven approach, to provide a more accurate description of the student experiences in China and the UK.

Regression analyses are widely applied in analysing relationships between one dependent variable and several independent variables (Tabachnick and Fidell, 2007). As the scholars suggested, regression analyses allow correlations among the independent variables and correlations between the independent variables and the dependent variable to different degrees. Thus, regression analyses are particularly helpful in analysing complex real-world problems which are like the topics of this study.

3.7 Trustworthiness and rigour of the research

To enhance the trustworthiness and rigour, this study follows the four constructs of trustworthiness outlined by Guba (1981) and utilises approach-specific criteria for data analysis across different research phases. Because a mixed-methods approach is employed in this study, in which both qualitative and quantitative elements are integrated, the comparisons of aspects of trustworthiness are illustrated as follows. Guba (1981) suggested four dimensions constituting trustworthiness: ‘*truth value*’ (p.79), applicability, consistency and neutrality. As summarised in Table 3.3, the criterion of truth value is linked with credibility in qualitative research, corresponding with internal validity in quantitative research. Applicability is related to transferability in qualitative research and external validity or generalisability in quantitative research. Consistency measures dependability in qualitative studies and reliability in quantitative studies. Finally, neutrality indicates confirmability and objectivity in qualitative and quantitative research respectively. While Guba (1981) and Krefting (1991) acknowledged that the four dimensions of trustworthiness can be related to both qualitative and quantitative research for its balance of rigour and relevance, the concept of ‘trustworthiness’ originated from the naturalistic inquiry paradigm and is more commonly used in qualitative research.

Table 3.3 Comparisons of aspects of trustworthiness in qualitative and quantitative approaches (adapted from Guba (1981) and Krefting (1991))

Aspects of trustworthiness	Qualitative approach	Quantitative approach
Truth value	Credibility	Internal validity
Consistency	Dependability	Reliability
Applicability	Transferability	External validity/Generalisability
Neutrality	Confirmability	Objectivity

Truth value: Credibility and internal validity

This study optimises its truth value through the use of triangulation as this is one of the effective ways to improve the credibility of a study (Denzin, 1978; Guba, 1981; Krefting, 1991; Creswell, 2009 & 2014; Cohen et al., 2011; Punch and Oancea, 2014; Coe, 2017). This study triangulates the collection methods, types and sources, and analysis methods of data. For example, evidence from both focus group interviews and the survey are corroborated to illustrate undergraduate

experiences of the research-teaching nexus and the ways of nexus engagement in business schools at research-intensive universities from China and the UK. Involving students across different academic years also helps provide different participant perspectives for authenticity.

Regarding the qualitative phase, credibility was enhanced through detailed descriptions and rich data (Creswell 2009; Coe, 2017). For example, the thick description of the contexts, participants and interview processes helped contribute to higher credibility. Besides, clarification of potential bias is considered particularly important for ensuring credibility in qualitative approach research (Creswell, 2009). This will be further explained in the later paragraphs demonstrating the neutrality issue.

Regarding the quantitative phase, several pilot interviews were implemented before distributing the questionnaire to the respondents. This helped improve the content validity. However, as Creswell (2009) and Hedges (2017) demonstrated, the non-random selection process of respondents might bring threats to internal validity due to the potential influence of bias.

Consistency: Dependability and reliability

In the qualitative phases, member checking was employed to improve the dependability of the themes that were extracted (Krefting, 1991; Creswell, 2009). While the researcher carefully examined every transcript, several transcripts were randomly picked and further examined by another friend who was independent of the research to correct possible mistakes. Meanwhile, the consistency of code definitions is crucial in dependability (Elliot, 2018). The interviews conducted in Chinese were coded and conducted thematic analysis in Chinese. Within the specific language and cultural background, the understanding of the participants' input would be more accurate and true meanings were less likely to be lost in the process of translation. The themes and quotes were translated into English for interpretation.

In the quantitative phase, the internal consistency of the scales was measured by Cronbach's alpha, McDonald's omega and Guttman's lambdas scores. It is worth noting that scholars have different opinions on whether internal consistency belongs to reliability or validity of the research. For example, Coe (2017, p.45) insisted that internal consistency should be considered as an aspect of validity because it measures '*the extent to which items in a test measure a common, unidimensional construct*'. Other scholars like Carmines and Zeller (1979), Muijs (2011), Creswell (2012) and Punch and Oancea (2014) regarded internal consistency as a type of reliability. This study adopts the latter view. As Price, Jhangiani and Chiang (2015) suggested, reliability is related to different types of consistency, including consistency over time, across items and across different researchers. The internal consistency indicates the degree of item homogeneity, and therefore it belongs to the 'across-item consistency' type of reliability. The same questionnaire was distributed across the four

selected universities in China and the UK, to ensure the standardisation of procedural administration (Creswell, 2012). Furthermore, while the researcher translated the questionnaire into Chinese, the secondary school English teacher helped back translates the Chinese questionnaire into English to ensure reliability.

Applicability: Transferability and generalisability

This study presents student experiences of the research-teaching nexus and nexus engagement with a particular focus: undergraduates within business schools at research-intensive universities in China and the UK. The study does not intend to generalise its finding. Nevertheless, as suggested by Geertz (1973), Guba (1981) and Lincoln and Guba (1985), transfer can be initiated with detailed descriptions of the contexts and empirical evidence. The scholars indicated that researchers do not necessarily need to justify the degree of transferability of the research on their own, but need to provide a database with rich details to enable others to decide to what extent the findings can be transferred to their contexts. From this point of view, the thick description of the university selection and participant recruitment process, as well as direct quotations from the focus group interview participants are the strategies helping enhance the transferability of the study. In addition, the integration of the quantitative approach has further contributed to transferability. Given the large number of survey respondents and their various demographic backgrounds, the findings of this study can be referred to for those similar settings where conditions are '*fit*' (Guba, 1981, p.81), such as business schools from other Double First Class universities in China or Russell Group universities in the UK.

Neutrality: Confirmability and objectivity

Many scholars including Hellawell (2006) and Bourke (2014) have indicated the importance of demonstrating the researcher positioning in clarifying influence and potential bias in the research processes. Being part of reflexivity, which is considered '*a continuing mode of self-analysis*' (Callaway, 1992, p.33), the researcher positioning of 'insider' and 'outsider' will be illustrated and analysed.

The researcher is Chinese, and was born and raised in China. Upon finishing undergraduate study in Economics at a research-intensive university in China, the researcher came to the UK and acquired two master's degrees in Management and Education at research-intensive universities. Before being a current PhD candidate in Education, the researcher also had a few years of work experience in different education settings including as an MBA administrative staff at a research-intensive university in China.

It can be seen that the researcher has extensive study and work experience in the Chinese and British higher education contexts, especially in business schools at research-intensive universities. This makes the researcher an insider to the research. As Robson (2002) suggested, in addition to the convenience of getting access to the participants, being an insider is also helpful in facilitating the research with the researcher's knowledge about the selected contexts. In the current research, the researcher's personal contacts, which are accumulated from the experiences above, have greatly contributed to contacting potential selected universities and gatekeepers and possibly have helped increase the response rate. The insider experiences help the researcher build up trust and closeness with the focus group participants, encouraging more open and thoughtful discussion. The researcher's own knowledge and concerns of the research-teaching nexus also motivate the research journey. However, Robson (2002) warns that an insider position could raise difficulties with confidentiality, power relationships and bias. For example, if the researcher approaches the participating students as a friend of a gatekeeper, and the gatekeeper is usually an academic or administrative staff who is considered to possess more power or authority than the students, the students might regard the researcher as an authority as well. They might feel difficult to refuse participation or give more positive feedback intentionally. Moreover, as part of contextual knowledge, the researcher's own experiences of the research-teaching nexus might be unconsciously reflected in the research process through data collection (e.g. the interview discussion outline and the questionnaire design) and data interpretation, which might result in potential research bias.

The researcher can be considered an outsider at the same time. This is because the researcher graduated from the undergraduate programme more than 10 years ago and has changed her research interests to the Education area. Within today's increasingly fast-changing higher education contexts, the researcher's contextual knowledge about undergraduate business schools might not be up to date. Besides, the final recruited business schools and universities might not be those departments or institutions the researcher studied in. While these facts can help mitigate the influence brought by the insider position and enhance the confirmability of the study, they have formed challenges to getting sufficient responses in the data collection process.

In addition, Guba (1981) pointed out that data and interpretation confirmability constitute important aspects of neutrality as well. The same as credibility enhancement, triangulation is an effective way of improving the confirmability of the research.

3.8 Ethical considerations

3.8.1 Compliance with the ethics regulations

Illustrated by Hammersley (2017), research ethics indicates '*all of the values that ought to inform the work of researchers*' (p.58), in which the values include both epistemic and practical values. This study strictly complied with the Policy on the Ethical Conduct of Research and Studies involving Human Participants of the University of Southampton (UoS, 2012) and the Ethical Guidelines for Educational Research of the British Educational Research Association (BERA, 2011). Although written regulations on research ethics were not as explicit in China, this study took exactly the same ethical standards for the research work completed in China and the UK. The study acquired ERGO approval at the University of Southampton in October 2018 and started data collection upon formal ethical approval. Specifically, the following issues were carefully considered and addressed.

First, participation in any phase of this study was voluntary. Before being asked for their consent to participate, the participants were fully informed of who the researcher was, what were the purposes and processes of the research, and to what extent they would participate in the research via the Participant Information Sheet. With sufficient knowledge about the research and the researcher, the participants had full autonomy to decide whether to take part in the study and how many phases they would like to participate in. A consent form was provided to the participants who partook in the focus group interviews in Phase 1. For survey respondents in Phase 2, the first question and also the only compulsory question was asking for their consent to participate. The survey proceeded only when they clicked the consent box.

When the participants agreed to participate in or actually started the interview or survey, they could withdraw without their rights being affected. For Phase 1 focus group interview participants, they could withdraw at any time before the submission of the thesis. For Phase 2 survey respondents, they could withdraw before they submitted the answers in the online survey system or before they gave back the hard copy questionnaires to the researcher where applicable. They could not withdraw upon submission because the questionnaires were completed anonymously and individual answers could not be traced.

Second, confidentiality and privacy issues were greatly valued in the research. The chosen universities were anonymised with coded names. With a very general description, considering the total number of 36 Double First Class (Category-A) universities in China and 24 Russell Group universities in the UK, their identities could hardly be recognised.

For the survey, it was anonymous and respondents filled in the questionnaire online or on hard copies independently and securely. It would not be possible to match the answers with individual participants. Besides, only aggregated data were used for statistical analysis. No individual answers were analysed. For the focus group interviews, while the participants could not be completely anonymous, the majority of the data analysis was based on themes extracted from the discussion. A small number of individual answers were quoted with coded focus groups mentioned only. Participant identities would not be discovered. In the interviews, the researcher also suggested the participants keep the participant identities and discussion content confidential.

All the data were collected only for academic purposes and only used in this research. They were stored in a password-protected laptop, and will be deleted after the research finishes. All the information was treated as confidential and was not shared with anyone else except for the supervisors and the transcripts cross-check mate.

Third, potential risks for different stakeholders and mitigation measures have been carefully considered. For example, the chosen universities and participating students might experience anxiety about possible identity recognition, especially when some negative opinions or evaluations were revealed. In this case, the measures ensuring anonymity and confidentiality were reinforced to the universities and students. If they felt overly distressed, they had the right to withdraw from the study.

3.8.2 Ethics beyond the policies – cultural factors and wider responsibilities

Regarding the voluntary participation issues, while accessing the students through the gatekeepers was ethically requested and could be convenient for data collection, it might have a slightly adverse impact on students' autonomy. In particular, in the Chinese context where traditional Confucian values of respecting and obeying seniors and superiors were highly advocated, the students might feel they have to participate just because the teaching or administrative staff introduced the research. This could also happen at universities in the UK, especially if the gatekeepers are the students' lecturers or someone who has an influence on student assessment. To address this issue, the researcher tried to avoid direct contact with the administrators and academic staff in front of the students, and accessed the students as a fellow student. The principle of voluntary participation and the right to withdraw were highlighted to the students.

In the focus group interviews, some participants might have fewer opportunities or feel embarrassed to express their ideas. Related reading and practising with friends helped the researcher to gain interviewing techniques. The researcher was able to manage the interview

process and make sure that every participant was effectively engaged in the participation with satisfaction.

Additionally, as suggested by both BERA guidelines (2011) and Hammersley (2017), researchers have the responsibility of communicating and disseminating the research findings as a contribution to the academia, policy-making authorities, and the whole wider society. In this study, to express thanks to the chosen university and participating students, a summary report of research findings will be sent to them upon request. The researcher will also look for opportunities to present at academic conferences and to publish in peer-reviewed journals, encouraging comments and discussion to illuminate further research directions and improve the influence of the research topic.

Chapter 4 Phase 1 Thematic analysis findings

4.1 Introduction

This chapter presents the thematic analysis findings based on Phase 1 focus group interviews. In Section 4.2, themes and their stories behind regarding the experienced research-teaching nexus types are presented, responding to RQ1: What types of research-teaching nexus do business school undergraduate students experience at research-intensive universities in China and the UK? In Section 4.3, themes and detailed illustrations of the ways how students engage with the nexuses are provided, responding to RQ2: How do business school undergraduates engage with the research-teaching nexuses that they experience at research-intensive universities in China and the UK? Section 4.4 explains how these thematic analysis findings inform the questionnaire design, which enables the proceeding of the Phase 2 survey.

As a reminder, there were six focus groups with 42 participants in China and 12 focus groups with 38 participants in the UK (see Table 3.2 in Section 3.5). All the participants were undertaking EFAM related programmes. Particularly, participants from China covered all the academic years, whereas no first-year students from the UK partook in the focus group interviews. The themes are derived from both deductive and inductive coding processes (as described in Section 3.6.1). While the thematic analysis was conducted on each transcript and transcripts from China and the UK were regarded as separate datasets, the overarching themes were the same across countries. Therefore, the interpretation of the findings is structured upon themes instead of countries. Within each theme, differences between the countries will be presented where applicable. Quotations from the participants are anonymised with coded group names. For example, the second focus group from the university CN1 is coded as CNFG1-2, and the fifth focus group from the university UK2 is coded as UKFG2-5.

4.2 Nexus types experienced in China and the UK

For Section 4.2.1 to Section 4.2.4, the overarching themes and sub-themes are decided by the concepts from Healey's (2005) nexus framework, demonstrating the deductive or theoretical approach of thematic analysis (Braun and Clarke, 2006). In the above mentioned sections, specific attention is paid to identifying to what extent Healey's (2005) nexus types exist in the experiences of business school undergraduates at research-intensive universities in China and the UK. For Section

4.2.5, codes primarily emerged from the data and themes are extracted following an inductive approach. In this bottom-up analysing process, an additional nexus type is specified outside Healey's (2005) framework, which is Extra-curricular Integration.

4.2.1 Research-led Teaching

Guided by Healey's (2005) illustration, Research-led Teaching encompassed sub-themes of 'teaching focuses on information transmission', 'research findings are focused', 'subject content based integration', and 'lecturers' research interests led integration'.

Reading academic research publications like journal articles appeared to be the most common activity of Research-led Teaching experiences across countries. In China, most research-related reading was reported to be conducted when they completed essay-based module assignments, in which appropriate references were required. The topics of the reading materials were closely related to the module content. In the UK, in addition to referencing-based reading, it was quite common that lecturers would assign several journal articles or book chapters as additional reading complementing the lectures. For most occasions, the extra reading focused on research findings, especially for students from lower academic years. As shared by a participant:

[A lecturer's name] told us to skip the methodology part [in the assigned additional reading] because [it would be] too difficult for us right now. (UKFG2-2)

Nevertheless, sometimes the students were expected to understand more aspects of research from the additional reading, including the research process. For example, a participant mentioned that:

We read a lot of empirical studies. And sometimes there's presentation and discussion of the papers. With tutors or just among us...We are asked to analyse and criticise [the content]... (prompted by the researcher) Yes, including the methodology section. (UKFG2-4)

The additional reading was usually optional. Sometimes, there was discussion on the assigned articles guided by lecturers or tutors as reflected above. More likely, lecturers would not talk about these articles and it was totally the students' choice to read or not. Among the participants from the UK, different actions and attitudes towards the additional reading were spotted. A few students suggested that they almost never read the assigned reading materials. Some students would pick the titles or topics that they were interested in to read. Some students read the materials that would be discussed or used for group presentations. 'Too much (reading amount)' and 'not enough time' were mentioned the most for the reasons why they did not finish the additional reading. 'Boring' and 'not

interested' were also relatively frequently mentioned. Sometimes the reading content were probably too challenging for undergraduate students. A participant from UK1 stated:

Extra reading of [module name] is massive. Everything is like hundreds of pages (exaggerated)...Too much methodology and philosophy stuff. I can't [finish reading]... (UKFG1-3)

Meanwhile, lecturers integrated their own research interests or outputs into teaching in different ways. For both countries, lecturers were likely to mention their related research projects in explaining curriculum knowledge. For example,

Our lecturer in [module name, related to data analysis] often 'bragged' about his research project during the lecture. Don't misinterpret my words. I really like the lecturer and his 'bragging'. When he talked about how he dealt with the [data analysis] problems in his own project, I felt the theories came alive and they were indeed practical. (CNFG1-1)

Lecturers' publications were used in teaching at different levels. Sometimes lecturers' publications were listed in the additional reading list or suggested to be referenced in assignments. In China, some lecturers asked students to use their publications as textbooks, whereas this was not mentioned in the UK.

In general, business school undergraduate students at research-intensive universities in China and the UK were quite familiar with elements from Research-led Teaching (Healey, 2005). Despite the complaint over the reading workload, most participants considered activities of Research-led Teaching as helpful as 'windows' (UKFG1-1). By extending the curriculum knowledge a bit more, the students could understand modular knowledge from more perspectives and know more about up-to-date disciplinary research. Relatively boring but less challenging, Research-led Teaching provided basic knowledge about research, and tended to be like opening the door to research for undergraduate students. As a student from CN1 suggested:

I learned what academic papers are like by reading my lecturer's article in an sci journal. (CNFG 1-1)

4.2.2 Research-oriented Teaching

For Research-oriented Teaching (Healey, 2005), sub-themes included 'teaching emphasises understanding the research process', 'research methods are taught', 'research techniques and skills are taught', and 'teaching promotes a research ethos'.

When asked about did they notice any elements of research being integrated into teaching within EFAM modules, many UK participants first replied with the modules that taught research methods. For example, participants from the two selected universities in the UK responded:

[A research methods module name]. Definitely. It has 'research methods' in the title.
(UKFG1-1)

- [A research methods module name]. The first thing coming into my mind.
- Me too. I immediately think of that. (A conversation from UKFG2-2)

In the UK, research methods modules taught students about general or particular research methods and approaches in the disciplinary areas of EFAM. Related techniques of data analysis and software usage were also included. In the learning process, usually students were able to carry out data analysis based on secondary or made-up data provided by lecturers. Thus, they gained basic knowledge about qualitative or quantitative or both research designs and research methods, practised data analysing skills, and understood more about the research process. As reported by a participant from UK1 excitedly:

Very helpful!! [laughed] I still use [research methods module] slides today. I think I've used them in many assignments. (UKFG1-3)

In China, by contrast, specific research methods modules were not that common among undergraduate experiences at business schools. At CN1, only a Year 4 participant (CNFG1-1) reported an optional research methods module which was available across social discipline programmes. Other participants in the focus group displayed great interest in that module, too. At CN2, only one focus group (CNFG2-2) mentioned research methods sessions. More frequently, participants from China experienced Research-oriented Teaching elements scattered from different modules, in which data analysis was related. Particularly, compared to the UK participants who were able to choose between qualitative or quantitative methods or could study both, participants in China especially those from economics and finance related modules tended to receive knowledge and training solely focusing on quantitative methods.

Slight negative opinions were also heard towards Research-oriented Teaching experiences, mainly about difficulty and practicality. For example,

I feel the quantitative data analysis in [module name] is too difficult for me. I studied Liberal Arts in high school⁵, so I feel a gap [between the module requirement and my mathematical capabilities]. (CNFG1-3)

I've learned more from the dissertation process, [but] not that much from [research methods module name]...(prompted by the researcher) Because [research methods module name] was a bit technical, and...I can't explain clearly, [and] just don't remember much [from the module]. (UKFG2-3)

I don't really think [research methods module name] is research...Maybe they are related, but we don't have opportunities to practice it. (UKFG2-2)

With distinguishable features, Research-oriented Teaching was easily recognised from the experiences of business school undergraduates. From the perspective of students, Research-oriented Teaching appeared to be the most explicit nexus type that integrated research into teaching. Particularly, in the UK, some related module content were about how to conduct research. Most participants from both countries (especially in the UK) thought highly of their Research-oriented Teaching experiences. They perceived the learned research methods and skills to be useful and practical across different modules in their undergraduate study, including dissertations. Experiences of Research-oriented Teaching were also considered a preparation for their potential postgraduate study.

4.2.3 Research-based Teaching

In Research-based Teaching (Healey, 2005), sub-themes included 'teaching incorporates inquiry-based activities', 'student-centred teaching/learning', 'students as researchers', and 'diminishing gaps between the roles of lecturers and students'.

The participants shared various forms of Research-based Teaching activities from their experiences. The dissertation was a typical example of Research-based Teaching experiences for final-year students across countries. Notably, a dissertation was compulsory for all programmes at the selected business schools in China, whereas different dissertation requirements were reported at UK2. Across the business school programmes at UK2, dissertations could be compulsory, optional, or not

⁵ In China, students in senior years at secondary education (approximately equivalent to Year 11 in the UK) are diverted in to a Liberal Arts or Sciences pathway, and will take corresponding subjects in NCEE about two years later. For example, after students choose a Liberal Arts pathway, they do not study physics, chemistry, or biology. Mathematics is still compulsory, but is more basic than mathematics in Sciences pathway.

available at all. Many participants who had started or finished dissertations perceived dissertation completion as a special experience at university, as illustrated by the participants:

- [Completing the dissertation is] Like the final boss fight.
- Yeah. Sometimes it feels like...I can't do it. I don't want it. I hate essays [dissertations]. But when it's finished, [I feel] my university life is not completed without the dissertation. (A conversation from UKFG1-3)

Also, a participant from CN2 shared his/her dissertation experience as follows:

Some of my classmates have participated in extra-curricular research projects before, but personally, this [the dissertation] is my first time engaging with a proper academic article. Although I have just finished the research proposal so far, I feel it is very different from our day-to-day teaching and learning. I look forward to experiencing the whole process of dissertation completion. (CNFG2-1)

At UK2, some Year 2 students from the programmes with dissertations as an optional module expressed strong intentions to undertake dissertations:

I know it [the dissertation] must be challenging, but I really want to take it. It's necessary. You'll need to write a dissertation or something anyway. It's helpful and rewarding. (UKFG2-5)

As quoted above, 'challenging', 'helpful' and 'rewarding' represented the mainstream student opinions about completing a dissertation in undergraduate study. Nevertheless, a small number of participants at UK2 did not plan to undertake a dissertation. Besides different career plans, students tended to be more unsure about the processes and results of completing a dissertation. As explained by another participant from UKFG2-5:

I don't think I'll take the dissertation module. Because of time allocation, and...unknown risks? I'm more confident in exams. (UKFG2-5)

In addition to dissertations, different inquiry-based activities were introduced by the participants. For example, case studies based on real-world enterprises were frequently mentioned by participants (especially from management related modules) in both countries. Usually, based on core theories within textbooks and supplementary journal articles, students were guided to investigate the cases individually or in groups. Written reports or group presentations were often required. Sometimes, students needed to collect further data by themselves. In the process, they

would also need to evaluate the reliability of different data sources and make their decisions. As introduced by a participant:

In my [module name] business report, I used some data I googled. Even with references, the teacher highlighted those data and said 'are you sure?'. (UKFG1-2)

A unique video challenge fieldwork task was shared by a participant in the UK:

We had a video challenge in [module name]. We were in groups to visit the city, [and] took pictures of the historical sites. The buildings need to have some links with Economics. (UKFG2-6)

A simulation of real-world practice was also mentioned by participants in both China and the UK. For example,

We had a simulated game when we learned game theory, [which was] allocating money based. (CNFG1-3)

I heard from students from senior years that they had a stock market simulator app in [module name]. I don't know whether we're going to have it, too. (CNFG1-3)

There was a very interesting game about simulating investment... We were in different groups, [and] invested in different projects with coins. Some groups earned a lot and some were in debt [laugh]. I was in the winning team. We did a great job in making investment decisions. (UKFG2-3)

In [module name], the assessment was an interview simulation. (UKFG2-6)

At CN1, several participants from CNFG1-1 and CNFG1-3 attended the same module and shared the same experience of Research-based Teaching: replicating the process of a lecturer's own research project. As introduced by a participant:

In our programme, we have a lecturer who has a great interest in data collection and data analysis...I have deep memories of the assignment in which we were asked to calculate an [subject-specific] indicator. First, you'll need to collect trade data from different countries, world trade data, GDP data, GDP per capita data, different product classifications, and different criteria for the classification, and then categorise the data based on the criteria...And thousands of data...And you'll need to calculate with the data based on the [subject-specific] indicator formula...He has done it in his own research project. He thinks

we need to know the process and maybe he thinks this is interesting, so he would like us to try in the assignment. (CNFG1-3)

Additionally, a participant from CNFG1-3 mentioned that a module assignment was to compose a research proposal based on any topic from the module content. The written research proposal was compulsory, and an individual presentation of the proposal was optional and could get extra marks.

In terms of Research-based Teaching experiences, participants across countries expressed divergent opinions. Positive feedback was usually related to 'interesting', 'creative' and 'practical'. For example,

I like the sand table simulation. I didn't feel I was attending a lecture, but I've learned more beyond the theories in textbooks. (CNFG2-3)

Case study is fun. Very practical... I didn't know [a real-world enterprise] was in that much trouble [before the case study]. (UKFG1-2)

I appreciate it [a case study related assignment]. When you were actually doing it, you understood it better. (UKFG2-4)

On the contrary, negative feedback about Research-based Teaching was mainly from two aspects, difficulty and necessity. Regarding difficulty, participants found Research-based Teaching activities might be too challenging and too time-consuming. For example, the aforementioned assignment of replicating the lecturer's research project at CN1 seemed to be engraved into the students' memories because of its difficulty and workload. As mentioned by the participant:

We were already working in groups, but still couldn't get all the data needed. Too much data, and some data were nowhere to find. (CNFG1-1)

Similarly, as explained by a participant from UK2:

It's interesting in the lectures. But it's very time-consuming to prepare the materials before and after the lectures [when Research-based Teaching activities were incorporated].
(UKFG2-5)

In the UK, participants from the two universities also talked about the difficulty gaps across academic years. From their discussion, Year 1 and Year 2 tended to have less research-integrated teaching. The teaching content and assessment were largely based on curriculum knowledge. In Year 3, the research-teaching integration increased sharply in terms of reading intensity, diversified

classroom activities, and comprehensive or extended knowledge and skills required in assessments.

A participant from UK2 provided a very interesting metaphor:

I was like a paramecium in Year 1, and suddenly they [lecturers and the university] want me to become a human being in Year 3 without telling me how to walk. (UKFG2-5)

Meanwhile, some participants from both China and the UK considered that integrating too much in-depth research-related content was not necessary for their undergraduate study. The students expressed different levels of interest in research, different future (career or postgraduate) plans, and also different ideas about the concept of 'research-intensive universities'. For example,

I think the university treats us like researchers, too. They [the university] think all of us are going to postgraduate study. But I just want to find a job...I think our university is too academic, but I have no other choices. (CNFG1-1)

I didn't pay attention to [the notion of] 'research-intensive universities'. I applied [for this university] just because of its good ranking [in league tables]. (UKFG1-4)

[The research-teaching integration was] A bit overwhelming, especially in Year 3...I guess we don't use those research in our jobs next year right? (UKFG2-1)

At research-intensive universities, there were more quantities and higher qualities of research resources available for research-teaching integration. Also, the universities and the lecturers within might have put much effort into integrating the advantaged research resources with teaching. However, not all students at the institutions would like to take in such an amount and depth of research-teaching integration. 'Options' and 'choices' had been frequently mentioned by participants in both countries. Quotes about 'options' will also be presented in Section 4.3.6, about student Beliefs of the research-teaching nexus. More discussion about the argument over Research-based Teaching experiences will be provided in the Discussion Chapter.

4.2.4 Research-tutored Teaching

Regarding Research-tutored Teaching (Healey, 2005), sub-themes included 'group discussion about research findings' and 'tutorials or workshops about research findings'.

In-group tutorials or workshops were more common in the UK context, as usually a module was taught with both lectures and tutorials. While not all tutorials contained research-integrated content, participants from the UK still shared some experiences of group discussion and/or presentations of research findings from journal articles.

In China, there were only lectures and no tutorials for undergraduate teaching at the selected business schools. Nevertheless, a participant from CN1 introduced:

I have a [module name] related module. Each week the lecturer will leave one session for group discussion. And within each group, we choose one academic article among the postgraduate publications [to discuss]. (CNFG1-1)

Some other in-lecture research-related group discussion experiences were also reported by the participants in China. For example, with a given topic, students read literature and each student shared several articles within groups before lectures. Then, students discussed the shared literature in groups and did group presentations to other groups during the lectures (CNFG1-1). As introduced in CNFG2-3, many case studies were discussed in groups.

At the undergraduate level, although the concepts of 'tutorial' or 'tutoring' were more widely applied in the UK than in China, participants from both countries had experienced elements of Research-tutored Teaching.

4.2.5 Extra-curricular Integration

In the inductive coding process, a recurring code stood out, which was 'extra-curricular research-related activities'. Participants from both countries shared their experiences or noticed opportunities for extra-curricular research-teaching integration. For example, participants across countries noticed or attended research seminars and/or academic conferences held within business schools or at universities.

Notably, participants from China reported many more extra-curricular research-related opportunities at the departmental or university level. At CN1, at least three research- or academic-based competitions or summer programmes were mentioned: a university-wide research project competition, a university-wide research-based summer programme, and an academic article based competition at the business school. The students shared various research-teaching integration experiences from these extra-curricular activities. Even several students from Year 1 displayed a great interest in and a clear understanding of these research-related opportunities. For example,

I plan to participate in the [research project competition name] Cup and the [research-based summer programme name]. I already have an agreement with my dormmates [to participate together]. (A Year 1 student from CNFG1-1)

Together with several classmates, we submitted a research proposal in the [research project competition name] Cup. We didn't proceed to the final stage...I heard [a lecturer's name]'s students were awarded. Their topic was a subordinate topic of [the lecturer's name]'s project, and their final article was extraordinary. (CNFG1-1)

[During the research-based summer programme] We went to a company, visited their production line, and talked to their managers...We composed a problem analysis report based on what we had seen at the company. (CNFG1-3)

Likewise, at least three university-wide research-related competitions were reported at CN2: a research project based competition, an entrepreneurship competition, and a research-based summer programme.

In addition, participants from China reported more extra-curricular opportunities or experiences of participating in lecturers' research projects, or projects of the postgraduates supervised by the lecturers. For example, some participants worked as research assistants, helping with data collection, data screening and sorting, and data analysis. Some participants co-authored academic articles with lecturers or lecturers' postgraduates. Some students even participated in drafting book chapters with lecturers as reported from CNFG2-3.

Contrastingly, only a handful of participants from the UK reported opportunities or experiences of extra-curricular research-based competitions, or co-working with lecturers. For example,

I had [filled in] a questionnaire given by my lecturer. Not the course feedback [form]. I'm not sure whether it's the lecturer's study or someone else[s] though. (UKFG2-4)

I submitted an academic paper to [an undergraduate conference name] Conference and it got accepted...(prompted by the researcher) Yes, I did it myself, individually. (UKFG1-5)

Based on the above findings, the study proposes an additional nexus type: Extra-curricular Integration. Extra-curricular Integration is defined as students learning about any aspects related to research from activities at universities but not within modules. The 'any aspects related to research' includes but is not limited to research findings, research processes and skills, and research ethos etc. While extra-curricular research-related activities such as research seminars and conferences have been mentioned in previous studies (e.g. Turner et al., 2008; Davidson and Lyons, 2018), they were discussed infused with those within curriculum research-teaching integration. The current study suggests Extra-curricular Integration be considered an independent nexus type, and detailed reasons are discussed in Section 6.2.1.1.

In general, participants across countries had reported Extra-curricular Integration experiences. Nevertheless, participants in China tended to have more researcher-like experiences or opportunities, and participants from the UK displayed more participant-like experiences.

4.2.6 Summary of nexus types experienced in China and the UK

As can be seen from the participant discussion, undergraduate students at the selected business schools in research-intensive universities from both countries had experienced elements from all of Healey's (2005) nexus types. In addition, a new nexus type of Extra-curricular Integration is proposed.

Besides the specific characteristics explained from the experiences of each nexus type, several issues are noteworthy at the general level. First, research-integrated teaching activities usually displayed features from several of Healey's (2005) nexus types. For example, the additional reading was mainly Research-led Teaching if only research findings were focused on and the methodology section was skipped (reported from UKFG2-2). However, when the methodology part was included and analysed (reported from UKFG2-4), the additional reading became a hybrid of Research-led Teaching and Research-oriented Teaching. As for the 'replicating the lecturer's research project' assignment mentioned by CNFG1-1 and CNFG1-3, it can be considered a hybrid of Research-oriented Teaching and Research-based Teaching. Moreover, dissertations contain elements from all four nexus types by Healey (2005).

Second, participants from lower academic years and from accounting-related programmes reported fewer research-teaching integration experiences in general. For the differences across academic years, junior students had fewer overall university experiences, especially for the Year 1 China participants as their focus group interviews took place at the end of Semester 1. Also, teaching was more tightly curriculum-based in Year 1 and Year 2 across countries. Those were the stages of building a foundation and accumulation of disciplinary knowledge and skills. For the slight differences mentioned among the programmes, it was likely partly because of the nature of the subject knowledge and more memorisation of accounting regulations was required. For another reason, it might be that many participants from accounting-related programmes displayed higher interest in employment and lower interest in research, and they did not notice or participate in the research-integrated activities. As a participant from UK2 mentioned:

I think we have more theory-based teaching so far. Not much research [integrated]. Or maybe it's just me [not noticing the integration]. (UKFG2-6)

Third, participants from both countries frequently raised the question of ‘options’ when they shared about experiences of different nexus types, particularly experiences of Research-based Teaching. For students with different interest areas, future plans, and intellectual development levels, some compulsory (especially in-depth) research-teaching integration experiences seem to be compelled and not very satisfying. More discussion will be presented in the Discussion Chapter.

4.3 The ways that students engage with the nexuses in China and the UK

Similar to the coding processes applied in looking for nexus types experienced by the participants, deductive coding was conducted first in the guidance of the six attributes from SPRIQ (Visser-Wijnveen et al., 2016), followed by inductive coding to identify emerging ideas that were not included in SPRIQ. Several sub-themes have emerged from the inductive approach, whereas they are still considered encompassed by the overarching themes from SPRIQ.

When the participants talked about their experiences of different nexus types, sometimes they also shared perceptions, attitudes, and evaluations of these experiences, which indicated how they engaged with the nexuses. Therefore, some findings in nexus engagement have overlaps with corresponding findings in the experienced nexus types as introduced in Section 4.2. In this section, while the overlapping findings are mentioned briefly, the emphasis is on presenting the aspects that are not revealed yet.

4.3.1 Reflect

Regarding Reflect, the sub-themes of ‘awareness of research findings’, ‘awareness of research methods and process’ and ‘awareness of research methodology’ come from the deductive coding process. ‘Understanding of the concept of research’ comes from the inductive coding process.

In terms of research findings, methods, process, and methodology, participants had gained related knowledge and awareness from their nexus experiences, especially from experiences of Research-led Teaching, Research-oriented Teaching (Healey, 2005) and Extra-curricular Integration as shown in Section 4.2.1, 4.2.2 and 4.2.5. This section does not go into detail with the above sub-themes, but highlights student understanding of ‘research’.

At the beginning of the focus group interviews, participants were invited to talk about how they understood the concept of ‘research’ in the business school context. It is important to identify how students understand and define ‘research’, because ‘what counts as research’ will bring different perceptions of their nexus experiences and engagement.

In each country, participants provided various interpretations of 'what does research mean', varying in width of scopes and depth of understanding. Very often, participants raised several specific research-related activities or elements in the research processes, such as 'studies that lecturers carried out'/'previously done studies', 'surveys and interviews'/'models', 'publications'/'the articles we read', 'collect data'/'data analysis' etc.

Meanwhile, some participants introduced their understanding of 'research' from a more general perspective, explaining what 'research' was about, the aims of conducting research, and some general patterns of research. For example,

The concept of research...using scientific measures to investigate the inner laws of objective matters...But research in business schools is different from research in natural science subjects. As social sciences, EFAM subjects need to take more human-related factors into consideration. [CNFG1-3]

[Research means] Looking for some pattern. [CNFG2-2]

[Research means] We find something in our daily lives, and develop it into a theory that can be commonly applied, and also prove it. (CNFG2-3)

[Research means] Looking for answers to the questions you wanna know...Dig out some new directions. (UKFG1-3)

[Research means] Finding out more information about a certain area, backed by statistics to do with a certain topic...Also look at what's already been done in that area. (UKFG2-3)

[Research is to] Find something in common from the practical and the realistic world, and try to draw some conclusions. (UKFG2-7)

Several aspects stood out from the general understanding of 'research' by students. First, the words 'find out' or 'look for' indicated the inquiry spirit of research (Truscot, 1951). Second, participants were aware that research focused on 'specific areas', which implied in-depth investigation. Third, participants highlighted research in business schools was mostly based on real-world practice.

The participants also displayed an understanding of the disciplinary differences in research, even differences within the same disciplinary area, as seen from the discussion at CN1:

- I think research in business schools is more based on a common phenomenon in real life, some phenomena that are closely related to our behaviours. And we try to interpret these vague or difficult-to-describe phenomena with data, or use quantitative

languages to interpret and express the phenomena. Based on this, via the transferring process, we can proceed with the data in-depth. In the data proceeding process, we can find out a common pattern that is drawn from particular activities to general rules.

- I disagree that research in business schools is all from particular activities to general rules. I think it's more about from general rules to general rules, especially in our Economics. Even in Economics, there are theoretical economics and applied economics. (A conversation from CNFG1-1)

Some participants (most likely from senior academic years) interpreted 'research' with a relatively complete research process:

Like mentioned by that participant, mainly we need to observe the objective matters that already exist, and use our mathematical analysis methods and economics models to analyse, and get some conclusions. And we can verify the analyses and results by applying the conclusions to another similar matter. (CNFG1-1)

Research is like something you need to dig into, to find the relations, to find how it works, and what it will be in the future. Or maybe you can just try to figure out what it is, so that you can like give something maybe in writing, or maybe oral speaking or something that you can express to tell people your discovery and how it impacts on the people or something that you want to know (UKFG1-2).

You'll first figure out a topic, and go collect data, analyse the data, discuss about your analysis with materials. And there's [a] summary. [UKFG2-3]

Particularly, a few participants illustrated 'research' from the perspective of the relationship between research and learning:

Research is also [about] learning styles. Because when you research you're learning. (UKFG1-2)

I think research can be understood together with learning. Learning is more about what is already known. Research is about developing what is already known, [an] in-depth understanding of the already known, and to go beyond [to explore] the unknown. (UKFG1-5)

During the focus group interviews, it was noticed when the participants were asked 'what does research mean', usually there was some silence for a couple of seconds. It might be because this was

the first question in the formal discussion, and students were still in the 'warm-up' status. More likely, the question itself was somehow difficult for the participants. For one reason, it was broad and general. The students did not know where to start to answer the question. For another reason, even though 'research' was usually in the everyday vocabulary at university, the students did not think about its meaning or did not clearly understand the concept. A few participants gave up on this question, as they tried but still found it difficult to interpret appropriately. The specific research elements or activities raised by the participants also indicated that many undergraduate students tended to have an ambiguous or fragmented understanding of the notion of 'research'. They might be exposed to specific research activities or learning knowledge about different aspects of research, but lacked a holistic picture of 'research'. Nevertheless, there were still a considerable number of participants displaying a more comprehensive and inclusive understanding of 'research'. Particularly, the researcher personally considered the interpretation with the relationship between 'research' and 'learning' was brilliant. The student understanding of 'research' was influenced by their research-teaching nexus experiences. For example, the quoted participant from UKFG2-3 who explained the whole research process, was about to finish the dissertation. The other way around, meanwhile, student understanding of 'research' would also influence their perceived experiences and engagement of the nexus, because their understanding of 'research' was the lens for their views of the nexus experiences and engagement.

4.3.2 Current Research

Current Research includes sub-themes of 'awareness of lecturers' research', 'awareness of research in the disciplines', and 'teaching links with current disciplinary research practice'.

Similar to the sub-themes of Reflect in SPRIQ, student awareness of disciplinary research (conducted by either their lecturers or other researchers) and links with up-to-date research practice were introduced in student experiences of different nexus types as presented in Section 4.2. In this section, additional findings about differences in assimilation with lecturers' research between China and the UK are introduced.

While lecturers from both countries were likely to mention their own research projects or publications in lectures (see Section 4.2.1), participants in China tended to have more opportunities to assimilate with the lecturers' research. For example, some lecturers shared topics or data from their research projects when they supervised student dissertations:

I didn't know what to write for my dissertation until my supervisor showed me his research projects and told me I could pick one topic [from his research projects]...He said I could use his data as well. (CNFG1-3)

Another example would be found within the quotations from CNFG1-1, when the participant talked about experiences of participating in the university-wide research-based competition. As introduced by the participant, the awarded student project was about a subordinate topic of their supervisors' research project topic (as presented in Section 4.2.5).

Also, lecturers in China would recruit research assistants among the undergraduates, and disseminate the recruiting messages with general descriptions of their research projects:

Our student representative forwarded a message in our WeChat class group that our [module name] lecturer wanted to recruit two research assistants for his ongoing research project...There was a short description of what the project was about, and the lecturer emphasised that it was a provincial key project. (CNFG2-1)

In comparison, most participants from the UK only mentioned getting to know some information about lecturers' research during the lectures, reading lecturers' publications in the additional reading, or referencing lecturers' publications in essays. For example,

Our lecturers sometimes mention their publications, and sometimes recommend us to read for an extension...I referenced a lecturer's article in [my] dissertation. (UKFG1-5)

[A lecturer's name] is cute. He suggests we reference his paper in the assignment. (UKFG2-2)

Meanwhile, participants from UKFG1-1 and UKFG2-6 clearly stated their lecturers did mention their research in lectures but 'not much'.

In general, participants in China indicated some closer relationships with lecturers' research than participants in the UK, both within and outside modules. It was 'some' closer relationships, because the closer relationships mainly happened with the 'research-active' students or students with overall higher academic capabilities ('the good students'). Nevertheless, in the UK, even 'the good students' did not seem to have much contact with lecturers' research. For within curriculum integration, the degree of assimilation with lecturers' research was likely to be decided by the relevance of lecturers' research to the module content. For extra-curricular integration, to what extent students could get in contact with lecturers' research was largely based on the personal choices of academic staff. Awareness of lecturers' research is also closely related to Participation, which is further explained in

the following section. More discussion about awareness of and participation in lecturers' research will be presented in the Discussion Chapter.

4.3.3 Participation

Participation includes sub-themes of 'student participation in research', 'student participation being valued', 'student research activities contributing to discipline', and 'students feel being involved in research'.

For within curriculum research-teaching integration, participants from both countries gained opportunities to participate in research-related activities mainly from experiences of Research-based Teaching (Healey, 2005). For example, participants who undertook dissertations would conduct an independent research project under supervision. Specifically, some participants from the UK mentioned that they collected first-hand data in dissertation⁶. Some participants also participated in peer students' dissertation projects by attending interviews or filling in questionnaires. For example,

I did a survey in my dissertation. It was a bit difficult to get enough people to complete my questionnaire...Eventually it was fine. (UKFG1-2)

I did secondary data analysis for my own [dissertation] project, but I did [attended] a few interviews with my friends. Their [dissertation] projects had interviews. (UKFG1-3)

For Extra-curricular Integration, as presented in Section 4.2.5, participants in China introduced more in-depth participation in research-related activities, whereas participants in the UK tended to be more involvement-like in research. For example, regarding lecturers' research, participants from both CN1 and CN2 reported opportunities to become research assistants. In the roles of research assistants, students were able to participate in data collection, data analysis, and co-authoring etc. There were also more undergraduate research opportunities provided within business schools or at universities, such as those research-based competitions and summer programmes. A participant (CNFG1-2) mentioned that a dormmate (also a classmate) had published an article as the first author in Year 3, based on his/her research-based summer programme experiences. In the process, the China participants also acted as (co-)researchers. By contrast, participants in the UK were more likely to be the 'audience' of the research conducted by lecturers or other researchers. For instance, the

⁶ When the focus group interviews were conducted in the UK, final year participants had approached the end of dissertation or had already finished dissertation. Final year participants in China were at the beginning phase of dissertation, such as submitting research proposal or literature review.

UK participants attended research seminars or keynotes held in business schools or at universities. While there might be some discussion or debates in the seminars as suggested in UKFG2-1, the depth of participation in research was limited. A few participants expressed that when they tried to partake in research projects as researchers, they found that there were not many opportunities available, or opportunities they could easily access. As explained by the participant who submitted an academic article to an undergraduate conference from UKFG1-5 and a Chinese participant from UKFG2-5:

At first, I was trying to present [the article] at our university, but I couldn't find proper opportunities. (UKFG1-5)

I spoke to my friends in China, and they had more [extra-curricular] research opportunities than us. They had many kinds of research competitions. (UKFG2-5)

Additionally, a participant came from a 2+2 joint bachelor's programme. In the joint programme, students spent the first two years at a university in China and the last two years at a university in the UK. The bachelor's degree would be awarded by both the Chinese university and the UK university. With undergraduate experiences from both countries, the participant said:

[In terms of Extra-curricular Integration activities] I feel there's no big difference between my Chinese university, [which is] not that research-intensive, and the university here, a research-intensive university. (UKFG1-1)

While the above different stories about Extra-curricular Integration might have indicated students' different feelings of involvement in research, regarding perceptions of their research participation being valued and their contributions to the disciplines, participants' answers rarely directly reflected on these sub-themes from SPRIQ. Possibly, a response from a participant at CN2 touched upon the perceived recognition of their participation in lecturers' research:

The lecturer was very happy with our work [as research assistants]. He/she invited us to apply for his/her postgraduates. (CNFG2-1)

4.3.4 Quality

Quality includes sub-themes of 'lecturers' instruction and explanation of module content', 'lecturers' teaching styles', 'lecturers' feedback and support', 'difficulty and workload of module tasks' and 'relevancy and practicality of the research content'.

Regarding 'lecturers' instruction and explanation of module content', while participants in China rarely provided direct responses, two focus groups in the UK raised the question of whether good researchers made good lecturers:

The non-PhD lecturers give great lectures. They explain the materials clearly, and [are] very easy to follow (UKFG1-5).

I don't think we have many good lecturers. Basically the lectures are not very helpful. I prefer self-learning...The PhD tutors in tutorials...can't teach really. (UKFG2-6)

More participants across countries talked about 'teaching styles' indicating the particular ways in which lecturers provided instruction and explanation of the teaching content. For example, the students mentioned lecturers who were passionate, displayed a sense of humour, liked to use real-life examples, interacted with the students frequently, and used technologies for teaching etc.

For participants from both countries, lecturers' feedback and support were of great importance. Whether the lecturers provided appropriate and sufficient feedback and support made a difference in student experiences of the research-teaching nexus. As mentioned earlier in Section 4.2.3, a participant from CNFG1-3 talked about a module assignment of composing a research proposal, and a presentation of the proposal was optional with extra marks. The participant explained what happened in their presentations:

- Because of the extra marks, we all volunteered to do presentations. However, in the last session when we presented our research proposals, the lecturer did – not – show up [with emphasis]. He asked his PhD student to comment on our presentation...The PhD student might feel difficult to comment on so many research proposal presentations. He only made a few comments on the first few groups, and said nothing about the following presentations. We were like...[speechless].
- Then I have to appraise our lecturer, [the lecturer's name], he will comment on your stuff until you have nothing to say. (A conversation from CNFG1-3)

Likewise, a UK participant talked about his/her attitudes towards the additional reading:

I only read those [articles which] will be discussed. If there's no discussion, I think they're [the articles] not important, because the lecturer doesn't care whether we read or not. (UKFG2-4)

Another UK participant used an excellent metaphor to illustrate the importance of lecturers' feedback:

I think teaching should be a boomerang-like process. It's not finished when you [the lecturer] tell us something. You need to check what we throw back. Otherwise you just dump something. (UKFG2-5)

The extent to which the research elements integrated into teaching was practical and relevant to module content was perceived inconsistently. Some participants reported research-integrated teaching closely related to the curriculum, for example,

In our [module name], the assignment was writing a literature review based on reading literature about a certain topic chosen from the course content. (CNFG1-3)

I found the original model [of a theory in the module] in extra reading. (UKFG1-1)

On the contrary, some participants did not see a clear link between the integrated research elements and module content, or were not sure about what was expected from the research elements:

I think some papers in the reading list are irrelevant [to the module content]. (UKFG2-3)

[About a module assignment in an interview simulation form] We thought it could be fun, but it didn't make sense...(prompted by the researcher) I didn't get the point of what we were doing, [and] why we were doing that. (UKFG2-6)

The required difficulty and workload level from the research-integrated tasks was another issue frequently raised by the participants in both countries. Most participants agreed that compared to traditional teaching which simply focused on course knowledge transmission, the difficulty and workload of the learning process (including assignments) increased when research was integrated into teaching. The participants showed different attitudes towards the difficulty and workload of the research-teaching integration:

Personally, I enjoyed research-integrated teaching. Sometimes the assignments were more difficult, but I liked the challenges because I wanted to train my logical thinking more. (CNFG2-1)

[The research-teaching integration] Would be nice but means more work. (UKFG1-1)

I can take on more challenges. (UKFG1-5)

Only a few students actually completed the assignment [of replicating the lecturer's study] based on [the lecturer's name]'s original requirement. One of them is recommended to [one of the top two universities in China] University now [school recommendation for postgraduate admission]. (CNFG1-1)

I could never finish the additional reading. (UKFG1-5)

The amount of the tasks can be tricky...Even sometimes I'm interested, but [if] it's too time-consuming, I'll be like, just rushing to finish [the research-integrated tasks]. We have so many essays [to write]. (UKFG2-1)

It can be seen that while some participants enjoyed the higher levels of intellectual challenges in the research-teaching integration, some participants struggled when they perceived the difficulty and workload as exceeding their expectations. These aspects of Quality were also related to Motivation.

4.3.5 Motivation

In Motivation, sub-themes include 'students are encouraged to learn more', 'students increase/decrease passion in the discipline', and 'students increase/decrease passion in research'.

Some participants demonstrated a strong intrinsic interest in research. They embraced the research-teaching integration as an opportunity to engage with research, and became further motivated:

I want to be an academic or a researcher in an enterprise in the future. My ambition drives me to actively participate in research activities, and I'm firmer with my ambition. (CNFG1-3)

Research is a skill...So I can use the skill to learn more about, [and] understand the area I'm interested in. (UKFG1-4)

Particularly, a participant in the UK, who was accepted by another Russell Group university for postgraduate study and determined to pursue a PhD degree, expressed dissatisfaction about the research-teaching integration experiences at the university. Nevertheless, his/her passion for research and the discipline did not fade:

They [the university] didn't differentiate students enough. I mean, they didn't encourage the good students...I want to study [an Economics-related subject] for my PhD. (UKFG1-5)

As for most participants, who were more externally motivated in research, they talked about experiences of the research-teaching nexus either motivating or discouraging their interest in

research and the disciplinary areas. The factors that influenced their motivation varied, and included some of the factors related to teaching Quality as presented in Section 4.3.4, such as teaching styles, lecturers' feedback and support, required levels of difficulty and workload, and relevancy of the research content etc. For example,

Usually, I'm more passionate about learning when lecturers are passionate. However, like the lecturer who was too passionate about research and too passionate to teach us research, I felt a bit overwhelmed. (CNFG1-1)

- A lecturer...gave us a research topic, but didn't provide the necessary support. We were asked to analyse something, but we had limited access to data. A very frustrating coursework experience.
- [Additional explanation from another participant] Because much of the data were confidential, especially because they were related to company performance... But the lecturer required some internal data from the companies, so we don't have access...(prompted by the research) He/she told us to solve it ourselves. (A conversation from CNFG2-2)

If it's [the integrated research content] course-related or exam related, I'll be interested, and more...impressed. If irrelevant, [as] sometimes it happens, I'm like, what happened? (UKFG2-1)

I enjoy working on my dissertation... I learn a lot of different methods. It's interesting. Now I'm working on it, spending extra time, because I'm enjoying it. (UKFG2-3)

In both countries, forms of the course assessment and final marks in research-integrated teaching tended to be among the most important factors that motivated or demotivated participants' interest in research and the studied subjects. Five out of six focus groups in China and nine out of twelve focus groups in the UK talked about the impact of assessments and grades on their opinions of the experienced research-teaching integration. Most of the participants preferred the integrated research elements to be excluded from or only take up a small proportion of the course assessment. For one reason, the elevated difficulty and workload level of research-integrated tasks required students to devote more time and effort. Besides the varying willingness to engage more on a certain research-integrated assessment, students also needed to balance the allocation of time and effort among a number of assessments. As the participants mentioned:

There was a question in [module name]'s exam, integrating the course knowledge with research findings. I was a bit surprised. I thought the research content were extending beyond our curriculum, and shouldn't be seen in exams. (CNFG1-3)

We had a group assignment about writing a data analysis report. We thought usually group assignments were simple, but everyone in the group spent so much time on that assignment. The assignment took up 50% of the final marks. We almost considered giving up the 50% to prepare for other exams and assignments. (CNFG2-2)

For another reason, some research-integrated assessments were perceived to have ambiguous marking criteria, especially in the UK. Even if students had invested much time and effort, they might not receive the grades they expected or thought deserved. It was reflected by the participants:

When I choose optional modules, I always try to ask students from last year about the assessment. I like those 'normal' assessments, rather than too innovative ones. Exams, no one likes exams. But we've done so many exams. I'm more hesitant about something I'm not sure about. (CNFG1-2)

I have a friend. She scored an overall of 85 in second year. This year she scored 55 in an essay-based module. She still works very hard. Everyday stays in the library. She reported to the business school reception, and said she wanted to argue it. The reception said we're sorry but you can't argue now... They posted the [assessment] report paper on [a teaching platform], but my friend said she could read nothing from the report. (UKFG1-2)

[There were] So many uncertainties in those...research-integrated assignments. In the interview assignment [an inquiry-based assessment], we received unacceptable marks... The feedback was not convincing. (UKFG2-6)

It could be seen that students across countries highly valued marks and grades in their undergraduate study. If the research-teaching integration could positively contribute to the marks, for example, the extra marks for presenting the written proposals promised by the lecturer, students tended to be highly motivated to participate in the integration (see quotes by CNFG1-3 in Section 4.3.4). If the research-teaching integration negatively influenced their marks in the module or other modules due to imbalanced time and effort allocation, the participants showed resistance towards the integration.

Additionally, peer atmosphere or peer support was mentioned as an influence on Motivation, especially in China. In China, half of the focus groups talked about the overall importance of

peer atmosphere for Motivation and Beliefs (demonstrates in the following Section 4.3.6) of the research-teaching integration. In general, when the students were surrounded by other students who were interested in research or research-teaching integration, they were likely to gain research-related interests, too. It was interesting to hear that a whole dormitory (6 students) at CN1 were preparing for the postgraduate admission exam, whereas no one in the dormitory next door had such intentions. In the UK, two out of the twelve focus groups mentioned peer support in research-integrated teamwork. For example, a participant was encouraged to develop more interest in a particular disciplinary topic:

I had a teammate... He is an expert in [a disciplinary topic]. He knew everything, [and] every step of the assignment. And he was very nice, explaining everything to me. He introduced some books about [the disciplinary topic]. I haven't read them but I think I will [read the books] someday. (UKFG1-2)

4.3.6 Beliefs

In terms of Beliefs, sub-themes include 'research-integrated teaching stimulates my learning', 'the research culture at university stimulates my learning', and 'research-integrated teaching is generally important for me'.

The undergraduate students in business schools at research-intensive universities from both China and the UK indicated divergent opinions about the importance of research-teaching integration. Many participants considered integrating research into teaching important and beneficial. For their overall learning, research-integrated teaching was usually perceived as intellectually challenging, interesting, informative, real-world based, and developing a deep understanding and long memories of knowledge. For example,

I can learn something real [something practical from the research-teaching integration]. I can apply it to real life. (CNFG1-2)

In general, I think we need research-teaching integration, otherwise the teaching can be very dull and repetitive...Like we had in high schools. (CNFG1-3)

Research-teaching integration is more than just teaching us about knowledge, but is about ways of thinking, like logical thinking. So we know how to acquire knowledge. (CNFG2-1)

It's [the research-integrated teaching] intellectually challenging. (UKFG1-2)

I learn more from the research-integration, because I have more perspectives to help me judge what is good or bad. (UKFG1-4)

You engage more with the modules...The knowledge developed remains longer with you. (UKFG2-1)

For specific tasks like dissertations, research-teaching integration provided essential knowledge and skills for students, while the dissertation itself was also part of the research-teaching integration. As indicated in the conversation at UK1:

- I think what you [another participant] said before like starting [the research-teaching integration] in first year [was important]. It helps you be more accustomed to it. Because if you learn it too late, you kind of see it like a burden.
- Yeah, definitely. I remember in second year, I was a bit confused as to why it [the research-teaching integration] was so important, you know. As time has gone on, I've realised, especially like if I hadn't really done anything to research in second year, I'd be really struggling with my dissertation. (A conversation from UKFG1-2)

Particularly, for students who would like to pursue a postgraduate degree, experiences of the research-teaching integration helped them prepare for postgraduate study:

I feel like having practised my postgraduate life at the [name of a research-based] Summer Programme. (CNFG2-1)

Nevertheless, some participants did not consider the research-teaching integration important or necessary at the undergraduate level. The reasons were mainly related to their career plans, (lack of) an intrinsic interest in research, and possibly negative experiences of the research-teaching nexus at the university. From their point of view, good quality of teaching curriculum knowledge was the underpinning need for undergraduate study, and the current research-teaching integration at the university was too much and became excessive. When sometimes the extended knowledge or requirement from the research-teaching nexus was contradicted by the students' expected study outcome, such as receiving good grades or getting ready for employment, the students would further consider the research-teaching integration unnecessary. A final-year participant who studied in an Accounting-related programme in China stated:

Basically I just want to get a good job. I know I need a good university to get that good job. But I don't want to do research, and don't see the necessity of completing those time-consuming and effort-consuming [research-integrated] assignments. I'd rather spend more

time preparing for CPA...I feel it's unfair because I have no other choices. All good universities are doing research. (CNFG1-1)

Likewise, several participants in the UK indicated:

I think they've [the university] turned the university into a [pure] research institution. We're not researchers yet. We're not necessarily becoming researchers, either. (UKFG2-5)

I just want to pass the exams...Don't need the extra bit [of research-teaching integration] (UKFG2-7)

It [the research-teaching integration] should be something 'add-on'. It's not that important for undergrads...I prefer sticking to the basic models and basic knowledge. Research should be for postgrads. (UKFG2-7)

Primarily, the majority of participants, whether or not they agreed with the importance of the research-teaching nexus, believed that they needed more options about to what extent research was integrated into teaching and that more alternatives would make a difference in their overall attitudes towards the research-teaching nexus. While the research-teaching integration was compulsory, the participants tended to perceive being compelled. If the students lacked autonomy in deciding the ways and the content of their learning in research-teaching integration, they valued the importance of the nexus less.

If I had the opportunity to choose the research projects, I'd have enjoyed more of the research project itself. (UKFG1-1)

The integration is important when it's not a...duty, but an interest...I don't hate research, but I still want to have more options [about research-teaching integration]...When there are choices, the attitudes will be different. (UKFG2-5)

In addition, as mentioned in Section 4.3.5, peer atmosphere was perceived as a factor related to both Motivation and Beliefs, especially in China. A participant, whose whole dormitory were going to take the postgraduate entrance exam, explained his/her mind changes:

When I first came to the university, I didn't think of going to postgraduate study, and I wanted to find some internships at enterprises. But soon I found all my dormmates were 'five-star students' [excellent students]...They focused more on academic study, and invited me to participate in the [name of a research-based] Summer Programme. Since then I've

started to value academic research more, and now you see I'm preparing for the postgraduate entrance exam. (CNFG1-2)

4.3.7 Summary of nexus engagement in China and the UK

In the perceived ways of nexus engagement, undergraduates from business schools at research-intensive universities in China and the UK have displayed more similarities than dissimilarities. The participants from both countries reported the same main attributes as presented in SPRIQ (Visser-Wijnveen et al., 2016). While a few sub-themes that are not specified in SPRIQ have emerged from the inductive coding process, such as student understanding of research, teaching style, and difficulty and workload required from the research-teaching integration, these sub-themes are still belonging to the overarching themes from SPRIQ. The most differences between the countries come from the number of Extra-curricular Integration opportunities and the depth of participation in Extra-curricular Integration activities.

4.4 Informing questionnaire design for Phase 2 survey

The thematic analysis findings from the Phase 1 focus group interviews have informed the questionnaire design and modification in the following aspects.

First, the thematic analysis findings display good congruence with Healey's (2005) nexus framework and the attributes of nexus engagement from SPRIQ by Visser-Wijnveen et al. (2016). The findings suggest that the selected theoretical framework and questionnaire template are applicable in business schools at research-intensive universities in China and the UK.

Second, the themes and sub-themes identified from the thematic analysis help adapt Healey's (2005) text interpretation of different nexus types into questionnaire items, and develop items for Extra-curriculum Integration. The 12 items adapted upon Healey's (2005) nexus framework and three items developed based on Extra-curriculum Integration form the section investigating nexus-type experiences in the questionnaire (Part 2 as shown in Appendix C).

Third, the thematic analysis findings inform the modification of the SPRIQ (Visser-Wijnveen et al., 2016). In the final version of the 24-item SPRIQ, the numbers of items are not equal in each scale, which is likely to negatively affect the statistical analysis. With the emerged sub-themes, six additional items are added as supplementary content, equalising the item numbers in each scale. While some sub-themes from the SPRIQ are less referred to in focus group interviews (e.g. contribution to the disciplines, lecturers' clear instruction and explanation of module content), all

the original 24 items are retained for further investigation. The 30 items form the nexus engagement section of the questionnaire (Part 3 as shown in Appendix C). The additional six questions are as follows:

- I gained understanding of the meaning of 'research'. (Reflect)
- The contents being taught were practical. (Quality)
- The overall level of difficulty and amount of workload required were appropriate. (Quality)
- I was inspired to spend extra time and effort on learning my subjects beyond the requirement of exams. (Motivation)
- Good researchers make good teachers. (Beliefs)
- Research-integrated teaching is necessary for my learning. (Beliefs)

Fourth, the thematic analysis findings help with designing demographic questions in the questionnaire (Part 1 in Appendix C). For example, as the participants have explained different dissertation options and future study plans, corresponding items are introduced for potential analysis.

Chapter 5 Phase 2 Statistical analysis results

5.1 Introduction

This chapter presents results from the statistical analysis of the Phase 2 survey. The chapter is structured as follows. Section 5.2 shows a preliminary analysis of the data screening process. With considerations of compliance with the specific multivariate analysis assumptions and reliability analysis, Section 5.3 presents the results of an Exploratory Factor Analysis (EFA) that identifies nexus types in China and the UK respectively, which was conducted to investigate RQ1: What types of research-teaching nexus do business school undergraduate students experience at research-intensive universities in China and the UK? Section 5.4 presents the results of an EFA of student engagement with the nexuses, corresponding to RQ2: How do business school undergraduates engage with the research-teaching nexus that they experience at research-intensive universities in China and the UK? Section 5.5 provides the results of a regression analysis that shows how student engagement with nexuses varies across nexus types corresponding to RQ3: Are there any relationships between different nexus types and the ways business school undergraduate students engage with the nexuses at research-intensive universities in China and the UK?

5.2 Preliminary analysis

This section shows the steps undertaken in the data screening process before carrying out the statistical analysis reported in this chapter. As mentioned earlier in Section 3.5, there were 686 responses collected in total from the survey of business school undergraduate experiences of the research-teaching integration, among which 490 were from China and 196 were from the UK. After preliminary screening, 638 responses were considered valid (453 from China and 185 from the UK). The responses considered invalid were due to the following reasons:

- Some respondents left one or more sections blank which resulted in incomplete responses.
- Responses with identical choices throughout the whole questionnaire or with multiple answers selected under the same questionnaire items.
- Responses from programmes outside of a business school
 - While the non-business school respondents might be actually taking modules within the business school when the questionnaire was distributed, they might also be

invited by mistake due to the snowballing sampling process. Because of the anonymity of the questionnaire completion, it was impossible to trace or confirm whether these respondents met the study's recruitment criteria.

- Among the online responses, responses with a completion time shorter than 60 minutes were deleted, considering the questionnaire consisted of more than 50 items and required certain reading comprehension.
- One repetitive online submission with identical submission time and answers was deleted.

Among the 638 valid responses, 30 responses from China and 12 responses from the UK contained missing data. A few (one to three) items were left unchosen within these 42 responses. As Tabachnick and Fidell (2007) suggest, minor missing data (5% or less) from a large dataset does not cause serious problems and a good option to handle this is to delete these responses. Whilst the optimal choice would have been to impute the missing data, this study decided to delete the responses with missing data due to the large sample size. Therefore, deleting the responses with missing data brought 596 fully completed responses, among which 423 were from China and 173 were from the UK. The 596 cases were entered in SPSS for outlier detection (Tabachnick and Fidell, 2007).

No non-meaningful univariate outliers were detected when the data were screened. However, 26 cases were identified as multivariate outliers through Mahalanobis distance with $p < .001$ (Tabachnick and Fidell, 2007). Each outlying case was further investigated via regression analysis to identify the variables that caused the outlying cases to stand out from the remaining cases. Because outliers might have more influence on the Exploratory Factor Analysis (EFA) and also because the number of outliers was small compared to the total sample size (Tabachnick and Fidell, 2007; Pallant, 2010), the outlying cases were deleted from the dataset. Thus, for the Phase 2 survey, the final total number of responses adopted for statistical analysis was 570, with 408 from China and 162 from the UK. Table 5.1 displays the number of Phase 2 responses throughout the screening process.

Table 5.1 Phase 2 survey responses in the data screening process

	China		UK			Total	
University	CN1	CN2	China	UK1	UK2	UK	
Business School	total			total			
Responses collected	270	220	490	105	91	196	686

Valid	262	191	453	99	86	185	638
Fully completed	244	179	423	93	80	173	596
Final (without outliers)	240	168	408	86	76	162	570

Based on responses to the demographic questions from Part 1 of the questionnaire, Appendix D shows the respondent composition by gender, year of study, dissertation requirement, intention to pursue postgraduate study and courses taught in which languages respectively.

5.3 EFA of nexus types

This section presents the EFA results relating to the nexus types that were evident in China and the UK, as well as a text comparison between the nexus types in these two countries. Results in this section correspond to RQ1: What types of research-teaching nexus do business school undergraduate students experience at research-intensive universities in China and the UK?

5.3.1 EFA of nexus types in China

5.3.1.1 Reliability of scales and assessment of suitability for factor analysis (China nexus types)

As explained in Section 3.6.2, the nexus types part of the questionnaire used in the survey of business school undergraduate nexus experiences in four Universities consisted of 15 items (Item 2.1-Item 2.15). Every three items constituted a scale corresponding with each research-teaching nexus type that came from Healey's (2005) theoretical framework (Item 2.1-Item 2.12) plus an additional nexus type resulting from the Phase 1 focus group interviews (Item 2.13-Item 2.15; see Section 3.6.2 and Section 4.4). Reliability testing was carried out to examine the internal consistency of each Healey's type items, Healey's four types items together, and all items together. This step also helped eliminate problematic items in the subsequent EFA. Whilst Cronbach's (1951) alpha is traditionally considered a de facto measure of the internal consistency of scales, many scholars have stated the limitations of purely relying on alpha scores. For example, Hayes and Coutts (2020) show that alpha is biased by the number of items considered. A large number of items produces larger large alpha no matter the intercorrelations among the items. Also, as Sijtsma (2009) pointed out, alpha provided '*a lower bound to the 'true reliability'*' (p.113), and alpha itself alone should not be understood as a measure of internal consistency because of the possibilities of data

unidimensionality and multidimensionality. Sijtsma (2009) suggested that reporting both alpha and a greater lower bound would improve the quality of reliability estimations. Therefore, while this study used Cronbach's alpha for respecting their traditional use, these were complemented by Guttman's (1945) lambdas (among which lambda-3 equals Cronbach's alpha) as well as McDonald's (1999) omega. Table 5.2 presents Cronbach's alpha, McDonald's omega and Guttman's six lambdas scores of the China sample.

Table 5.2 Reliability test regarding China nexus types

Scales	Number of items	McDonald's Omega	Guttman's Lambdas & Cronbach's Alpha					
			λ_1	λ_2	λ_3^*	λ_4	λ_5	λ_6
1. Research-led teaching	3	.57	.23	.53	.45	.54	.57	.43
2. Research-based teaching	3	.72	.48	.72	.72	.65	.71	.63
3. Research-tutored teaching	3	.79	.53	.79	.79	.69	.78	.71
4. Research-oriented teaching	3	.84	.59	.84	.84	.71	.83	.78
5. Extra-curricular integration	3	.73	.46	.70	.70	.55	.72	.62
Healey's (2005) four nexus types (scales 1-4)	12	.89	.81	.89	.89	.82	.87	.90
All nexus types (scales 1-5)	15	.89	.83	.86	.89	.84	.87	.90

Note: Guttman's Lambda 3 is the same as Cronbach's Alpha

As can be seen from Table 5.2, except the scale of Research-led Teaching (Item 2.1-Item 2.3), most scales had moderate to high Cronbach's alpha scores (ranging between .70 and .89), McDonald's omega scores (ranging between .72 and .89) and Guttman's lambda scores (ranging between .55 and .90), indicating for the most part good internal consistency of the scales. In particular, Healey's four types items together and all the items together had the highest alpha, omega and lambda

scores among the scales, indicating Healey's items and added items from Phase 1 (Scale 5 in Table 5.2) had good internal consistency when considered altogether. The scale of Research-led Teaching had relatively poor internal consistency. If Item 2.1 (*Teaching focused on information transmission of subject contents*) was deleted, the Cronbach's alpha scores and McDonald's omega scores of the Research-led Teaching scale, the Healey's (2005) Four Nexus Types scale, and the overall Nexus Types scale all increased (as shown in Appendix E-1). Therefore, Item 2.1 was eliminated when carrying out EFA analysis on nexus types in China.

Regarding the data's suitability for factor analysis, the following aspects are examined: sample size, normality, multicollinearity, and data factorability. Numerous studies have discussed the guidelines of a satisfactory sample size needed for carrying out an EFA. As MacCallum, Widaman, Zhang and Hong (1999) summarised, most scholars recommended investigating either the absolute sample size or the ratio of participants to the number of variables. In terms of the absolute sample size, various scholars including Comrey and Lee (1992), Tabachnick and Fidell (2007) and Pallant (2010) agreed that a sample size of over 300 should be considered good to carry out an EFA. In the current study, the sample size of China was 408, indicating a satisfactory sample size for EFA. While normality of continuous variables is usually an important assumption for many multivariate analyses, Tabachnick and Fidell (2007) mention that when factor analysis is used descriptively to describe the latent relationships among the variables, which was what this study intended to do, the assumption of normal distribution was not '*in force*' (p.613). In addition, Ghasemi & Zahediasl (2012) pointed out that normality should not be a concern with a sample size of over 50, and the continuous variables could be treated as normally distributed. While the normality issue should not cause problems in the study's factor analysis, responses to Item 2.2 to Item 2.15 were assessed for skewness and kurtosis together with histograms. All the items assessed had skewness and kurtosis values between -1 and 1, and displayed overall normal distribution in histograms. The determinant of the correlation matrix was used to investigate multicollinearity (Tabachnick and Fidell, 2007; Field, 2018). Observation of the coefficients in the correlation matrix, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1960) and Bartlett's test of sphericity (Bartlett, 1954) were used to assess the strength of the intercorrelations among the variables.

5.3.1.2 Nexus types in China evident from EFA analysis

Regarding responses to Item 2.2 to Item 2.15, Exploratory Factor Analysis using Maximum Likelihood (ML) was used to identify research-teaching nexus types in China. When data were relatively normally distributed, EFA using ML is widely recommended by scholars including Fabrigar et al., (1999), Costello and Osborne (2005) as well as Tabachnick and Fidell (2007). This is because ML

provides goodness of fit indices of the model and allows significance testing for factors. In terms of EFA rotation, whilst orthogonal rotation results are clear and easy to interpret, the assumption of factors being independent is usually unrealistic, especially in social sciences (Costello and Osborne, 2005; Tabachnick and Fidell, 2007). As suggested by Fabrigar et al. (1999), researchers could start with oblique rotations and examine the factor correlations. If factor correlations in the factor correlation matrix are above .32, oblique rotations should be more appropriate than orthogonal rotations (Tabachnick and Fidell, 2007). Meanwhile, Tabachnick and Fidell (2007) suggested that if the patterns of correlations within the data was clear, different rotation methods would yield similar results. Therefore, Direct Oblimin (oblique rotation) was employed in the EFA as it allowed various factor intercorrelations (Tabachnick and Fidell, 2007).

The KMO measure of sampling adequacy was .92, which was higher than the commonly recommended value of .60 (Tabachnick and Fidell, 2007). Bartlett's test of sphericity was significant ($\chi^2(91) = 2365.53, p < .001$). Most correlations had coefficients greater than .30 and less than .70. Given the above indicators, an EFA with the 14 items (Item 2.2 to Item 2.15) was suitable. The determinant of the correlation matrix was .003. As suggested by Tabachnick and Fidell (2007) and Field (2018), if the value of determinant was not near zero, saying within a threshold of 0.00001, multicollinearity is not a concern.

Two factors were extracted from the EFA analysis and based on Kaiser's criterion, the scree test (Cattell, 1966) as well as O'Conner's (2000) parallel analysis. Table 5.3 shows the two-factor solution with the original eigenvalues, the percentages of variance explained and the eigenvalues from parallel analysis (percentile random data eigenvalue). Figure 5.1 shows the scree plot, in which the elbow appeared at two factors.

Table 5.3 Eigenvalues from ML factoring and parallel analysis (Item 2.2-2.15 China)

Factors	Original eigenvalues	% Variance explained	Eigenvalues from parallel analysis
1	6.09	43.48	1.39
2	1.34	9.55	1.29

Figure 5.1 Scree plot of nexus types EFA in China

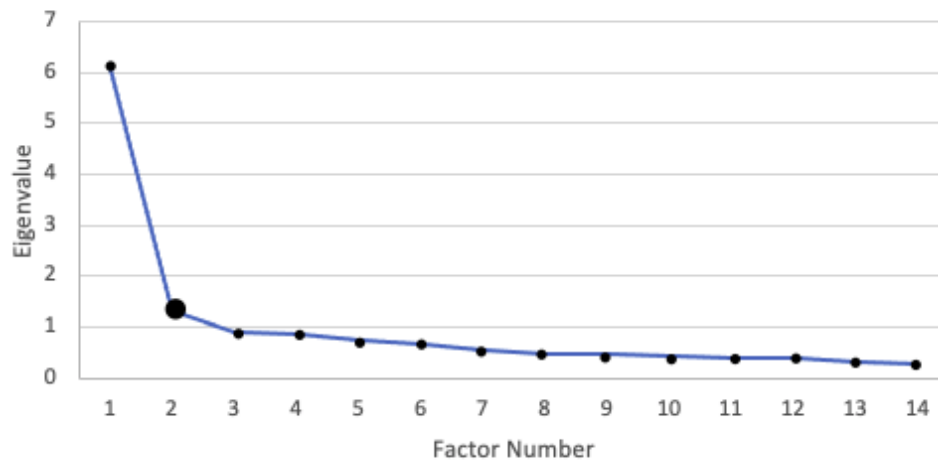


Table 5.4 shows the item factor loadings from the two-factor EFA. Tabachnick and Fidell (2007) suggest only variables with loadings of .32 and above should be reported. In line with Comrey and Lee (1992), they suggested variables with loadings of .32 were considered poor, .45 were fair, .55 were good, .63 were very good, and .71 and above were excellent. Nevertheless, these scholars also emphasised researchers could decide their own cut-off point for interpretation based on different preferences. Hair, Black, Babin and Anderson (2009) suggested sample size should be considered when deciding the values of factor loadings to interpret. For example, with a sample size of 350 and above, factor loadings of .30 and above could be considered noteworthy. With a sample size of around 200 and around 150, factor loadings of .40 and .45 were needed to be noteworthy respectively. As a reminder, in this study the sample size of the China sample and the UK sample were 408 and 162 respectively. In both samples, factor loadings greater than .30 were reported as a result. However, different cut-off points for interpreting factors were decided independently based on different sample sizes of the two countries. Loadings with absolute values greater than .32 were interpreted for the China sample and loadings with absolute values greater than .43 were interpreted for the UK sample.

Table 5.4 China nexus type item loadings upon the two factors resulting from the EFA (Item 2.2-2.15)

Items	Item loadings upon the two factors	
	Extra-curricular integration	Within programme integration
Research findings in my subject areas were introduced.		.62
My teachers decided module contents based on their own research interests.		.59
Teaching was largely based on inquiry-based activities. (E.g. Seeking for creative solutions to the posed questions/problems, undertaking an independent project as a part or whole of a module, or being involved in practical activities/fieldwork based on research projects etc.)		.63
We were active participants rather than audience in classes.		.67
The division between teachers and students was minimised.		.65
There were tutor-led group tutorials/seminars featuring small group discussion on published research findings.		.67
There were peer-led group discussion on research findings.		.62
There were one-to-one tutorials with tutors featuring discussion on research findings.		.71
Understanding the research process was emphasised.		.74
Research methods and skills were introduced. (E.g. Qualitative and quantitative methods, interviewing or survey skills, statistical analyses etc.)		.69
A research culture was promoted in teaching.		.68
My teachers invite us to participate in their research projects (as research assistants or participants) outside modules.	.40	

I have opportunities to undertake or participate in research projects in the university (not in modules).	1.06
There are research seminars, workshops and academic conferences related to my subjects held in my department and university.	.44

Note: Factor loadings less than .30 are not reported.

It can be seen from Table 5.4 that the items of extra-curricular research-teaching integration (Item 2.13-2.15), the additional nexus type suggested from Phase 1 focus group interviews, constituted one nexus type labelled as 'Extra-curricular Integration'. Noticeably, Item 2.14 had a factor loading greater than 1. While factor loadings greater than 1 was not often seen in EFA, they can be caused by using oblique rotation and are not erroneous. The items (Item 2.2-2.12) that indicated all of Healey's (2005) four nexus types together constituted a second nexus type, which was labelled as 'Within Programme Integration'. The EFA results reflected that the items generating Extra-curricular Integration and Within Programme Integration came from different studies. Results also showed the Extra-curricular Integration type from Phase 1 of this study did not overlap with Healey's (2005) nexus types, and it should be considered as a new and unique nexus type – at least within undergraduate education in Chinese Business schools. While the nexus type of Extra-curricular Integration from Phase 1 of this study was supported, Healey's (2005) four nexus types (research-led teaching, research-oriented teaching, research-based teaching and research-tutored teaching) were not empirically specified in the Chinese context. It was partly inconsistent with the qualitative findings from Phase 1 focus group interviews, in which Healey's different nexus types were mostly identified by the participants from China. Possible reasons will be explored in the Discussion Chapter.

To further investigate to what extent the China sample supported Healey's framework, two other EFAs considering only the items pertaining to Healey's types (Item 2.2-2.12) were conducted. The first EFA extracted only one factor based on eigenvalues exceeding one (supporting the EFA results above), and the second EFA forced four factors to be extracted. When four factors were forced, the EFA results partially supported Healey's (2005) nexus types, especially the research-oriented teaching type. The research-led teaching type and the research-tutored type were both joined by items from the research-based teaching type. Nevertheless, as this study looked forward to providing explicit empirical evidence of business school undergraduates' experiences of research-teaching nexuses in China and the UK, the results of the forced-four-factor EFA were not taken into

the following regression analysis in Section 5.5. Due to length constraints, the factor loadings of the forced-four-factor EFA are displayed in Appendix F.

Because not enough evidence for Healey's (2005) different nexus types was found in the Chinese context, regression scores of the 'Extra-curricular Integration' and the 'Within Programme Integration' factors/nexus types were used as statistical predictors of nexus engagement variables within the China sample regression reported in Section 5.5 (to answer RQ3).

5.3.2 EFA of nexus types in the UK

5.3.2.1 Reliability of scales and assessment of suitability for factor analysis (UK nexus types)

Regarding the UK sample, the steps used in conducting EFA were the same as the EFA conducted in the China sample. Table 5.5 shows Cronbach's alpha, McDonald's omega and Guttman's lambdas scores of the UK sample.

Table 5.5 Reliability test regarding UK nexus types

Scales	Number of items	McDonald's omega	Guttman's lambdas					
			λ_1	λ_2	λ_3^*	λ_4	λ_5	λ_6
1. Research-led teaching	3	.55	.26	.41	.39	.36	.44	.32
2. Research-based teaching	3	.61	.40	.60	.60	.57	.60	.50
3. Research-tutored teaching	3	.64	.41	.63	.62	.57	.64	.54
4. Research-oriented teaching	3	.78	.52	.78	.78	.70	.77	.71
5. Extra-curricular integration	3	.67	.42	.64	.64	.53	.66	.58
Healey's (2005) four nexus types (scales 1–4)	12	.82	.74	.82	.81	.71	.80	.83

All nexus types (scales 1-5)	15	.83	.77	.83	.82	.80	.81	.85
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Note: Guttman's Lambda 3 is the same as Cronbach's Alpha

Similar to the China sample, the scale of Research-led Teaching (Item 2.1-2.3) had poor internal consistency in the UK sample, too. Except the Research-led Teaching scale, all the other scales were considered to have acceptable to good internal consistency, with Cronbach's alpha scores ranging between .60 and .82, McDonald's omega ranging between .61 and .83, and Guttman's lambda scores ranging between .40 and .85. If Item 2.1 (*Teaching focused on information transmission of subject contents*) was deleted, Cronbach's alpha scores of the Research-led Teaching scale and the overall Nexus Types scale would increase, and the omega score of Healey's (2005) Four Nexus Types scale also increased (see Appendix E-2). Therefore, Item 2.1 was also eliminated when carrying out UK EFA analysis on nexus types. Both China and the UK sample suggested relatively poor construction of the Research-led Teaching scale, and raised query of Item 2.1. In future studies, further investigation and question modification will be considered as suggested in Section 6.5.3.

Sample size, normality, multicollinearity and data factorability were assessed for the UK dataset. Compared to the China sample containing 408 responses, the absolute sample size of the UK sample was smaller, which was 162. As mentioned earlier in Section 5.3.1.1, MacCallum et al. (1999) summarised that examining the ratio of participants to items could also decide whether the sample size was acceptable. Nevertheless, the recommended ratio remained inconsistent among different scholars. For example, Cattell (1978) suggested the ratio be between 3:1 and 6:1, and Gorsuch (1983) suggested a 5:1 ratio would be sufficient. More recently, Costello and Osborne (2005) found that while a 10:1 ratio was commonly followed by researchers to decide '*a priori*' (p. 4, originally in italics) sample size, many published research articles used a ratio of 2:1 or less. In the current study, the Nexus Types consisted of 15 items before item elimination. Therefore, the participant-to-item ratio was slightly higher than 10:1, meeting the ratio criteria recommended by most scholars.

Responses to Item 2.2 to Item 2.15 were assessed for skewness and kurtosis, among which responses to two items (Item 2.9 and Item 2.13) were slightly right-skewed. Therefore, the UK data was considered relatively normally distributed. The determinant of the correlation matrix was .023, indicating data safe from multicollinearity problems. Among the correlation matrix, about more than half of the coefficients exceeded .3. The results of KMO measure of sampling adequacy and Bartlett's test of sphericity will be displayed in the following section, Section 5.3.2.2.

5.3.2.2 Nexus type factors in the UK

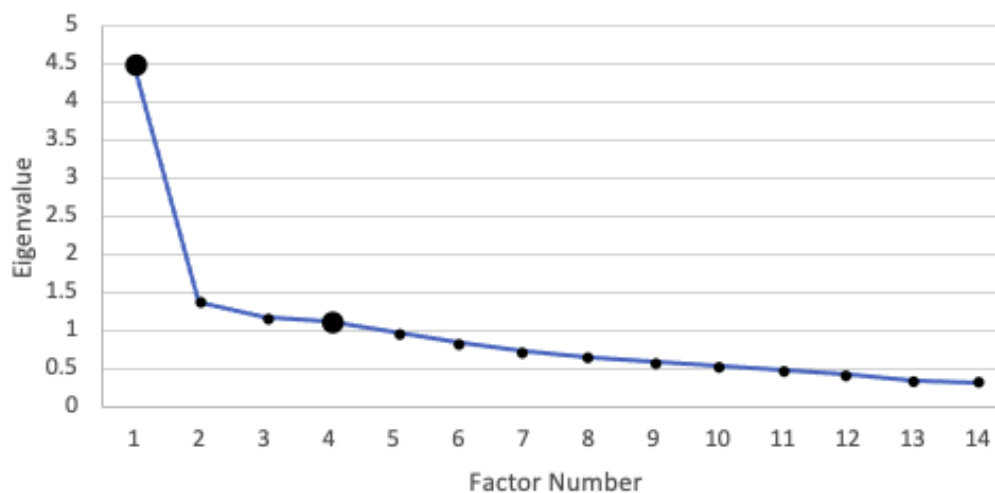
As in the China sample, EFA using Maximum Likelihood (ML) was used with Items 2.2 to 2.15 to identify research-teaching nexus types in the UK. An oblique rotation was also conducted through Direct Oblimin. Among the factor correlations, correlations ranged between .03 and .57.

The KMO measure of sampling adequacy was .82 (greater than .60). Bartlett's test of sphericity was significant ($\chi^2(91) = 588.94, p < .001$). Four factors were extracted based on Kaiser's criterion and scree test. A possibly different number of factors was suggested when taking parallel analysis into account. Table 5.6 shows the original eigenvalues, the percentages of total variance explained and the percentile random data eigenvalues from parallel analysis, and Figure 5.2 shows the scree plot of the nexus types EFA in the UK.

Table 5.6 Eigenvalues from ML factoring and parallel analysis (Item 2.2-2.15 UK)

Factors	Original eigenvalues	% Variance explained	Eigenvalues from parallel analysis
1	4.43	31.67	1.66
2	1.37	9.75	1.48
3	1.17	8.38	1.37
4	1.12	7.96	1.28

Figure 5.2 Scree plot of nexus types EFA in the UK



As can be seen from Table 5.6, while four factors were retained with eigenvalues exceeding 1, only one factor was retained if comparing the results of the original eigenvalues to the eigenvalues from parallel analysis. Nevertheless, the scree plot shown in Figure 5.2 shows an elbow point at four factors. Considering parallel analysis aimed to find the fewest possible number of factors, and this study looked for an 'optimal' number of factors, the four-factor solution was adopted.

Table 5.7 shows the item factor loadings in the UK context. As mentioned earlier in Section 5.3.1.2, Hair et al. (2009) suggested the decisions of factor loading significance should take sample size into account. While factor loadings above .30 were presented, only factor loadings (absolute values) reaching and beyond .43 were taken into account in interpretation. 'Extra-curricular Integration' comprised the items from Phase 1 focus group interviews (Item 2.13-2.15), which was consistent with the type of 'Extra-curricular Integration' found in the China sample. Considering the .43 cut-off point for factor loadings in the UK sample, the UK 'Extra-curricular Integration' was not well defined as it was just Item 2.14 (*I have opportunities to undertake or participate in research projects in the university (not in modules)*). The reason for the loading of Item 2.14 reached 1.00 was likely also due to the use of oblique rotation (explained earlier in Section 5.3.1.2). While the last item had two loadings on two factors, it was not considered as cross-loading as both loadings were below the .43 cut-off point.

Table 5.7 UK nexus type item factor loadings (Item 2.2-2.15)

Items	Item loadings upon the four factors			
	Extra-curricular integration	Academic interest led integration	Research training based integration	Inquiry-based Integration
Research findings in my subject areas were introduced.			.47	
My teachers decided module contents based on their own research interests.		-1.00		
Teaching was largely based on inquiry-based activities. (E.g. Seeking for creative solutions to the posed questions/problems, undertaking an independent project as a part or whole of a module, or being involved in practical activities/fieldwork based on research projects etc.)				.44
We were active participants rather than audience in classes.				.52
The division between teachers and students was minimised.				.68
There were tutor-led group tutorials/seminars featuring small group discussion on published research findings.				.31
There were peer-led group discussion on research findings.				.60
There were one-to-one tutorials with tutors featuring discussion on research findings.				.52
Understanding the research process was emphasised.			.80	

Research methods and skills were introduced. (E.g. Qualitative and quantitative methods, interviewing or survey skills, statistical analyses etc.)		.64
A research culture was promoted in teaching.		.59
My teachers invite us to participate in their research projects (as research assistants or participants) outside modules.	.34	
I have opportunities to undertake or participate in research projects in the university (not in modules).	1.00	
There are research seminars, workshops and academic conferences related to my subjects held in my department and university.	.37	.33

Note: Factor loadings (absolute values) less than .30 are not reported.

As shown in Table 5.7, standing out with a negative loading of -1.00, Item 2.3 (*My teachers decided module contents based on their own research interests.*) alone defined 'Academic Interest Led Integration'. It was worth remembering that the negative loading here simply came from the rotation process, and did not refer to reverse items. There were no reverse items in the whole questionnaire, and an increase in item scores indicated more presence or stronger agreement of the description in the items. The factor containing Item 2.2, 2.10, 2.11 and 2.12 was labelled as 'Research Training Based Integration', indicating a hybrid of Healey's (2005) research-oriented teaching type (Item 2.10-2.12) and research-led teaching type (Item 2.2). Item 2.15 was not included because its factor loading was less than the cut-off point. As the research-oriented teaching type highlighted understanding the processes of research and promoted '*a research ethos*' (Healey, 2005, p.69), it could also be concerned with introduction of research findings (Item 2.2). This possibly explained why these items joined together. 'Inquiry-based Integration' was comprised of Items 2.4-2.9 (Item 2.7 excluded due to small factor loading), indicating a joint Healey's (2005) research-based teaching type and research-tutored teaching type. While the essence of research-based teaching

was inquiry-based learning, tutorials or small group discussions about research-related topics (research-tutored teaching) could be considered part of inquiry-based activities.

As in the China sample, another two EFAs were conducted regarding Healey's (2005) nexus types only (Item 2.2-2.12) to examine to what extent the UK sample supported Healey's framework. Without forcing numbers of factors, the results were the same as the all-item EFA except for the 'Extra-curricular Integration Factor' (with items from Phase 1 of this study). If forcing four factors, the results partially supported Healey's framework. In particular, the research-oriented type was fully supported and the research-based teaching type was largely in line with the theory. Research-led type and research-tutored type each had one item loaded on only. Still, results of these two EFAs were not taken into the UK regression analysis in Section 5.5. Due to length constraints, the factor loadings of the forced-four-factor EFA were displayed in Appendix G.

'Extra-curricular Integration', 'Academic Interest Led Integration', 'Research Training Based Integration' and 'Inquiry-based Integration' factors/nexus types are taken into statistical regression as predictors of nexus engagement.

5.3.3 Comparing the EFA results of nexus types between China and the UK

As shown in Section 5.3.1 and Section 5.3.2, separate EFAs regarding nexus types were conducted on the China sample and the UK sample, yielding different factor structures. In both countries, the 'Extra-curricular Integration' Type from Phase 1 of this study was identified. This corresponded with Phase 1 findings, in which participants from both China and the UK referred to research-related activities outside modules.

In terms of Healey's (2005) four-type nexus framework, different empirical evidence was found between the two countries. In the Chinese context, statistical results from this study suggested Healey's (2005) nexus types existed as one unified type, and could not specify any sub-types unless manipulating the number of factors. For the Chinese respondents, nexuses were mainly distinguished via in-module activities or extra-curricular opportunities. This is partly inconsistent with Phase 1 findings, and possible reasons are explored in the Discussion Chapter.

In the UK context, the statistical EFA results partially supported Healey's (2005) framework with new combinations of the types proposed. For the business school undergraduates, the most straightforward experience of research-led teaching was based on lecturers' research interests. Also, understanding research findings was usually bonded with understanding research processes and establishing the research ethos. Combining Healey's research-based teaching and research-tutored

teaching, the inquiry-based teaching types might suggest that in practice tutoring was perceived by the students as part of the research-based teaching instead of being an independent research-teaching nexus type.

5.4 EFA of student engagement with nexuses

This section presents the results of EFAs that considered the ways that students engage with research-teaching nexuses in China and the UK, as well as text comparisons between the two countries. Results in this section correspond to RQ2: How do business school undergraduates engage with the types of research-teaching nexus that they experience at research-intensive universities in China and the UK?

5.4.1 EFA of student engagement with nexuses in China

5.4.1.1 Reliability of scales (China student engagement)

As explained earlier in Section 3.6.2, the Student Engagement part of the questionnaire consisted of 30 items (Item 3.16-3.45). This part was adapted from the SPRIQ final version (24-item) by Visser-Wijnveen et al. (2016) with additional six items from the Phase 1 focus group interviews. Every five items constituted a scale, corresponding with the six scales from the SPRIQ: reflection, current research, participation, quality of the course, motivation, and beliefs about the importance of research for learning. Reliability testing was carried out to examine the internal consistency of each scale and all the items together. Table 5.8 displays Cronbach's alpha, McDonald's omega and Guttman's six lambdas scores regarding the Student Engagement part in China.

Table 5.8 Reliability tests regarding China student engagement

Scales	Number of items	McDonald's omega	Guttman's lambdas					
			λ_1	λ_2	λ_3^*	λ_4	λ_5	λ_6
Reflection	5	.90	.72	.90	.90	.84	.88	.89
Current research	5	.86	.69	.86	.86	.74	.83	.85
Participation	5	.94	.74	.93	.93	.87	.92	.93
Quality	5	.77	.60	.76	.75	.51	.75	.74

Motivation	5	.83	.66	.83	.83	.76	.81	.81
Beliefs	5	.83	.67	.83	.83	.73	.81	.82
All ways of engagement	30	.94	.91	.94	.94	.73	.93	.97

Note: Guttman's Lambda 3 is the same as Cronbach's Alpha

All the scales in the Student Engagement part showed excellent alpha, omega and lambdas scores, suggesting good internal consistency of the scales. Particularly, if Item 3.44 (*Good researchers make good teachers.*) was removed, Cronbach's alpha and McDonald's omega scores of the Beliefs scale and the overall engagement scale would increase (as shown in Appendix E-1). After running different EFA tests with and without Item 3.44, Item 3.44 was removed in the formal EFA as the KMO and the percentages of cumulative total variance explained both increased without Item 3.44.

5.4.1.2 Student engagement factors in China

Skewness and kurtosis were assessed regarding Items 3.16-3.43 and Item 3.45. All the items had skewness and kurtosis values between -1 and 1, indicating an overall normal distribution. This was in line with the checking of histograms. The determinant of the correlation matrix was 2.505E-9, which indicated caution for possible multicollinearity issues. The majority of the coefficients in the correlation matrix were greater than .30 and less than .70, suggesting good data suitability for factor analysis.

As in the Nexus Type EFAs (see above), the Student Engagement EFAs also used Maximum Likelihood (ML) and Direct Oblimin rotation. With most factor correlations greater than .32 (Tabachnick and Fidell, 2007), interpretation of factors was based on the oblique rotation. The KMO measure of sampling adequacy was .94, and Bartlett's test of sphericity was significant ($\chi^2(406) = 7852.68, p < .001$). Five factors were extracted based on eigenvalue greater than 1 and the scree test as shown in Table 5.9 and Figure 5.3. While parallel analysis suggested a four-factor solution and scree plots suggested a possible six-factor solution, corresponding with the six scales from SPRIQ. As recommended by Costello and Osborne (2005), several EFAs were conducted with forced factor numbers of four, five and six. After examining the questionnaire items and the factor structures of the testing EFAs, five factors were retained as this solution provided a relatively clear factor structure with best interpretability.

Table 5.9 Eigenvalues from ML factoring and parallel analysis (China student engagement)

Factors	Original eigenvalues	% Variance explained	Eigenvalues from parallel analysis
1	11.76	40.56	1.61
2	3.37	11.61	1.50
3	1.70	5.87	1.45
4	1.69	5.84	1.39
5	1.08	3.72	1.34

Figure 5.3 Scree plot of student engagement EFA in China

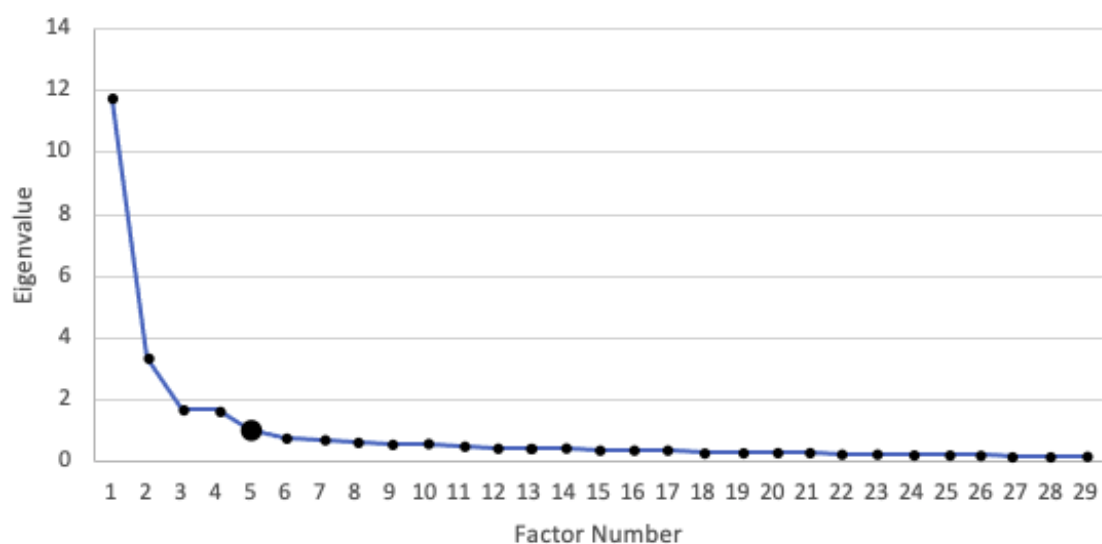


Table 5.10 shows the China Student Engagement item factor loadings. In general, the factor structure corresponded with the scales from SPRIQ clearly, except that the Reflection and Current Research scales in SPRIQ combined as one factor. The factor combining the Reflection and Current Research scales from SPRIQ was labelled as 'Awareness of Research'. While the other four factors exactly corresponded with the scales from SPRIQ, slight changes were made to the labels for more accurate descriptions in current study. The new labels of the ways of nexus engagement were 'Motivation from Research-teaching Integration', 'Participation in Research', 'Beliefs of Importance of Research-teaching Integration' and 'Quality of Teaching Delivery'. Again, as explained earlier in Section 5.3.2.2, the negative loadings did not refer to reverse items. Regression scores of these five factors were taken from this analysis and used as dependent variables in the China regression analysis in Section 5.5 (answering RQ3).

Table 5.10 China student engagement item factor loadings (Item 3.16-3.43 and 3.45)

Items	Item loadings upon the five factors				
	Awn	Mot	Par	Bel	Qua
I gained understanding of the meaning of 'research'.*	.79				
I learned knowledge about research findings.	.77				
I learned to pay attention to the way research is carried out.	.78				
The rigorous research process was an essential part of the curriculum.	.64				
Attention was paid to research methodology.	.72				
I became familiar with the research carried out by my teachers.	.58				
I came in contact with my teachers' research.	.64				
My awareness of the research issues that academic researchers are currently contributing to was increased.	.62				
I learned what kind of studies have been carried out in my field.	.74				
Links to current research practices were made.	.70				
My contribution to the research was valued.				-.73	
My participation in the research was important.				-.82	
I made a contribution to development in my field.				-.93	
As a student I felt involved with the research.				-.57	
I became involved in my teachers' research.				-.68	
My teachers carried out instruction and feedback adequately.					.34
My teachers were able to explain the subject matter effectively.					.69
I developed an accurate picture of what was expected of me.					.68

The contents being taught were practical.*	.65
The overall level of difficulty and amount of workload required were appropriate.*	.52
I was inspired to learn more about this discipline.	.70
I became enthusiastic about my scientific domain.	.85
My interest in research in this area was increased.	.85
My teachers encouraged personal interest and enthusiasm for research in this field.	.47
I was inspired to spend extra time and effort on learning my subjects beyond the requirement of exams.*	.59
My learning is stimulated when education is grounded in research.	-.80
Education in which rigorous research is central stimulates my learning.	-.82
The research culture at the institute stimulates my learning process.	-.75
Research-integrated teaching is necessary for my learning.*	-.71

Note: Factor loadings (absolute values) less than .30 are not reported. Items with a * indicate additional items from Phase 1 and items without a * indicate items from the SPRIQ. Awn: Awareness of Research, Mot: Motivation from Research-teaching Integration, Par: Participation in Research, Bel: Beliefs of Importance of Research-teaching Integration, and Qua: Quality of Teaching Delivery.

5.4.2 EFA of student engagement with nexuses in the UK

5.4.2.1 Reliability of scales (UK student engagement)

Table 5.11 shows the reliability test results regarding the Student Engagement part of the questionnaire from its use in the UK. As with the data from China, all the scales displayed excellent alpha, omega and lambdas scores, suggesting good internal consistency of the scales in this part. In particular, if Item 3.35 (*The overall level of difficulty and amount of workload required were appropriate.*) was removed, Cronbach's alpha and McDonald's omega scores of the Quality of Course scale and the overall engagement scale would increase (see Appendix E-2). Again, with different EFA

trials with and without Item 3.35, Item 3.35 was removed in the formal EFA for improved KMO and percentages of total variance were explained.

Table 5.11 Reliability test regarding UK student engagement

Scales	Number of items	McDonald's omega	Guttman's lambdas					
			λ_1	λ_2	λ_3^*	λ_4	λ_5	λ_6
Reflection	5	.90	.72	.90	.90	.84	.88	.89
Current research	5	.86	.69	.86	.86	.74	.83	.85
Participation	5	.94	.74	.93	.93	.87	.92	.93
Quality	5	.77	.60	.76	.75	.51	.75	.74
Motivation	5	.83	.66	.83	.83	.76	.81	.81
Beliefs	5	.83	.67	.83	.83	.73	.81	.82
All ways of engagement	30	.94	.91	.94	.94	.73	.93	.97

Note: Guttman's Lambda 3 is the same as Cronbach's Alpha

5.4.2.2 Student engagement factors in the UK

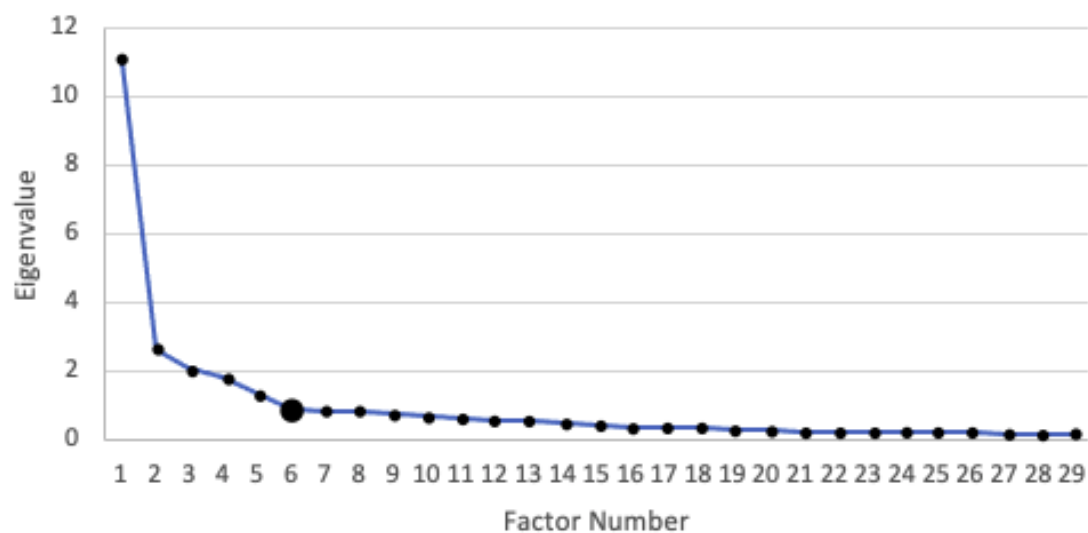
Skewness and kurtosis were assessed regarding Item 3.16-3.34 and Item 3.36-3.45. Except Item 3.30 (*I became involved in my teachers' research.*), all the other items had skewness and kurtosis values between -1 and 1, indicating an overall normal distribution. Responses to Item 3.30 was slightly positively skewed. The determinant of the correlation matrix was 2.40E-009. Most variables correlated at greater than .30.

Maximum Likelihood (ML) and Direct Oblimin rotation were also employed in the Student Engagement EFA in the UK. While Varimax rotation was attempted, interpretation of factors was based on the oblique rotations as most factor correlations exceeded .32 (Tabachnick and Fidell, 2007). The KMO measure of sampling adequacy was .91, and Bartlett's test of sphericity was significant ($\chi^2(406) = 2987.02, p < .001$). Possible numbers of factors differed based on different criteria as shown in Table 5.12 and Figure 5.4.

Table 5.12 Eigenvalues from ML factoring and parallel analysis (UK student engagement)

Factors	Original eigenvalues	% Variance explained	Eigenvalues from parallel analysis
1	11.10	38.27	1.98
2	2.64	9.09	1.84
3	2.10	7.23	1.73
4	1.80	6.19	1.62
5	1.37	4.72	1.55

Figure 5.4 Scree plot of student engagement EFA in the UK



As can be seen from Table 5.12 and Figure 5.4, If applying Kaiser's criterion, five factors were extracted with eigenvalue exceeding 1. Parallel analysis suggested four factors instead. Meanwhile, scree test displayed a relatively clear elbow point at six factors. After investigating the items and the factor structure from EFA tests, these solutions were rejected and five factors were retained for a clearer factor structure with optimal interpretability.

Table 5.13 displays the factor loadings of the UK Student Engagement items. As mentioned earlier in Section 5.3.2.2, in the UK sample, factor loadings reaching and above .43 were considered interpretable due to the relatively small sample size. As with the Student Engagement EFA results in China, the UK results also showed correspondence with scales from SPRIQ in general, except that the Reflection and Current Research scales were combined into one factor. The joint factor of Reflection

and Current Research was labelled as 'Awareness of Research'. Also in parallel with the counterparts in China, the other four factors were renamed as 'Participation in Research', 'Quality of Teaching Delivery', 'Beliefs of Importance of Research-teaching Integration' and 'Motivation from Research-teaching Integration'. While Items 3.21, 3.22 and 3.23 had loadings on two factors, only one loading of Item 3.22 merely reached the cut-off point. However, these three items still needed investigation because their loadings on two factors had close values. This indicated Items 3.21, 3.22 and 3.23 could point to both Awareness of Research and Participation in Research. By looking into the items, these three items mainly referred to students' awareness and knowledge about research of their lecturers and in current academia. Meanwhile, getting to know or engage in their own lecturers' research projects might also hint at participation in research for the students. This could help explain the cross-loadings. Regression scores of the five factors were taken from this EFA and used as dependent variables in the following regression analysis in Section 5.5.

Table 5.13 UK student engagement item factor loadings (Item 3.16-3.34 and 3.36-3.45)

Items	Item loadings upon the five Factors				
	Awn	Par	Qua	Bel	Mot
I gained understanding of the meaning of 'research'.*	.80				
I learned knowledge about research findings.	.79				
I learned to pay attention to the way research is carried out.	.74				
The rigorous research process was an essential part of the curriculum.	.59				
Attention was paid to research methodology.	.69				
I became familiar with the research carried out by my teachers.	.37	-.42			
I came in contact with my teachers' research.	.43	-.36			
My awareness of the research issues that academic researchers are currently contributing to was increased.	.38	-.40			
I learned what kind of studies have been carried out in my field.	.52				
Links to current research practices were made.	.56				

My contribution to the research was valued.	-0.71
My participation in the research was important.	-0.77
I made a contribution to development in my field.	-0.86
As a student I felt involved with the research.	-0.82
I became involved in my teachers' research.	-0.77
My teachers carried out instruction and feedback adequately.	.62
My teachers were able to explain the subject matter effectively.	.77
I developed an accurate picture of what was expected of me.	.86
The contents being taught were practical.*	.39
I was inspired to learn more about this discipline.	-0.75
I became enthusiastic about my scientific domain.	-0.80
My interest in research in this area was increased.	-0.50
My teachers encouraged personal interest and enthusiasm for research in this field.	-0.38
I was inspired to spend extra time and effort on learning my subjects beyond the requirement of exams.*	-0.58
My learning is stimulated when education is grounded in research.	-0.68
Education in which rigorous research is central stimulates my learning.	-0.70
The research culture at the institute stimulates my learning process.	-0.63
Good researchers make good teachers.*	-0.49
Research-integrated teaching is necessary for my learning.*	-0.69

Note: Factor loadings (absolute values) less than .30 are not reported. Items with a * indicate additional items from Phase 1 and items without a * indicate items from the SPRIQ. Awn: Awareness

of Research, Mot: Motivation from Research-teaching Integration, Par: Participation in Research, Bel: Beliefs of Importance of Research-teaching Integration, and Qua: Quality of Teaching Delivery.

5.4.3 Comparing the EFA results of the student engagement with nexuses between China and the UK

Different from their experiences of the nexus types, business school undergraduates from China and the UK shared very similar ways of how they engaged with the nexus types. Results from both countries were largely in line with the results of SPRIQ, which was originally developed in the Netherlands. Business school undergraduates from the two countries engaged with the different nexus types via awareness of research, participation, motivation, quality of teaching delivery and beliefs of the importance of research-teaching integration. While SPRIQ differentiated 'Reflection' and 'Current Research', respondents from both China and the UK tended to consider these two factors as the same thing, which was 'Awareness of Research'. Slight differences were found between the two countries regarding some perceptions of getting to know lecturers' research and the latest research contributions in academia. Respondents from China relatively clearly considered it belonging to 'awareness' whereas some respondents from the UK might argue it also related to 'Participation in Research'. Possible reasons for these consistencies and inconsistencies are explored in the Discussion Chapter.

5.5 Regression analysis of the relationships between the ways students engage with the nexuses and different nexus types

This section presents the results of regression analyses that show the relationships shared between different nexus types and the ways students engage with these nexus types in China and the UK (plus a text comparison between the two countries). Results correspond to RQ3: Are there any relationships between different nexus types and the ways business school undergraduate students engage with the nexuses at research-intensive universities in China and the UK?

Multiple regression analyses were performed between each way students engaged with the nexuses (Awareness of Research, Participation in Research, Quality of Teaching Delivery, Motivation from Research-teaching Integration and Beliefs of Importance of Research-teaching Integration; dependent variables) and the nexus types that students reported as experienced (Extra-curricular Integration and Within Programme Integration in China; Extra-curricular Integration, Academic Interest Led Integration, Research Training Based Integration and Inquiry-based Integration in the

UK; independent variables). As Tabachnick and Fidell (2007) warned, applying multiple versions of the same dependent variables would inflate Type I errors. Therefore, the Bonferroni correction was considered to control the error rate by applying a lower p-value required to be significant. In this study, the p-value required to be significant would be .01 (.05/5) after Bonferroni correction. However, interpretation of results was decided to take both significance level at .01 and .05 into account for gaining an understanding of the relationships between nexus engagement and the nexus types with more detail. Meanwhile, the effect sizes (β s) were examined when interpreting the relationships between the ways students engage with the nexuses and the nexus types. It is also noted that one statistical predictor was consistent across China and the UK, which was Extra-curricular Integration. The assumptions of conducting multiple regression analysis were evaluated before each regression following Tabachnick and Fidell's (2007) guidance, including the ratio of cases to independent variables, normality and independence of residuals, outliers and multicollinearity.

It is worth remembering that no formal statistical comparisons were made between China and the UK because of the country-specific ways of experiencing the research-teaching nexuses. Instead, this study presents text-based comparisons of the overall importance of nexus types for nexus engagement as well as a description of similarities and differences observed across countries in terms of which specific nexus type experiences were important for the different ways of nexus engagement.

5.5.1 Relationships between Awareness of Research and nexus types

5.5.1.1 Relationships between Awareness of Research and the two nexus types experienced in China

Regarding the associations shared between Awareness of Research and the two nexus types experienced in China, the proportion of variance explained (r^2) was significantly from zero, $F(2,405) = 268.77$, $p < .001$. As shown in Table 5.14, the adjusted r^2 value (taking into account the number of independent variables in the regression model) of .57 indicated that 57% of the variation in Awareness of Research was accounted for by Extra-curricular Integration and Within Programme Integration together. Both statistical predictors were positively associated with Awareness of Research, and were both significant at the .01 level. The results suggested that more experiences of Extra-curricular Integration and Within Programme Integration were associated with raised Awareness of Research, including gained understanding of the meaning of research, research processes, and latest research findings in the discipline etc. With similar β values (Extra-curricular

Integration β : .45 and Within Programme Integration β : .43), the two nexus types appeared similarly important in predicting business school undergraduates' Awareness of Research in China.

Table 5.14 Regression analysis results: Awareness of Research and nexus types experienced in China

	B	SE B	β	t	p	r²	Adjusted r²
Constant	.00	.03		< .001	-	.57	.57
Extra-curricular integration	.44	.04	.45	12.16	< .001		
Within programme integration	.44	.04	.43	11.64	< .001		

5.5.1.2 Relationships between Awareness of Research and the four nexus types experienced in the UK

In the UK regression of nexus type variables on Awareness of Research, the proportion of variance explained (r^2) was significantly from zero, $F(4,157) = 40.57$, $p < .001$. As can be seen from Table 5.15, with $r^2 = .51$ and adjusted $r^2 = .50$, around half of the variance in Awareness of Research was accounted for by all four nexus types together. Only one statistical predictor, Research Training Based Integration, was significant at the .01 level. Extra-curricular Integration, Academic Interest Led Integration and Inquiry-based Integration did not contribute significantly to regression at the .01 or .05 level. Results suggested that increased Awareness of Research was most clearly related to more experiences of Research Training Based Integration in the UK context.

Table 5.15 Regression analysis results: Awareness of Research and nexus types experienced in the UK

	B	SE B	β	t	p	r²	Adjusted r²
Constant	.00	.05		< .001	-	.51	.50
Extra-curricular integration	.08	.06	.09	1.42	.158		

Academic interest led integration	.03	.05	.03	.59	.554
Research training based integration	.69	.08	.66	8.23	< .001
Inquiry-based integration	.05	.09	.04	.52	.607

5.5.1.3 Observed differences between China and the UK: How the nexuses that students experience relate to their Awareness of Research

The statistical predictors in China predicted slightly more of the variation in Awareness of Research (57%) than the statistical predictors in the UK (50%), indicating the impact of experiencing the nexus types on student Awareness of Research was slightly higher in China than in the UK. As the only consistent statistical predictor across countries, Extra-curricular Integration was an important nexus type in raising Awareness of Research in China, but not as important in the UK. In China, with similar β values, experiences with Extra-curricular Integration and Within Programme Integration were almost equally important for business school undergraduates to improve their Awareness of Research. In the UK context, Research Training Based Integration was the only statistical predictor significantly contributing to Awareness of Research, indicating that the respondents found Research Training Based Integration was the most important nexus type related to growing Awareness of Research. It was understandable because Research Training Based Integration was a nexus type highlighting understanding research processes and promoting research ethos. Echoing the Phase 1 focus group interview findings, many participants from the UK considered this nexus type (originally Healey's Research-oriented teaching type) as most straightforwardly related to 'research'.

5.5.2 Relationships between Participation in Research and nexus types

5.5.2.1 Relationships between Participation in Research and the two nexus types experienced in China

Table 5.16 shows the correlations between Participation in Research and the two nexus types experienced in China ($F(2,405) = 186.31, p < .001$). 48% of the variation in Participation in Research was accounted for by Extra-curricular Integration and Within Programme Integration. Both statistical predictors were positively associated with Participation in Research and were significant at the .01

level, indicating both nexus types were associated with more opportunities for students to participate in research-related projects or activities. With a slightly higher β value, Within Programme Integration ($\beta = .44$) appeared to contribute more than Extra-curricular Integration ($\beta = .37$) in terms of promoting student Participation in Research.

Table 5.16 Regression analysis results: Participation in Research and nexus types experienced in China

	B	SE B	β	t	p	r^2	Adjusted r^2
Constant	.00	.03		< .001	-	.48	.48
Extra-curricular integration	.35	.04	.37	9.00	< .001		
Within programme integration	.44	.04	.44	10.79	< .001		

5.5.2.2 Relationships between Participation in Research and the four nexus types experienced in the UK

In the UK context, Table 5.17 displays the associations between Participation in Research and the four nexus types ($F(4,157) = 39.39, p < .001$). About half (49% adjusted) of the variability in Participation in Research was explained by the four nexus types. Inquiry-based Integration was significant at the .01 level with a highest β value (.48), making it the most important statistical predictor in predicting UK respondents' Participation in Research. This suggested business school undergraduates with more experiences of Inquiry-based Integration were likely to participate in more research-related projects or activities. Extra-curricular Integration and Research Training Based Integration were significant at the .05 level. As mentioned earlier in the opening section of Section 5.5, Bonferroni correction was considered to control the inflated Type I error due to repeated dependent variables (Tabachnick and Fidell, 2007). Here if Bonferroni correction was applied, the p-value for each test should be .01 (.05/5). Nevertheless, aiming at presenting more details of the relationships between nexus engagement and experienced nexus types, the p-value of .05 was also accepted and β values were considered in interpretation. With a lower p-value (.027) and a higher β value (.18), Research Training Based Integration tended to be a more important statistical predictor

than Extra-curricular Integration regarding Participation in Research. Academic Interest Led Integration was not significant at the .05 level.

Table 5.17 Regression analysis results: Participation in Research and nexus types experienced in the UK

	B	SE B	β	t	p	r²	Adjusted r²
Constant	.00	.05		< .001	-	.50	.49
Extra-curricular integration	.13	.06	.13	2.07	.041		
Academic interest led integration	.08	.06	.08	1.34	.181		
Research training based integration	.19	.09	.18	2.24	.027		
Inquiry-based integration	.53	.09	.48	5.70	< .001		

5.5.2.3 Observed differences between China and the UK: How the nexus types that students experience relate to their Participation in Research

In terms of Participation in Research, this is the way of nexus engagement in which the most similarities were found across countries. Statistical predictors across countries explained roughly the same amount of variance in Participation in Research (China: 48%, UK: 49%), indicating the impact of nexus experiences on student Participation in Research was very similar between China and the UK. There were also similarities in which specific nexus type was more important for Participation in Research across countries. In China, both Extra-curricular Integration and Within Programme Integration experiences were important for business school undergraduates to actively take part in research, and Within Programme Integration was even more important than Extra-curricular Integration. In the UK, three of the four nexus types statistically contributed to Participation in Research, which were Inquiry-based Integration, Research Training Based Integration and Extra-curricular Integration in descending order of importance. Similar to China, while being both important for Participation in Research, the within-curriculum nexus types were perceived as more important than the extra-curricular type in the UK. Nevertheless, the consistent statistical predictor

across countries, Extra-curricular Integration, was less important in the UK than in China with a higher p-value (UK at .041 and China < .001) and a lower β value (UK at .13 and China at .37). This indicated experiences with research-teaching integration outside the curriculum were more likely to associate with more active research participation among business school undergraduates in China than in the UK.

5.5.3 Relationships between Quality of Teaching Delivery and nexus types

5.5.3.1 Relationships between Quality of Teaching Delivery and the two nexus types experienced in China

Regarding correlations between Quality of Teaching Delivery and the two nexus types experienced in China ($F(2,405) = 40.34, p < .001$), as shown in Table 5.18, less than 20% (adjusted $r^2 = .16$) of the variation in Quality of Teaching Delivery was accounted for by Extra-curricular Integration and Within Programme Integration. In comparison with Awareness of Research (adjusted $r^2 = .57$) in Section 5.5.1.1. and Participation in Research (adjusted $r^2 = .48$) in Section 5.5.2.1, nexus types in China were much less predictive for Quality of Teaching Delivery than the other two ways of nexus engagement. Nevertheless, both statistical predictors were significant at the .01 level and were positively associated with Quality of Teaching Delivery, indicating students still perceived better quality of teaching instructions and course deliveries with experiences of Extra-curricular Integration and Within Programme Integration. While Within Programme Integration appeared to be slightly more important with a slightly higher β value at .26, it was worth knowing that Extra-curricular Integration also helped enhance student perceptions of teaching quality and within-programme course delivery.

Table 5.18 Regression analysis results: Quality of Teaching Delivery and nexus types experienced in China

	B	SE B	β	t	p	r^2	Adjusted r^2
Constant	.00	.04		< .001	-	.17	.16
Extra-curricular integration	.19	.05	.21	4.08	< .001		
Within programme integration	.25	.05	.26	5.12	< .001		

5.5.3.2 Relationships between Quality of Teaching Delivery and the four nexus types experienced in the UK

In regard to correlations between Quality of Teaching Delivery and nexus types experienced in the UK ($F(4,157) = 6.45, p < .001$), as displayed in Table 5.19, less than 15% (adjusted $r^2 = .12$) of the variance in Quality of Teaching Delivery was accounted for by the four nexus types together. Similar to their counterparts in China, nexus types in the UK were also much less predictive for Quality of Teaching Delivery than Awareness of Research (adjusted $r^2 = .50$) in Section 5.5.1.2 and Participation in Research (adjusted $r^2 = .49$) in Section 5.5.2.2. Among the four statistical predictors, only Extra-curricular Integration was significant at the .05 level with a modest β value of .20. As explained earlier in Section 5.5.2.2, while the p-value should be .01 to be significant with a Bonferroni correction taking into account, statistical predictors significant at the .05 level were kept in order to display more details of the relationships between nexus engagement and the different nexus types. None of the other three statistical predictors, which were Academic Interest Led Integration, Research Training Based Integration and Inquiry-based Integration, contribute significantly to regression at the .05 level. It was interesting to note that respondents in the UK tended to perceive higher quality of teaching instructions and more clarified course expectations with more Extra-curricular Integration experiences, rather than experiences of any within-programme integration type.

Table 5.19 Regression analysis results: Quality of Teaching Delivery and nexus types experienced in the UK

	B	SE B	β	t	p	r^2	Adjusted r^2
Constant	.00	.07		< .001	-	.14	.12
Extra-curricular integration	.18	.08	.20	2.38	.019		
Academic interest led integration	.02	.07	.02	.23	.819		
Research training based integration	.20	.11	.20	1.88	.062		

Inquiry-based integration	.08	.12	.08	.67	.506
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5.5.3.3 Observed differences between China and the UK: How the nexuses that students experience relate to their perceived Quality of Teaching Delivery

In general, with relatively small amount of variance in Quality of Teaching Delivery (China: 16%, the UK: 12%) was explained, in both countries nexus types were less predictive for Quality of Teaching Delivery than for Awareness of Research and Participation in Research. As the consistent statistical predictor, Extra-curricular Integration was considered important for improved perceptions of Quality of Teaching Delivery by respondents from both countries. In China, Within Programme Integration was considered more important for perceiving higher quality of teaching instructions and course deliveries. In contrast, none of the three within-programme nexus types was considered important in relation to Quality of Teaching Delivery in the UK. For the UK respondents, experiences of the research-teaching nexus outside the curriculum were more likely to make them perceive better teaching and course instructions within the programme instead.

5.5.4 Relationships between Motivation from Research-teaching Integration and nexus types

5.5.4.1 Relationships between Motivation from Research-teaching Integration and the two nexus types experienced in China

Table 5.20 shows the correlations between Motivation from Research-teaching Integration and nexus types in China ($F(2,405) = 50.89, p < .001$). One-fifth of the variation in Motivation from Research-teaching Integration was accounted for by the two nexus types with r^2 and adjusted r^2 both at .20. Both Extra-curricular Integration and Within Programme Integration were significant at the .01 level and were positively related to Motivation from Research-teaching Integration. This suggested that students' enthusiasm for research and their disciplines was boosted along with more experiences of the two nexus types. Within Programme Integration ($\beta = .32$) appeared to be a more important booster than Extra-curricular Integration ($\beta = .20$).

Table 5.20 Regression analysis results: Motivation from Research-teaching Integration and nexus types experienced in China

	B	SE B	β	t	p	r²	Adjusted r²
Constant	.00	.04		< .001	-	.20	.20
Extra-curricular integration	.19	.05	.20	3.96	< .001		
Within programme integration	.32	.05	.32	6.30	< .001		

5.5.4.2 Relationships between Motivation from Research-teaching Integration and the four nexus types experienced in the UK

Table 5.21 shows the correlations between Motivation from Research-teaching Integration and the nexus types in the UK ($F(4,157) = 7.20, p < .001$). 16% (13% adjusted) of the variability in Motivation from Research-teaching Integration was predicted by these four nexus types. Research Training Based Integration was the only statistical predictor significant at the .01 level, and was positively associated with the dependent variable. Extra-curricular Integration, Academic Interest Led Integration and Inquiry-based Integration were not significant at the .05 level. Results indicated that business school undergraduates were motivated to learn more about research and more about their disciplines with more experiences of Research Training Based Integration in the UK context. As Research Training Based Integration focused on understanding research processes and promoting research ethos, it was understandable to see this nexus type inspiring students to be passionate about research and their learning subjects.

Table 5.21 Regression analysis results: Motivation from Research-teaching Integration and nexus types experienced in the UK

	B	SE B	β	t	p	r²	Adjusted r²
Constant	.00	.07		< .001	-	.16	.13
Extra-curricular integration	.13	.08	.15	1.77	.078		

Academic interest led integration	.07	.07	.08	1.02	.310
Research training based integration	.30	.11	.29	2.80	.006
Inquiry-based integration	.05	.12	.05	.46	.648

5.5.4.3 Observed differences between China and the UK: How the nexus types that students experience relate to their Motivation from Research-teaching Integration

Statistical predictors in China (20%) explained more variability in Motivation from Research-teaching Integration than the statistical predictors in the UK (13%), indicating experiences of the nexus types had a stronger influence on business school undergraduates' enthusiasm for research and for the discipline in China. Within Programme Integration in China and Research Training Based Integration in the UK were the most important statistical predictor in each country respectively. This suggested that for respondents from both countries, they were motivated to develop an interest in research and in their disciplines with more experiences of a nexus type within the curriculum. Extra-curricular Integration, the shared nexus type being experienced in both countries, was important for Motivation from Research-teaching Integration in the Chinese context but not important in the UK.

5.5.5 Relationships between Beliefs of Importance of Research-teaching Integration and nexus types

5.5.5.1 Relationships between Beliefs of Importance of Research-teaching Integration and the two nexus types experienced in China

In terms of correlations between Beliefs of Importance of Research-teaching Integration and nexus types in China ($F(2,405) = 22.35, p < .001$), as can be seen from Table 5.22, only 10% of the variation in Beliefs of Importance of Research-teaching Integration was accounted for by the two nexus types. Both statistical predictors were positively associated with Beliefs of Importance of Research-teaching Integration, and Extra-curricular Integration was significant at the .05 level while Within Programme Integration was significant at the .01 level. Within Programme Integration also had a higher β value at .24 than Extra-curricular Integration did ($\beta = .12$). Therefore, Within Programme Integration was the more important statistical predictor in predicting the variability in Beliefs of Importance of

Research-teaching Integration in China. Students with stronger beliefs that research-teaching integration was crucial for their learning were associated with more experiences of the two nexus types, especially experiences of Within Programme Integration.

Table 5.22 Regression analysis results: Beliefs of Importance of Research-teaching Integration and nexus types experienced in China

	B	SE B	β	t	p	r²	Adjusted r²
Constant	.00	.04		< .001	-	.10	.10
Extra-curricular integration	.11	.05	.12	2.24	.026		
Within programme integration	.24	.05	.24	4.49	< .001		

5.5.5.2 Relationships between Beliefs of Importance of Research-teaching Integration and the four nexus types experienced in the UK

Regarding correlations between Beliefs of Importance of Research-teaching Integration and nexus types in the UK ($F(4,157)=14.19$, $p < .001$), as presented in Table 5.23, roughly one-fourth (27% and adjusted 25%) of the variation in Beliefs of Importance of Research-teaching Integration was accounted for by the four types together. Research Training Based Integration turned out to be the most important statistical predictor in this model, with significance at the .01 level and a highest β value (.32) among the four statistical predictors. Inquiry-based Integration was significant at the .05 level with a modest β value at .21, making it the second important statistical predictor. Extra-curricular Integration and Academic Interest Led Integration were not significant at the .05 level. Results indicated that in the UK context, business school undergraduates with stronger beliefs of the nexus importance were along with more experiences of Research Training Based Integration and Inquiry-based Integration, particularly more experiences of Research Training Based Integration.

Table 5.23 Regression analysis results: Beliefs of Importance of Research-teaching Integration and nexus types experienced in the UK

	B	SE B	β	t	p	r²	Adjusted r²
Constant	.00	.06		< .001	-	.27	.25
Extra-curricular integration	.00	.07	.00	.01	.999		
Academic interest led integration	.07	.07	.08	1.13	.260		
Research training based integration	.33	.10	.32	3.27	.001		
Inquiry-based integration	.22	.11	.21	2.06	.041		

5.5.5.3 Observed differences between China and the UK: How the nexus types that students experience relate to their Beliefs of Importance of Research-teaching Integration

By examining adjusted r^2 values of China (.10) and the UK (.25), statistical predictors in the UK predicted more than twice the variation in Beliefs of Importance of Research-teaching Integration than statistical predictors in China. This indicated the impact of experiencing the nexus types on Beliefs of Importance of Research-teaching Integration was much higher in the UK than in China. The most important statistical predictors for Beliefs of Importance of Research-teaching Integration were Within Programme Integration in China and Research Training Based Integration in the UK respectively. In other words, students from both countries being in favour of the research-teaching integration were more associated with experiences of within-curriculum nexus types than experiences of Extra-curricular Integration. As for Extra-curricular Integration, the consistent statistical predictor across countries, it was important (but less important than Within Programme Integration) in China and not important in the UK. This indicated more experiences of Extra-curricular Integration tended to relate to stronger Beliefs of Importance of Research-teaching Integration for respondents from China, but not enough statistical evidence supported the links between experiences of Extra-curricular Integration and Beliefs of Importance of Research-teaching Integration for respondents from the UK.

5.5.6 Additional interpretation and descriptive comparisons of the relationships between the ways of nexus engagement and different nexus types

5.5.6.1 Relationships between the ways of nexus engagement and nexus types in China

In the Chinese context, Extra-curricular Integration and Within Programme Integration were more predictive for Awareness of Research and Participation in Research than for the other three ways of student engagement with the nexuses (as shown in Table 5.24). Both statistical predictors were positively associated with each dependent variable and were significant at the .01 level, except for Extra-curricular Integration on Beliefs of Importance of Research-teaching Integration, which was significant at the .05 level (see Table 5.25 in Section 5.5.6.3). Between the two statistical predictors, by looking at their β values from Table 5.14, 5.16, 5.18, 5.20 and 5.22, Within Programme Integration tended to be the more important statistical predictor for four out of the five ways of engaging with the nexus types. The only exemption was for Awareness of Research, in which both statistical predictors appeared roughly equal importance and Extra-curricular Integration had a slightly higher β value (.45) than Within Programme Integration did ($\beta = .43$). Results indicated that both Extra-curricular Integration and Within Programme Integration were important nexus types that positively associated with all the five ways of nexus engagement among business school undergraduates from China. Experiences with the two nexus types would help improve students' Awareness of Research, Participation in Research, perceived Quality of Teaching Delivery, Motivation from Research-teaching Integration and Beliefs of Importance of Research-teaching Integration. Experiences with Within Programme Integration tended to be more important than Extra-curricular Integration for respondents in China in terms of increasing research participation opportunities, improving the perceived quality of teaching and course instructions, illuminating students' passion for research and disciplines, as well as enhancing students' confidence in the importance of the research-teaching integration. Respondents in China considered Extra-curricular Integration as important as Within Programme Integration in raising their overall awareness of research.

Table 5.24 Adjusted r^2 from each regression model of the relationships between nexus engagement and nexus types

Students' Nexus Engagement:	Awareness of Research	Participation in Research	Quality of Teaching Delivery	Motivation from R-T Integration	Beliefs of Importance of R-T Integration
Adjusted r^2					
China	.57	.48	.16	.20	.10
UK	.50	.49	.12	.13	.25

5.5.6.2 Relationships between the ways of nexus engagement and nexus types in the UK

In the UK context, there were four nexus types as statistical predictors, which were Extra-curricular Integration, Academic Interest Led Integration, Research Training Based Integration and Inquiry-based Integration. As displayed in Table 5.24, similar to China, the nexus types in the UK were also more predictive for Awareness of Research and Participation in Research than for the other three ways of student engagement with the nexuses. Different from China, the four statistical predictors in the UK contributed to each way of student engagement with the nexuses differently (as shown in Table 5.25 in Section 5.5.6.3).

In general, Research Training Based Integration appeared to be the most important nexus type positively associated with most of the ways of nexus engagement, including Awareness of Research, Motivation from Research-teaching Integration and Beliefs of Importance of Research-teaching Integration. As explained earlier, Research Training Based Integration was a type based on Healey's (2005) Research-oriented Teaching type, which highlighted understanding of the research processes and promoting research ethos. In Phase 1 focus group interviews, many participants considered the Research-oriented Teaching type the most straightforward type of integrating research and teaching. Therefore, students were more likely to naturally link nexus engagement with experiences from this type.

Inquiry-based Integration was the most important statistical predictor in predicting the variation in Participation in Research, and was also important for Beliefs of Importance of Research-teaching Integration. Inquiry-based Integration was a joint nexus type of Healey's (2005) Research-based Teaching and Research-tutored Teaching type (see Section 5.3.2.2). Respondents from the UK found

that inquiry-based activities and small group tutorials on research-related content tended to give them more opportunities to get involved with research.

Academic Interest Led Integration, the last within-curriculum nexus type in the UK, did not contribute significantly to any of the five regressions. Students might consider this type not to have a noticeable impact on their ways of nexus engagement. However, the results might also be affected by the analysis process. From the UK nexus type EFA in Section 5.3.2.2, Academic Interest Led Integration was constituted by just one item from Healey's (2005) Research-led Teaching type, indicating this type as a statistical predictor might not work as effectively as other types in the following regressions. This was one of the limitations of the analysis. In the UK, Extra-curricular Integration was important for business school undergraduate students' Participation in Research and perceived Quality of Teaching Delivery to some extent. It was interesting to notice that respondents from the UK considered Extra-curricular Integration, not any within-curriculum integration, as the most important nexus type positively influencing their perceived teaching and course delivery quality, including clarity of teaching instructions, practicality of learning content and clear course expectations etc.

5.5.6.3 Additional descriptive comparisons of the relationships between the ways of nexus engagement and nexus types across countries

As shown in Table 5.24 in Section 5.5.6.1, in both countries nexus types were statistically more predictive of Awareness of Research and Participation in Research than of Quality of Teaching Delivery, Motivation from Research-teaching Integration and Beliefs of Importance of Research-teaching Integration. Statistical predictors were slightly stronger in China than in the UK in regard to Awareness of Research, Quality of Teaching Delivery and Motivation from Research-teaching Integration. This indicated experiences with the nexus types were more likely to be associated with these three ways of nexus engagement among business school undergraduates in China than in the UK.

For Participation in Research, nexus types accounted for roughly the same amount of variation in the dependent variable across countries, indicating the impact of nexus types on Participation in Research was very similar between China and the UK. Noticeably, statistical predictors in the UK predicted more than twice of the variation in Beliefs of Importance of Research-teaching Integration than the statistical predictors in China. It suggested that when compared to students from China, students from the UK considered their experiences of the nexus types to be more important for building beliefs about the benefits of integrating research into teaching. On the other hand, in the

Chinese context experiences with nexus types did not influence students' opinions about the importance of research-teaching integration as much.

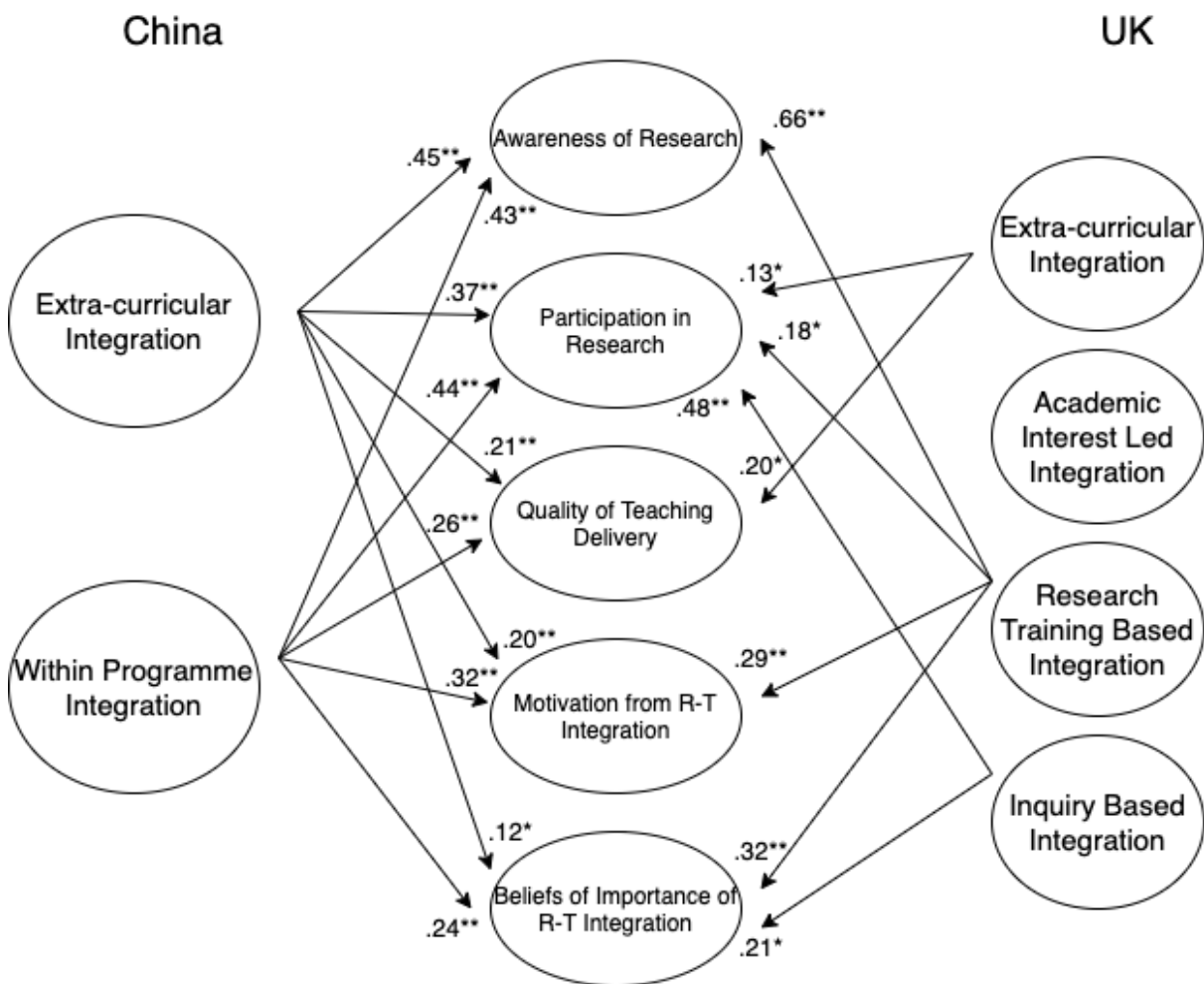
In terms of the impact of each nexus type on different ways of student engagement with the nexuses, as shown in Table 5.25, Extra-curricular Integration and Within Programme Integration were consistently both important for all of the five ways of nexus engagement in China. The impact of each nexus type on different ways of nexus engagement varied in the UK. With possible reasons from the analysis process as explained in Section 5.5.6.2, Academic Interest Led Integration showed no statistical evidence that it was important for any of the nexus engagement ways. The other three nexus types were of different importance regarding different ways of nexus engagement in the UK context. Research Training Based Integration was the most influential nexus type associated with Awareness of Research, Motivation from Research-teaching Integration and Beliefs of Importance of Research-teaching Integration. Inquiry-based Integration was the most important nexus type contributing to Participation in Research, while Extra-curricular Integration was considered the most important type related to Quality of Teaching Delivery.

Table 5.25 The relationships between each experienced nexus type and each way of nexus engagement in China and the UK

		Awareness	Participation	T Quality	Motivation	Beliefs
β values and significance levels						
China	Extra-curricular Integration	.45**	.37**	.21**	.20**	.12*
	Within programme	.43**	.44**	.26**	.32**	.24**
UK	Extra-curricular integration	.09	.13*	.20*	.15	.00
	Academic interest led	.03	.08	.02	.08	.08
	Research training based	.66**	.18*	.20	.29**	.32**
	Inquiry-based	.04	.48**	.08	.05	.21*

Note: *p < .05, **p < .01.

Figure 5.5 Summary of the relationships between the experienced nexus types and the ways of nexus engagement in China and the UK



Note: *p < .05, **p < .01.

Overall, within-curriculum nexus types were considered more important than the extra-curricular nexus for most nexus engagement ways in both China and the UK. Nevertheless, on perceived Quality of Teaching Delivery, respondents from China and the UK had the opposite answers about the importance of within or outside curriculum nexus types. Students in China indicated experiences of Within Programme Integration were more important for enhanced perceptions of teaching and course delivery quality, while students in the UK suggested experiences of Extra-curricular Integration were more important instead.

As the only consistent nexus type experienced by both countries, in general Extra-curricular Integration tended to be more important for student engagement with the nexuses in China than in the UK. In China, Extra-curricular Integration was significant at the .01 level on four of the five ways of nexus engagement, and was significant at the .05 level on Beliefs of Importance of Research-

teaching Integration. In the UK, Extra-curricular Integration was significant at the .05 level on two of the five nexus engagement ways, which were Participation in Research and Quality of Teaching Delivery.

Chapter 6 Discussion and Conclusions

From the perspective of business school undergraduates at research-intensive universities in China and the UK, the previous two chapters have provided empirical evidence showing their experiences of the different types of research-teaching nexus, how they engage with the nexuses, and the relationships between specific nexus types and the ways of engagement. This chapter synthesises the findings from Phase 1 focus group interviews and Phase 2 survey in Section 6.1, as a summary of the answers to research questions. Further discussion of the findings, with an explanation from and comparisons with existing literature, is presented in Section 6.2. In Section 6.3 and Section 6.4, the contributions and limitations of this study are stated. Implications and recommendations for different groups of stakeholders are provided in Section 6.5. Finally, concluding remarks of the whole thesis are presented in Section 6.6.

6.1 Summary of key findings

6.1.1 Types of research-teaching nexus experienced in China and the UK

Phase 1

Based on thematic analysis findings (see Section 4.2), all of the four types within Healey's (2005) research-teaching nexus framework, which are Research-led Teaching, Research-oriented Teaching, Research-based Teaching, and Research-tutored Teaching, have been spotted from experiences of business school undergraduate students at research-intensive universities in China and the UK.

Whilst the students have reflected perceived experiences of elements from all these four nexus types, frequencies of the experiences and levels of familiarisation with specific nexus types vary. For both countries, participants report most experiences with Research-led Teaching, and the specific activities in the experiences across countries are similar. Research-oriented Teaching is considered to be the most explicit type that integrates research into teaching by the participants, especially participants in the UK. Compared to Research-led Teaching and Research-oriented Teaching, student experiences of Research-based Teaching and Research-tutored Teaching appear to be less common across countries, especially for participants from lower years of study.

Besides Healey's (2005) four nexus types, which all focus on research-teaching integration within the curriculum, an additional type Extra-curricular Integration has emerged from the focus group interviews. This study defines Extra-curricular Integration as where students perceive or learn about

any aspects related to research from activities at universities but not within modules. For example, participants from both countries have had experiences with or have noticed opportunities for research-related activities on campus but outside modules, such as research seminars, academic conferences and research projects etc. Participants from China tend to have more experiences and opportunities in regard to Extra-curricular Integration than participants from the UK.

For both countries, slight differences in student experiences of the nexus types among different years of study and programmes are mentioned. In general, participants from lower years of study perceived fewer experiences of the nexuses, and also less in-depth nexus experiences. Participants from accounting-related programmes reported relatively fewer experiences of the nexuses than their peers from economics, finance or management related programmes. More important than the differences in the experienced research-teaching nexus, is the student voice that to what extent they are able to choose among different options of the nexus experiences at research-intensive universities.

Phase 2

In comparison with findings from Phase 1, statistical analysis results of the Phase 2 survey (as presented in Section 5.3) provide slightly different answers about the types of research-teaching nexus experienced by the students.

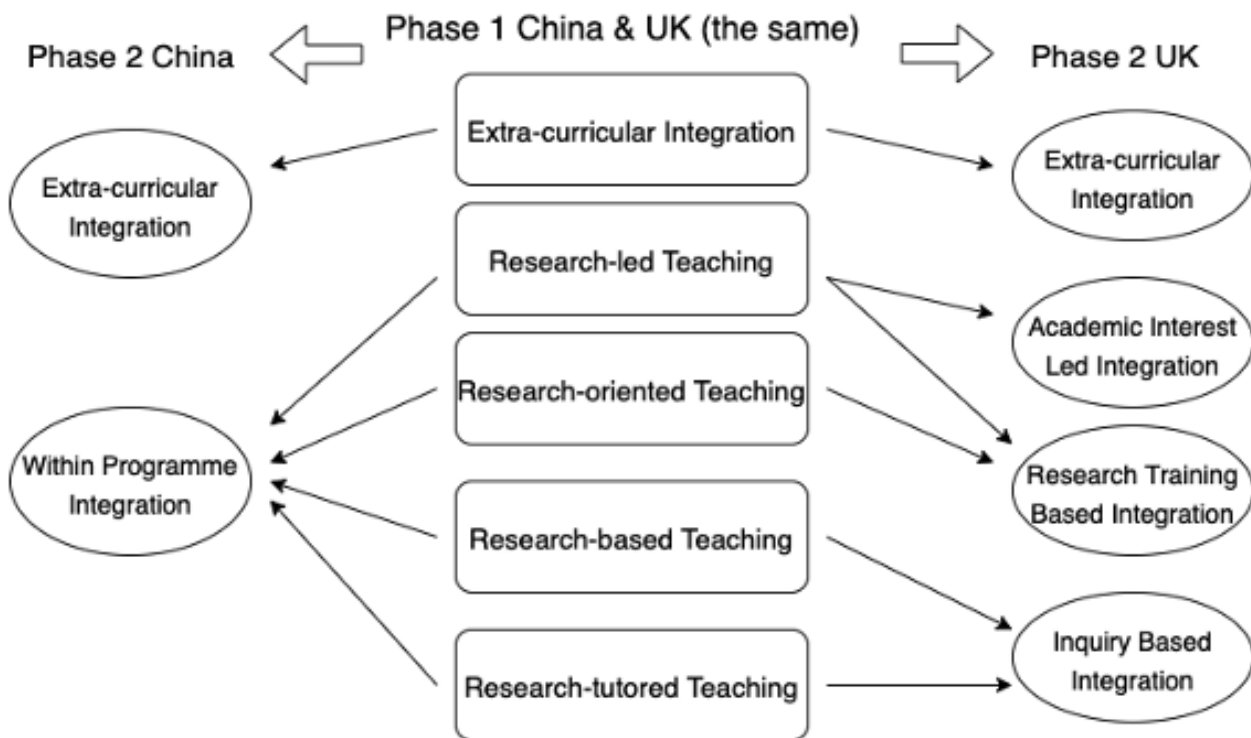
In China, only two nexus types were identified from EFA analysis, which were Extra-curricular Integration and Within Programme Integration. While Extra-curricular Integration from Phase 2 corresponded with the Extra-curricular Integration type spotted from Phase 1, Healey's (2005) four nexus types could not be distinguished and were evident as one joint type: Within Programme Integration. In the UK, four nexus types were identified from EFA analysis, which were Extra-curricular Integration, Academic Interest Led Integration, Research Training Based Integration, and Inquiry-based Integration. The Extra-curricular Integration type in the UK was consistent with Extra-curricular Integration found in China, and was also consistent with the same type identified in Phase 1 (UK). The other three types partially supported Healey's (2005) nexus types framework with new combinations of the types suggested. Academic Interest Led Integration originated from Healey's (2005) Research-led Teaching type, highlighting the importance of lecturers' own research interests in research-teaching integration. Research Training Based Integration was a hybrid type mainly based on Healey's (2005) Research-oriented Teaching with some elements from Research-led Teaching. Inquiry-based Integration was a joint type of Healey's (2005) Research-based Teaching and Research-Tutored Teaching types. Table 6.1 and Figure 6.1 show the nexus types experienced by

business school undergraduate students at selected research-intensive universities in China and in the UK from Phase 1 and Phase 2 analysis.

Table 6.1 A list of nexus types identified in China and the UK from Phase 1 and Phase 2

Nexus Types Identified	China	UK
Phase 1	Extra-curricular Integration	Extra-curricular Integration
	Research-led Teaching	Research-led Teaching
	Research-oriented Teaching	Research-oriented Teaching
	Research-based Teaching	Research-based Teaching
	Research-tutored Teaching	Research-tutored Teaching
Phase 2	Extra-curricular Integration	Extra-curricular Integration
	Within Programme Integration	Academic Interest Led Integration
	-	Research Training Based Integration
	-	Inquiry-based Integration

Figure 6.1 Changes in nexus types identified in China and the UK from Phase 1 and Phase 2



6.1.2 Ways of student engagement with the research-teaching nexuses in China and the UK

Phase 1

As presented in Section 4.3, thematic analysis findings indicate the students engage with the research-teaching nexuses mostly in the ways proposed by Visser-Wijnveen et al. (2016), which are reflection on general knowledge about research (Reflection), gaining information about current research conducted by lecturers and in the discipline (Current Research), participation in research (Participation), perceived quality of teaching and course delivery (Quality), motivation of enthusiasm in research and in the discipline (Motivation), and beliefs of the importance of the research-teaching integration (Beliefs).

Overall, regarding the ways of engagement with the nexuses, participants from China and the UK have displayed more similarities than differences. The similarities are as follows. In terms of Reflection, students from both countries have expressed a range of understanding of what 'research' means in the business school contexts, varying from narrow focuses to broad concepts. Students

have (at least) a basic understanding of the research findings and processes. For Current Research, students are aware of some up-to-date mainstream research in the disciplines as well as lecturers' research, especially lecturers' research output - mainly publications. For Participation, in both countries, differences between individual experiences are shown. While some students rarely actively participate in research-related activities, some students report various research experiences. For Quality, students focus on lecturers' teaching styles, feedback and support, relevancy of the integrated content, practicality, and overall levels of difficulty and workload. For Motivation, intrinsic-motivated students and extrinsic-motivated students are found in both countries. Specifically, for extrinsic-motivated students, their passions for research and the subjects are motivated or discouraged by a range of influences, including but not limited to grades, lecturers' guidance and support, as well as practicality and difficulty etc. In terms of Beliefs, students have expressed divergent opinions about the importance of integrating research into teaching at the undergraduate level in business schools from research-intensive universities. Most participants consider the research-teaching integration important for their learning, whereas some participants (from both countries) consider current research-teaching integration at business schools too much that such integration is unnecessary for undergraduates. It appears that some of the aspects revealed in Quality, Motivation and Beliefs are closely entwined.

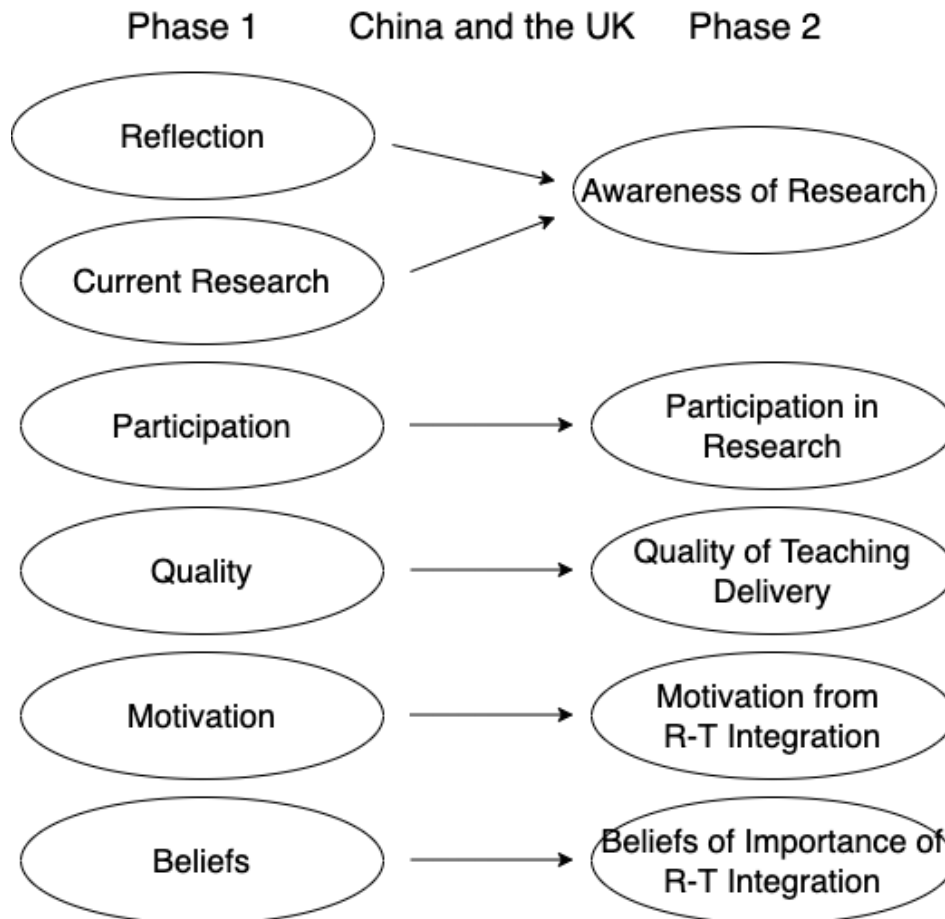
Slight differences in nexus engagement are also revealed between the two countries. In Participation, participants in China have reported more in-depth involvement in research-related activities, for example as (co-)researchers conducting research projects with lecturers or peer students. In terms of Motivation, participants from the UK show relatively more intrinsic motivation. Additionally, peer influence seems to be more important in China regarding Motivation and Beliefs.

Phase 2

As presented in Section 5.4, statistical analysis results from the Phase 2 survey suggest that both China and the UK share the same ways of student engagement with the research-teaching nexuses, with a very similar structure compared to the scales proposed in SPRIQ by Visser-Wijnveen et al. (2016). The results largely echo with findings from Phase 1, too. Awareness of Research, Participation in Research, Quality of Teaching Delivery, Motivation from Research-teaching Integration, and Beliefs of Importance of Research-teaching Integration constitute the five ways how business school undergraduates engage with the nexus types across countries consistently. Awareness of Research combines 'reflection' and 'current research' from Visser-Wijnveen et al. (2016), referring to the general awareness of research-related knowledge, including an understanding of research process and research findings, getting to know lecturers' research, as well

as acquiring information about frontier research in the discipline. The other four ways of nexus engagement remain the same as the counterparts from the SPRIQ (Visser-Wijnveen et al., 2016) and Phase 1 findings, with slight changes in the names for more clarity. Figure 6.2 shows the ways students engage with the nexuses in China and the UK in Phase 1 and Phase 2.

Figure 6.2 Student nexus engagement in China and the UK from Phase 1 and Phase 2



6.1.3 Relationships between nexus types and the ways students engage with the nexuses in China and the UK

Statistical analysis results of the Phase 2 survey (as displayed in Section 5.5) respond to RQ3: Are there any relationships between different nexus types and the ways business school undergraduate students engage with the nexuses at research-intensive universities in China and the UK? As China and the UK experience country-specific nexus types, rather than formal statistical comparisons, this study provides text-based comparisons of the overall importance of nexus types for nexus engagement and of which specific nexus type experiences are more or less important for each way of nexus engagement across countries.

Overall, as displayed in Table 5.24 in Section 5.5.6.1, experiences with the nexus types have a stronger impact on Awareness of Research and Participation in Research than on Quality of Teaching Delivery, Motivation from Research-teaching Integration and Beliefs of Importance of Research-teaching Integration in both countries. Students in China are more likely to associate experiences of nexus types with Awareness of Research, Quality of Teaching Delivery and Motivation from Research-teaching Integration than students in the UK. On the other hand, students in the UK consider experiences of nexus types much more important for Beliefs of Importance of Research-teaching Integration than students in China do. For Participation in Research, the influence of experiences of nexus types is very similar across countries.

Regarding the influence of specific nexus types on different ways of student engagement, experiences with Extra-curricular Integration and Within Programme Integration are always important for all the five ways of nexus engagement in China, whereas in the UK the importance of experiences with Extra-curricular Integration, Academic Interest Led Integration, Research Training Based Integration and Inquiry-based Integration varies in terms of different ways of student engagement (as shown in Table 5.25 and Figure 5.5 in Section 5.5.6.3). In the UK, Research Training Based Integration appears to be the most important nexus type associated with three out of the five ways of engagement: Awareness of Research, Motivation from Research-teaching Integration and Beliefs of Importance of Research-teaching Integration. Inquiry-based Integration is the most influential nexus type related to Participation in Research, and Extra-curricular Integration turns out to be the most important type associated with Quality of Teaching Delivery. Academic Interest Led Integration does not show statistical significance at the .05 level in any way of nexus engagement.

For both countries, within-curriculum nexus types tend to be more important than the extra-curricular nexus for most ways of nexus engagement. One of the exceptions is that in the UK context, students consider Extra-curricular Integration more important than any of the within-curriculum nexus types in regard to perceiving good teaching and course delivery quality. The other exception is spotted in China, as Extra-curricular Integration is slightly more important than Within Programme Integration for Awareness of Research.

Experiences of Extra-curricular Integration, the only consistent nexus type across countries identified from statistical analysis, appear to have a stronger impact on all the five ways of nexus engagement in China than in the UK.

6.2 Overall discussion

In this section, the findings of this study are discussed with comparisons made to the existing literature. Possible reasons for the observed similarities and differences between China and the UK are speculated upon.

6.2.1 Research-teaching nexus types identified in China and the UK

6.2.1.1 Extra-curricular Integration: A new nexus type proposed

In addition to Healey's (2005) nexus framework, which illustrates different types of research-teaching integration within the curriculum, this study reveals a new nexus type: Extra-curricular Integration. Extra-curricular Integration first emerged from Phase 1 focus group interviews, and was also identified in Phase 2 survey consistently across both countries.

Prior to this study, the majority of the existing literature that shed light on the research-teaching nexus had focused on within-curriculum integration. Little attention was paid to research-teaching integration outside the curriculum. Although some scholars had referred to research seminars, posters or academic conference opportunities (e.g. Turner et al., 2008; Spronken-Smith et al., 2014; Davidson and Lyon, 2018) when they talked about within-curriculum integration, the study suggested that research-related activities within and outside curriculum should be distinguished for different pedagogical focuses and designs. This is because within-curriculum integration should be more course relevant, in terms of both content and difficulty. Otherwise, it was likely to poorly cover the curriculum and essential knowledge could not be effectively taught (Clark and Hordosy, 2019). By contrast, integration outside the curriculum can cover a wider range of knowledge and techniques, encouraging more interdisciplinary interactions and interests, as well as pushing the limit of students with outstanding capabilities. Therefore, Extra-curricular Integration stands as an independent nexus type.

The differences in the frequency and depth of Extra-curricular Integration experiences between China and the UK possibly originated from the different postgraduate admission systems. In China, similar to National College Entrance Exam, National Graduate Entrance Examination (NGEE) is the compulsory national exam for postgraduate admissions. The competition in NGEE has gotten increasingly fierce in recent years. It is reported by MOE (2021) that 4.57 million students have registered for the 2022 NGEE. The numbers of applicants for the 2021 NGEE and 2020 NGEE were 3.77 million and 3.41 million respectively (eol.cn, 2021). Meanwhile, a handful number of undergraduates are able to be exempted from the NGEE and go to postgraduate schools via school

recommendations (*Baoyan*). Detailed requirements to be recommended vary across universities and departments. As suggested by Cao and Chen (2016) and Gong, Tan, Bi and Wang (2018), student GPA is usually the base for school recommendations. Active participation in research-related activities is an important way to get bonus credit. Also, in order to help schools make decisions on whom to recommend, there are various research-related competitions organised by the universities or the departments. In these competitions, usually students are guided by academic staff to conduct research projects individually or in small groups. Starting from composing research proposals, students will go through the whole research process including articulating research questions, conducting literature reviews, designing research methods, collecting and analysing data, and composing discussion and conclusions (as introduced by the guidance of an institutional research competition at sampled university CN1). Participating in these competitions not only contribute to bonus credit in the school recommendation process, but also considerably develop students' research capabilities and help build a solid foundation for their postgraduate study and research. Moreover, such experiences will put them in favourable positions in the admission interviews after the NGEE. Therefore, undergraduates in China are highly motivated to participate in extra-curricular research-related activities, and they have relatively easy access to these opportunities. In contrast, because postgraduate admissions are largely application-based, students from the UK perceive less pressure to conduct extra-curricular research projects. There are also fewer related opportunities available at universities in the UK, as suggested by Zamorski (2002) and participants from this study almost twenty years later.

It is worth remembering that all the participants of this study came from research-intensive universities. The particular university type decided that the selected universities had more resources to enable students to experience more Extra-curricular Integration, in comparison to teaching-focused or applied universities. For example, as mentioned by Griffioen (2020), only about 10% of lecturers participated in research in 2018 at her applied university. When there were limited research activities at the academic level, it was difficult for the university to provide more opportunities for students to experience research-teaching nexuses, especially Extra-curricular Integration.

6.2.1.2 Within-curriculum integration: Partially supports Healey's (2005) nexus framework

Presence of Healey's (2005) original types

Regarding within-curriculum integration, evidence from this study showed partial support for Healey's (2005) nexus framework. Each of Healey's (2005) four nexus types (Research-led Teaching,

Research-oriented Teaching, Research-based Teaching, and Research-tutored Teaching) had been recognised in both countries based on thematic analysis from Phase 1 focus group interviews, whereas statistical analysis from Phase 2 survey indicated country-specific and modified types of nexus (see Figure 6.1 in Section 6.1.1).

Phase 1 findings of this study added further empirical evidence to the wide applicability of Healey's (2005) research-teaching nexus framework. In the contexts of business schools at selected research-intensive universities in China and the UK, undergraduate students reported experiences of all the nexus types from the theoretical framework.

Related activities of each nexus type, as revealed by the participants, echoed with many existing literature from various disciplinary and geographical backgrounds. For example, for Research-led Teaching, students learned about frontier research findings in the discipline through additional reading after lectures or through getting to know lecturers' own research projects (e.g. Yuen (2017); Mitchell and Harvey (2018); Abdel Latif (2019); Osnes and Skaug (2019)). For Research-oriented Teaching, students referred to experiences of research methods related modules, data analysis, and data processing software skills (e.g. Leston-Bandeira (2013); Petit et al., (2017); Bottcher and Thiel (2018)). For Research-based Teaching, students were guided to take part in projects based on real-world problems and learned as researchers, or undertook independent research projects like dissertations (e.g. Turner et al., (2008); Willcoxson et al., (2011); Hei et al., (2013); Boyle and Goffe (2018)). For Research-tutored Teaching, students discussed journal articles with lecturers in small groups in tutorials or during lectures (e.g. Van der Rijst et al., 2013). In addition, student experiences indicated that nexus types usually appeared in hybrid forms, just as scholars including Hei et al. (2013), Haaker and Morgan-Brett (2017) and Osnes and Skaug (2019) adopting multiple ways of research-teaching integration in their modules. Despite the various disciplinary and geographical backgrounds, the commonalities shared in student experiences of the research-teaching nexus indicate that the forms of integrating research into teaching can be similar across contexts, and these pedagogical designs can be effectively perceived by most students.

Research-led Teaching and Research-oriented Teaching

Among the experiences of Healey's (2005) nexus types, business school undergraduates from both China and the UK tended to be more familiar with Research-led Teaching and Research-oriented Teaching than Research-based Teaching and Research-tutored Teaching. The findings were also in line with the indications from Griffiths (2004) and Healey (2005), that the former two types provided relatively simple and straightforward ways of integrating research into teaching. In other words, these two types were more likely to be adopted by lecturers and perceived in student experiences.

Referring to Healey's (2005) theoretical framework (as shown in Figure 2.1 in Section 2.5), Research-led Teaching and Research-oriented Teaching remained teacher-centred characteristics and students were still largely as audience. However, these two types can be considered as a good starting point to build the links between research and teaching and encourage student nexus experiences, especially for undergraduate students from lower years of study.

Linking with Clark and Hordosy's (2019) development phases of the nexus, Research-led Teaching and Research-oriented Teaching display typical characteristics of Phase One. For example, the focus of disciplinary knowledge is relatively broad, and experiences of research-related activities are largely guided by lecturers. For junior undergraduates, constrained by the hierarchical knowledge structure (Robertson and Bond, 2003; Jenkins, 2004), it can be very difficult or even discouraging to take on nexus experiences at higher levels. Although in the contexts of economics and business, hierarchies of disciplinary knowledge might not be as steep as in some hard pure disciplines, it would be always prudent to start from Phase One (Clark and Hordosy, 2019) and lay the foundation first.

Research-led Teaching and Research-oriented Teaching can also be friendly to students with less developed academic capabilities, no matter which academic year they are in. As suggested by some participants of this study, some Research-based Teaching tasks were too challenging and only a handful of students were able to accomplish them. In this case, Research-based Teaching might not be as effective as lecturers expected. Instead, Research-led Teaching or Research-oriented Teaching could possibly help optimise student nexus experiences with given average student capabilities, and help students build up capabilities and research interests by going through earlier phases of the nexus (Clark and Hordosy, 2019).

Research-based Teaching and Research-tutored Teaching

Although less commonly reported, Research-based Teaching still constituted an important part of the student nexus experience, especially for students from senior years of study. Participants' experiences of participating in literature-based case studies, simulating real-world problem-solving, and completing dissertations demonstrated the student-centred approach and the characteristics of students as participants from Healey's (2005) theoretical framework. These experiences also showed that students were moving towards Clark and Hordosy's (2019) Phase Two and Phase Three. The focus of disciplinary knowledge was narrowing down, and research-related activities were becoming more problem-based, creative, and generative.

Discoveries from Phase 1 of this study that business school undergraduates did not reach agreed opinions when talking about their experiences of Research-based Teaching (as presented in Section

4.2.3) were different from the findings of Ball and Mohamed (2010) but similar to the findings of Abdel Latif (2019). In Ball and Mohamed's (2010) study, most participants who studied hospitality management at a less research-intensive university in the UK considered Research-based Teaching (44%) and Research-tutored teaching (38%) as their most preferred nexus types. In Abdel Latif's (2019) study, contrasting ideas were expressed in terms of satisfaction with Research-based Teaching and Research-tutored Teaching experiences. Among the postgraduate participants taking a computer-assisted language learning course at a Saudi university, some students were in favour of Research-based Teaching and Research-tutored Teaching, while a few students clearly stated being disappointed at their experiences of these two nexus types.

In the current study, student satisfaction with each nexus type was not included in the research questions. Nevertheless, focus group participants did express some opinions about specific nexus types when sharing related experiences. These opinions also reflected student beliefs of the importance of the nexus (see Section 6.2.2). In the contexts of business schools at research-intensive universities in China and the UK, there was most argument among the undergraduates regarding Research-based Teaching experiences. Two main streams of undergraduate attitudes were identified from both countries. Many students with Research-based Teaching experiences acknowledged that these experiences might be challenging at first, but rewarding upon completion. Their positive feedback echoed Ball and Mohamed (2010), and could reinforce the beliefs held by many academics (e.g. Griffiths, 2004; Healey 2005; Boyle and Goffe, 2018). The academics believed that Research-based Teaching could provide fruitful sources for undergraduates to engage with research-related activities more deeply and help students gain wider benefits, for example possibly improved attainment or improved passion for research and their disciplines.

Nevertheless, not a small number of participants reviewed their Research-based Teaching experiences with negative feelings. For one reason, which echoed Neumann (1994) and Abdel Latif (2019), some participants found that this type of integration was demanding and required more effort from both lecturers and students. When there was insufficient input from either side for any reason, student nexus experiences might be not very pleasant. For another reason, some participants questioned the necessity of such in-depth research-teaching integration for undergraduates, even at research-intensive universities. These voices are valuable and deserve further exploration.

In the existing literature, most reported negative student experiences towards the research-teaching nexuses came from perceived compromised teaching quality, overdemanding difficulty or feeling distant from research (e.g. Robertson and Blackler, 2006; Turner et al., 2008; Spronken-Smith et al.,

2014; Clark and Hordosy, 2019). The issue that some students perceive excessive research-teaching integration unnecessary is rarely raised. For research-intensive universities, integrating research into teaching seems to be one of their natural advantages in facilitating student learning, and it is also their obligation to provide students with research-integrated teaching (Russell Group, 2018). This idea might also apply to the majority of students at research-intensive universities, including students from previous studies (e.g. Jenkins, 2004; Miulescu, 2019; Vereijken et al., 2020) and some participants from the current study. However, as presented in Section 4.3.6, part of the participants did not expect too much in-depth research-teaching integration at the university. The notion of 'research-intensive universities' did not matter to them. They decided to come to the selected universities just because these universities had good league table rankings. When they applied for universities, not all A-level/middle school students understood that league tables were usually largely based on research-related performance. Some students aimed at career development upon finishing their undergraduate study, and considered that studying at good universities would put them in favourable places in the job market. Experiences of Research-based Teaching sometimes turned out to be overwhelming, especially when the students perceived the specific integration activities/contents were less practical for careers. It could be argued that the students might have overlooked the possible development of transferrable skills in the process of research-integrated teaching, which could be indeed helpful for their careers. Nevertheless, from the perspective of research-intensive universities and lecturers within, should they provide more options for students to what extent their research-teaching nexus experiences would be? This needs further investigation and points out possible directions for future research. After all, as Zamorski (2002) stressed, students are not homogeneous at any university.

Some country-specific experiences related to Research-based Teaching and Research-tutored Teaching came from the differences in the education systems and curriculum designs. For instance, participants from the UK indicated that perceived experiences and difficulties of Inquiry-based tasks jumped too much between academic years. This might be because students are usually expected to complete undergraduate study in three years in the UK, and semesters are relatively shorter. In China, it normally takes four years to acquire a bachelor's degree and semesters are relatively longer. Consequently, students from China are more likely to gradually build up nexus experiences while students from the UK have to take bigger steps.

China participants tended to have fewer Research-tutored Teaching activities than their peers from the UK. Seminars or workshops after lectures are common teaching activities in the UK, whereas lectures remain to be predominating teaching activities for undergraduates in China. Nevertheless,

as introduced by participants from China, sometimes they also had research-integrated activities in groups during lectures. This suggests that for undergraduate programmes at research-intensive universities in China, whilst usually seminars/workshops are not clearly set in curricula, tutoring activities are still taking place.

Regarding dissertations, one of the most important academic activities that combined elements from all of Healey's (2005) nexus types, differences were revealed between the two countries as presented in Section 4.2.3. At selected universities in China, dissertation completion was compulsory for all business school programmes. In the UK, students from some programmes were allowed to have their own choices of whether to take dissertations. Given the argument over the appropriate depth of research-teaching integration for undergraduates and the advocacy from the students for more available pathways at research-intensive universities, it is also possible for future studies to look into the influence of the dissertation options on student nexus experiences.

Adapted nexus types

From Phase 1 to Phase 2, there were noticeable changes in the nexus types experienced by business school undergraduate students at research-intensive universities in both China and the UK. In the Chinese context, Healey's (2005) nexus types could not be differentiated and all four types were combined as one nexus type: Within Programme Integration. In the UK context, student experiences proposed adapted nexus types based on Healey's (2005) framework. As a reminder, Academic Interest Led Integration originated from Healey's (2005) Research-led Teaching. Research Training Based Integration type was a hybrid of the original Research-led Teaching and Research-oriented Teaching. Inquiry-based Integration combined Healey's (2005) Research-based Teaching and Research-tutored Teaching types.

It is not surprising to see the changes in nexus types identified from the two phases of the study. For one reason, different research methods and data analysis approaches were employed in Phase 1 and Phase 2. Phase 1 thematic analysis started with a more theoretical-driven approach (Braun and Clarke, 2006). With a specific interest in presence of Healey's (2005) nexus types, deductive coding was conducted first in the process of searching for themes. Participant experiences displaying any aspect of each Healey's (2005) type were recognised by the researcher and mapped onto corresponding nexus type experiences. In Phase 2 statistical analysis, as a data-driven approach (Fabrigar et al., 1999), EFA identified the latent formation of the nexus types perceived from respondent experiences.

For another reason, and most importantly, one same module or a single research-related activity might have hybrid types of nexus. For example, completing dissertations contained elements from all four types. In China, replicating lecturers' research projects combined Research-led Teaching, Research-oriented Teaching and Research-based Teaching. In the UK, Research-led Teaching, Research-based Teaching and Research-tutored Teaching were spotted at the same time when the participants talked about seminars or tutorials following case studies in lectures. As mentioned earlier, such findings of existing hybrid nexus types were not at odds with previous studies (e.g. Hei et al., 2013; Haaker and Morgan-Brett, 2017; Osnes and Skaug, 2019). As Healey (2005, p.70) himself put it, '*few curricula fit entirely in one quadrant*'. Healey and Jenkins (2009) also advocated for these hybrid types. They believed that combining elements from different types of integration could contribute to more effective teaching activities. Therefore, the adapted nexus types identified from Phase 2 did not mean demolishing Phase 1 findings, but suggested actual combinations of the types in the experiences of business school undergraduates at research-intensive universities from China and the UK.

For China, there are four possible reasons speculated for why Healey's (2005) nexus types cannot be distinguished. First, the students perceived their research-integrated teaching activities as containing elements from all four types. With no standing-out features of any specific type spotted, the students considered all the Healey's (2005) types as a whole combination. Second, due to different education systems and cultural backgrounds, Healey's (2005) theory might not be fully applicable in the contexts of Chinese business schools at the selected research-intensive universities as it was originally developed in disciplines of geography and built environment (Griffiths, 2004) in the UK. Third, as suggested by Zamorski (2002), students might not fully realise the research-teaching nexus they were experiencing or engaging with. The participants possibly did not recognise the specific nexus types they experienced. Fourth, there were also chances that some meanings of the theoretical framework were not fully conveyed in the process of being adapted to questionnaire items and translation. Further research is recommended to investigate the presence and applicability of Healey's (2005) nexus framework in the Chinese context.

For the UK, it was more likely that the adapted nexus types indicated the actually perceived combinations of Healey's (2005) types in business school undergraduate experiences at the selected research-intensive universities. For example, from the perspective of the students, getting to know research findings (theoretically Research-led Teaching) was together with understanding the research process and accepting disciplinary research culture (theoretically Research-oriented Teaching), providing basic training for students to be able to learn as researchers. This formed the

adapted type of Research Training Based Integration. It was in line with Visser-Wijnveen et al. (2016), who also found that students did not distinguish research process and research product, and considered them a whole thing. Research-based Teaching and Research-tutored Teaching were combined into Inquiry-based Integration. As Healey (2005) introduced, in Research-based Teaching activities, the two-way interactions between research and teaching were highlighted and the division of roles between lecturers and students was blurred. It was likely that the participants perceived such stronger interactions with lecturers and became more active participants rather than audience in small group tutorials. They were also likely to carry out inquiry-based activities in tutorials, or considered research discussion related tutorials themselves as inquiry-based activities. This helped explain how the adapted Inquiry-based Integration encompassed Research-based Teaching and Research-tutored Teaching together. Nevertheless, the same as in China, Item 2.1 from the questionnaire which referred to Research-led Teaching was excluded in the EFA of nexus types in the UK due to relatively poor internal consistency. Consequently, the adapted Academic Interest Led Integration only represented one questionnaire item that was concerned with lecturers designing modules based on their own research interests. In terms of relationships with different ways of nexus engagement, the analysis of Academic Interest Led Integration was limited (as shown in previous Section 5.5 and later Section 6.2.3). Whilst this is considered as a limitation of the current study, further exploration of questionnaire Item 2.1 and the relationships between academic research interests and student engagement with the nexuses is recommended.

6.2.2 Student engagement with the research-teaching nexuses in China and the UK

Mostly in line with the SPRIQ (Visser-Wijnveen et al., 2016), this study revealed how business undergraduate students engaged with the research-teaching nexuses at research-intensive universities in China and the UK. For both countries, while thematic analysis from Phase 1 focus group interviews identified all the six aspects proposed by SPRIQ, statistical analysis from Phase 2 survey suggested a more condensed structure that combined the original 'Reflection' and 'Current Research' into one same way of engagement: Awareness of Research. The other four ways of nexus engagement remained the same as they were in SPRIQ with slight changes in the names, which were Participation in Research, Quality of Teaching Delivery, Motivation from Research-teaching Integration and Beliefs of Importance of Research-teaching Integration. Noticeably, regarding the ways that students engage with the nexuses, China and the UK appeared to be more similar than dissimilar throughout Phase 1 and Phase 2, especially in Phase 2. This section is organised based on the Phase 2 structure (five ways of nexus engagement) with elucidation mostly based on Phase 1 findings.

6.2.2.1 Awareness of Research (Awareness)

Encompassed 'Reflection' and 'Current Research' from SPRIQ (Visser-Wijnveen et al., 2016), Awareness of Research indicated student understanding of research, assimilation of research findings and research processes, as well as notification of lecturers' research and up-to-date research in the discipline. As indicated by Zamorski (2002), how students defined 'research' would influence how they understood or perceive the research-teaching nexuses. Similar to Zamorski's (2002) findings, the definition of research varied among the business school undergraduate students at research-intensive universities in China and the UK. Echoing with the wide spectrum of academic understanding of research as presented in Section 2.2.1 (e.g. Truscot, 1951; Carter 1980; Lindsay and Neumann, 1988; Sun and Chen, 2006; Tennant et al., 2010; Wang et al., 2014), Phase 1 participants of this study also provided different opinions about what 'research' meant from narrow to broad perspectives.

The comparisons of the understanding of 'research' between academics and undergraduates help remind the possible gaps in the cognitions of research, and of the research-teaching nexus between academics and undergraduates. For some students, the definition of 'research' could be as specific as journal articles or quantitative models. If they only see fragmented elements of research, their perceptions of the research-teaching integration can be distorted and different from the lecturers' intention. An example would be the mismatch between lecturers' goal statements of research-integrated teaching and student experiences in Van der Rijst et al.'s (2013) study. While the students' understanding of 'research' is largely influenced by their years of study and levels of intellectual attainment and intrinsic interest in research, the understanding evolves when students make progress in their learning. Correspondingly, academic staff and universities need to be cautious when making assumptions about students in nexus related pedagogical or curriculum designs. More challenging than simply avoiding overestimating or underestimating average student levels is to understand and respect the diversity in student understanding of 'research'.

Students assimilated with knowledge about research findings and research processes from both within the curriculum and extra-curricular activities. While this assimilation remains at relatively surface levels of engaging with the nexuses, as students are more like 'information recipients', the basic knowledge provides elementary guidance on what is academic research in the disciplines. It helps undergraduate students build solid fundamental knowledge about research, and encourages further student engagement with the research-teaching nexuses.

Similar to previous study findings (e.g. Turner et al., 2008; Spronken-Smith et al., 2014), in general, students from this study were aware of lecturers' research within business schools and frontier research information in the disciplinary area. The degree of familiarisation with staff research was largely depending on academics' choices of to what extent they would like to integrate their own research into undergraduate teaching. While the majority of participants from both countries got to know lecturers' research via their publications as extra reading materials or monographs as textbooks, it appeared that students in China had more in-depth opportunities to assimilate with staff research. Examples included replicating a lecturer's research project at CN1 and participating in lecturers' research as research assistants at both CN1 and CN2. It tended to be common that undergraduate students in the UK were relatively far away from research, even at research-intensive universities. For example, at a UK research-intensive university, some students mentioned that their lecturers or tutors considered they could not conduct proper research as undergraduates, and even research seminars were only available for postgraduates (Zamorski, 2002). In the study focusing on final-year undergraduates with international institutional comparisons conducted by Turner et al. (2008), zero of the approximately 50 respondents from a UK research-intensive university had acted as research assistants, whereas 17% of the respondents from a Canada research-intensive university had owned research assistant experiences. More discussion about undergraduate participation in research is presented in the following Section 6.2.2.2.

In Phase 2 statistical analysis, slight differences between the countries were spotted regarding assimilation with lecturers' research. In China, respondents clearly considered it as Awareness of Research. In the UK, respondents perceived it as either Awareness of Research or Participation in Research (see Section 5.4.1.2 and Section 5.4.2.2). Translation issues and cultural differences were speculated as possible reasons for the differences. The three questionnaire items (Item 3.21-3.23) indicating differences came from SPRIQ (Visser-Wijnveen et al., 2016), and SPRIQ was initially developed in Dutch. While Visser-Wijnveen et al. (2016) also provided an English version, some meanings of the original items might have subtly changed a little bit. Before employing SPRIQ in the Chinese and English contexts, the researcher of this study carefully adjusted some wording based on pilot testing interview results. For example, 'scientific research' in the original SPRIQ was changed to 'academic research'. In terms of the Chinese version, although it was translated and back-translated by different persons (the researcher and a secondary school English teacher) to improve consistency, minor changes or loss in meanings were still inevitable. With linguistic and cultural differences, respondents from China and the UK were likely to approach and perceive the same item slightly differently.

6.2.2.2 Participation in Research (Participation)

In the existing literature, undergraduate students were usually considered excluded from research participation at HEIs (e.g. Zamorski, 2002; Brew, 2006; Tam, Heng and Jiang, 2009). Encouragingly, in this study, business school undergraduates at research-intensive universities from both China and the UK indicated active participation in research-related activities. The number of participation opportunities and depth of participation varied in individual experiences and were also slightly different across countries, though.

As shown in Section 4.3.3, it appeared that participants from China reported more in-depth participation in research activities, either conducted by their lecturers or by themselves. Meanwhile, not all undergraduate students at the sampled business schools in the UK were going to have dissertations, whereas dissertations were compulsory at both of the selected business schools in China. The differences were considered partly related to the different levels of research pressure (for both lecturers and students), which originated from the different education systems and policies across countries.

As discussed in Section 6.2.1.1, the NGEE admission system and school recommendations motivate undergraduate students in China to be actively involved in research activities. It can be also understood in the way that undergraduates in China are under more pressure to participate in research. While their research participation is voluntary, to some degree the participation is goal-oriented, which is to earn bonus credit for school recommendations and to get exempted from the NGEE. In the meantime, at Chinese research-intensive universities like Double First Class universities, lecturers are still heavily urged by institutional and national policies to produce research output (e.g. Zhang and Shin, 2015). Thus, lecturers would need research assistants to accelerate the project progress, and also assist in the considerable number of postgraduate research projects. It has been common for a long time that lecturers to cooperate with postgraduate students (especially PhDs) in research projects, and more undergraduates have started to participate in lecturers' research in recent years as reflected by the participant experiences.

Contrastingly, research pressure for undergraduates in the UK is much less. Some students would like to participate in research in more depth but find limited opportunities or support at the university. For example, a student from Zamorski's (2002) participated in a summer research programme as work experience, as he/she could not find related research opportunities within the university. The UK participant from UKFG1-5, who submitted an academic paper to an undergraduate research conference, expressed dissatisfaction about the lack of support when

he/she contacted lecturers in the school. For academics in the UK, it is not necessarily that they have less research pressure, as tensions between research and teaching have also been reported (e.g. Coate et al., 2001; Schulz, 2013). More importantly, academics' attitudes towards undergraduate research participation largely influence to what extent they would like to invite or welcome undergraduate students to be involved in research.

As disciplines in social sciences, the nature of knowledge in EFAM subjects tends to be more like 'Mode 2 knowledge' (Gibbons et al., 1994), which is perceived as practical problem oriented, infused in sources, as well as contextual and interdisciplinary based. The hierarchies in the disciplinary knowledge structure are also relatively flat, compared to the highly hierarchical knowledge structure in pure and hard disciplines. In such applied and soft disciplines, more shared participation and engagement should be encouraged (Robertson and Bond, 2003). As suggested by the scholars, '*the disciplinary community*' is constructed by both academic staff and students, and they participate in '*(de)construction of knowledge*' together (p.13). Likewise, as advocated by Boyer (1990), the four categories of scholarship should be tied inseparably. Student participation in disciplinary research helps contribute to the mutual enhancement of scholarship of discovery and scholarship of teaching. Therefore, besides encouraging undergraduate students to take part in research activities, their participation needs to be valued by the lecturers and universities.

6.2.2.3 Quality of Teaching Delivery (Teaching Quality)

Quality of Teaching Delivery is discussed from two angles, the lecturers and course content. Regarding lecturers, teaching styles as well as feedback and support are the key aspects of students' nexus engagement. For course content, relevancy, practicality, and overall difficulty are considered important by the students.

As defined by Kaplan and Kies (1995), 'teaching style' is about a lecturer's '*personal behaviours and media used*' (p.29) in the interaction process with the students. By bringing thinking styles into teaching, Zhang and Shin (2015) categorised teaching styles into three types. Type I was concerned with more creative, adaptive and student-centred teaching, whereas Type II was concerned with more conservative, normative, and lecturer-centred teaching. Type III referred to a contingent approach in that lecturers made adjustments in their teaching depending on specific contextual requests. In Phase 1 focus group interviews, where participants from both countries talked about teaching styles or lecturers' personal charismas, it appeared that the Type I teaching style (Zhang and Shin, 2015) was more popular among the students and helped promote the research-teaching integration. While the Type I teaching style itself tended to correspond with Inquiry-based activities,

lecturers who displayed Type I characteristics seemed to be more compelling in the teaching process. Thus, students were more devoted to research-integrated activities.

Echoed with Tam et al. (2009) and Clark and Hordosy (2019), lecturers' feedback and support was perceived as crucial characteristics that either encourage or constrain student from engaging with research-teaching nexuses. In both countries, participants highly appreciated in-time and sufficient feedback from lecturers in the research-integrated learning process. Nevertheless, relatively more unpleasant experiences related to insufficient feedback and support were reported. Such experiences reflect the common doubts over the effective integration that lecturers could not prioritise both research and teaching at the same time. It is just not very realistic given the multitasks undertaken by lecturers with limited time and effort (e.g. Jenkins et al., 1998; Coate et al., 2001; Bak and Kim, 2015).

Taking the 'boomerang' metaphor from the UKFG2-5 participant, teaching, especially research-integrated teaching needs to be a more interactive and iterative process. Feedback is considered a checking point for both lecturers and students to understand their positions in the teaching-learning process and make adaptations if needed. Particularly, research-integrated activities usually demand more effort and time input from the students (and lecturers). If much effort has been made from the student side and no proper feedback from the lecturers is received, it would be more discouraging than no feedback in traditional teaching, like rote learning. Meanwhile, being more intellectually challenging, research-integrated activities can hardly be effective without appropriate academic support and scaffolding. It was interesting to see that when a CNFG1-3 participant mentioned that his/her Inquiry-based Integration tasks were lack of support, he/she said the same sentence (originally in Chinese) as a participant said from Clark and Hordosy's (2019, p.423) study in the UK, '*Where do I start?*'. Therefore, student-centred learning should not be like throwing people who cannot swim into water and leaving them struggling to survive. Like swim rings, clear instructions and heuristic guidance are necessary for undergraduate students to properly start and gradually deepen their research-integrated learning.

While previous studies reported students usually found research-integrated teaching practical and helpful for solving real-world problems (e.g. Spronken-Smith et al., 2014), students from this study did not always consider the integration practical or closely relevant to their study. The levels of relevancy and practicality influenced participants' reviews of related research-teaching integration experiences, and also linked with Motivation and Beliefs which are discussed in the following sections. Sometimes, it could be because of the relatively far distance between frontier research in the discipline and the current knowledge base of undergraduates (Jenkins, 2004). It requires the

lecturers to carefully assess the suitability of the research content being integrated into undergraduate teaching. At departmental or institutional levels, content consistencies and connections between different modules should also be taken into account. If some knowledge is mentioned once and is never seen or used again throughout the whole university study, students can hardly consider it relevant or practical. Specifically, while many knowledge and skills within the EFAM subjects are closely related to work and life, some obscure research-integrated materials used by lecturers might make students feel difficult to understand and perceive them as not practical.

From the student perspective, appropriate overall difficulty and reasonable workload of the research-integrated activities would improve their nexus experiences. Nevertheless, it was difficult to define what was the appropriate difficulty and workload in practice. Similar to the argument over the necessity of in-depth research-teaching integration for undergraduate students (see Section 6.2.1.2), one-sized integration could barely fit all given the diversities in student intellectual development, expectations of study outcomes, and time and effort allocation among different responsibilities etc. Options, as frequently mentioned by focus group participants from both countries, might be possible solutions. Some challenging research-integrated activities can be set as optional tasks. When students have completed the challenging tasks, distinguishable rewards should be provided to acknowledge their performance and encourage further engagement. It does not have to be extra marks as suggested by some participants, but should be evident. For example, lecturers can produce reference letters for the students, or give them priorities in research-related opportunities.

6.2.2.4 Motivation from Research-teaching Integration (Motivation)

As Breen and Lindsay (1999) explained, students have intrinsic and extrinsic motivation in terms of learning. Students who are intrinsically motivated usually pursue knowledge understanding itself, with fewer utilitarian objectives. Students who are extrinsically motivated are more likely to learn contingently upon various external reasons. In this study, students also indicated intrinsic and extrinsic motivation in terms of research-teaching integration.

A small number of the participants, especially from the UK, displayed strong intrinsic motivation to learn through research-integrated activities. As observed by the researcher, these students were very much researcher-like, or they could be considered junior researchers already. Because of their intrinsic interest in research and outstanding academic capabilities, no matter whether they appreciated or complained about their nexus experiences at university, they expressed high levels of passion and willingness to learn more about disciplinary knowledge as well as research.

Meanwhile, for most participants from both countries, they tended to be more extrinsically motivated in research-teaching integration. Their interest in the disciplines and research would be motivated or discouraged by their perceived nexus experiences. Therefore, it is important to understand which characteristics of the research-teaching integration can help students establish interest or boost their enthusiasm for study. Besides Teaching Quality related factors as discussed above, particularly, assessments and grades in research-integrated teaching need attention.

It is widely known that with Confucian tradition, education systems in China are heavily exam-based (Shin, 2012). It might not be strange to see many participants in China express concerns about assessment and marks when talking about research-integrated teaching. Somehow surprisingly, nine out of the twelve UK focus groups also clearly mentioned that marks would influence their interest in the research-teaching integration. In traditional assessment, course assignments or exams tend to be more memorising-based. While they are boring and also time consuming in preparation, they are less intellectually challenging. The criteria for marking are clear and consistent, too. Contrastingly, participants from the study perceived many '*uncertainties*' (UKFG2-6) regarding inquiry-based assessment, especially without clear instructions or sufficient feedback. Participants from both countries suggested that they were more willing to engage with research-teaching integration if the activities were not connected with assessment, at least not 100% related to the final marks. Also, similar to participants from Fuller et al.'s (2014) study, some participants from the current study did not like those research-integrated tasks that occupied too much time and negatively affected their preparation for other assignments or exams. Additionally, it would demotivate student interest in research, if they can score high in memorisation-based assessments with relatively less intellectual input but receive low scores when they have contributed much intelligence and time. While Breen and Lindsay (1999) found that students who expected higher marks tended to have negative attitudes towards research, lecturers can contingently balance the 'noble inquiry ethos' and 'vulgar pursuit of grades' (adapted from quotes in CNFG2-1) in integrating research into teaching. If students today are still largely marks-driven, research-integrated teaching can also utilise grades as the incentive to promote student interest in research and the disciplines.

6.2.2.5 Beliefs of Importance of Research-teaching Integration (Beliefs)

From the perspective of undergraduate students, who study in business schools at research-intensive universities, divergent opinions are revealed about the importance of research-teaching integration for their study within each country. Echoing most academics who hold firm beliefs that the nexus between research and teaching is important - at least important for improved teaching if not important for both research and teaching enhancement (e.g. Neumann, 1992; Rowland, 1996; Li

et al., 2015), and many students from the previous student-focused nexus experiences studies (e.g. Fuller et al., 2014; Spronken-Smith et al., 2014; Osnes and Skaug, 2019; Clark and Hordosy, 2019), most students in this study acknowledge the importance and benefits of integrating research into teaching in their learning process. They find research-integrated teaching more intellectually stimulating and helpful for developing a deep understanding of disciplinary knowledge. The integration also provides basic training in research techniques and skills which will support their dissertation completion and future study as postgraduate students if applicable. In addition, some of the research-integrated activities are more interesting than traditional lectures. The students are motivated to be more active learners and develop further interest in the disciplines and research.

On the other hand, some participants perceived excessive research-teaching integration of which importance is overemphasised for their learning, and the students do not think they need such amount or depth of the research-teaching integration. This is different from the frequently seen comments for negative attitudes towards the nexus, which come from the competing relationship between research and teaching due to lecturers' limited time and effort. From the perspectives of both academics and students, the scarcity of resources usually leads to overemphasising research at the cost of compromised input for teaching in practice (e.g. Jenkins et al., 1998; Coate et al., 2001; Turner et al., 2008). In the aforementioned circumstances, the lecturers only focus on their own research and do not sufficiently integrate research into teaching for students. Nevertheless, the participants of this study might find their lecturers integrating research into teaching 'too' sufficient. Similar to the findings of Clark and Hordosy (2019), some students have less intrinsic interest in research and would like to start working upon finishing their undergraduate education. For example, several participants from accounting and finance related programmes in China mentioned that they preferred spending more time preparing for qualification exams outside the curriculum, which were directly linked with job hunting. It is also in line with Hu et al.'s (2019) findings that students from English majors in China have considered acquiring language qualifications more important than participating in research-related activities. Besides different study or career plans, students also have divergent individual ways of learning. For example, although student-centred teaching is widely claimed as superior to teacher-centred teaching in many regards, some participants still perceive teacher-centred teaching as more effective for building a solid foundation of essential disciplinary knowledge. The participants consider the research-teaching integration, especially in-depth integration, not that necessary for study at the undergraduate level. While it might be considered biased or outdated opinions today that undergraduates do not need research, especially at research-intensive universities, it turns out that some undergraduates do perceive research as not essential for their learning.

More importantly, whether the participants support the importance or necessity of the nexus or not, all of them have suggested that for undergraduate study, teaching should be regarded as the base and the integrated research elements as an auxiliary medium. Also, available options for different integration levels have been advocated by the participants throughout almost every focus group interview in both countries. From the perspective of academics, Brown and McCartney (1998) indicated that when academics have autonomy over the learning content and methods, and generate new knowledge in the learning process, their own learning can help bond research and teaching together. Correspondingly, while undergraduate students are less concerned with generating new knowledge in study, their attitudes towards the importance of the nexus will be different if they have more autonomy to decide to what extent research is integrated into teaching. It might be difficult for the lecturers, departments and universities to take care of too many individual demands in the massification of higher education, but realising the problems is still better than overlooking or trying to conceal them.

Furthermore, many participants reinforce the statement that a good researcher neither equals a good lecturer, nor equals making good integration between research and teaching. As undergraduate students value teaching more, their evaluation of the nexus importance is also contingent on the perceived actual integration quality. Therefore, what matters to the students is not simply requiring the academics who conduct research to undertake more teaching responsibilities. Essentially, an effective research-teaching nexus is built upon an optimised synergy between research and teaching at appropriate levels of relevancy, practicality, and difficulty.

6.2.3 Relationships between nexus types and the ways of nexus engagement in China and the UK

It is worth remembering that only the Phase 2 survey responds to RQ3 about the relationships between nexus types and the ways students engage with the nexuses. Whilst Phase 1 focus group interviews are not designed to investigate this research question, some discussions from Phase 1 participants are referred to in order to help explain the results from the Phase 2 survey.

6.2.3.1 Relationships between the overall nexus experiences and the ways of nexus engagement

Business school undergraduate students at research-intensive universities in China and the UK perceived nexus experiences positively contributing to different ways they engaged with research-teaching integration. At the overall level, student experiences of all types of research-teaching

nexuses showed a stronger impact on Awareness of Research and Participation in Research than on Quality of Teaching Delivery, Motivation from Research-Teaching Integration and Beliefs of Importance of Research-Teaching Integration in both countries. Reflecting Neumann's (1992) tangible connections between research and teaching and Clark and Hordosy's (2019) direct output of pedagogical implementation and curriculum design, Awareness and Participation represented direct and quantifiable student engagement with the nexuses. It was also relatively straightforward for students to perceive the improvement in Awareness and Participation as they gained experiences with any type of the nexuses. The findings were in line with many other nexus studies with student focuses, which reported increased student awareness of research-related concepts or activities and increased student participation in research (e.g. Turner et al., 2008; Spronken-Smith et al., 2014; Osnes and Skaug, 2019).

On the other hand, Teaching Quality, Motivation and Beliefs reflected the intangible aspects of the research-teaching nexus by Neumann (1992). As important as the tangible connections, however, the intangible connections indicated the more subtle and qualitative attributes in the research-teaching integration. In addition to the fact that it was less straightforward for students to 'measure' the changes in Teaching Quality, Motivation and Beliefs, there were also more other factors mediating student perceptions of these three ways of nexus engagement. For example, Clark and Hordosy's (2019) pointed out that students also engaged with the nexuses contingently based on emergent personal interests, career plans and related policies in the wider contexts. Building onto Clark and Hordosy's (2019) implications, Phase 1 of this study suggested several more mediating factors, including but not limited to the expectation of study outcomes, peer atmosphere, and traditions in ways of teaching and learning etc. Therefore, in general, the relationships between nexus experiences and Teaching Quality, Motivation and Beliefs are relatively moderate.

As for country comparisons, in terms of Awareness, Teaching Quality and Motivation, the impact of nexus experiences was stronger for students in China than for their peers in the UK. Possibly, it can be explained by the considerable transformation in the ways of teaching and learning from secondary schools to universities in China. Typically, rote learning has been predominating in Chinese secondary education for a long time (Hu et al., 2014). Very much NCEE-oriented, high school students memorise and practise exam-based questions repeatedly. Students usually just follow what teachers instruct. Whether they (both students and teachers) like it or not, there is not much space for any in-depth reasoning of the taught content or investigating anything irrelevant to NCEE under extremely high pressure from all levels, including individual students, parents and teachers, institutional admission rates, and regional admission scores (the cut-off points). The ethos of inquiry

and innovation is largely absent⁷. Nevertheless, as Neumann (1992) suggested, nurturing abilities of critical thinking is fundamental in university teaching. While Neumann is a scholar based in Australia, her idea also applies in the context of Chinese research-intensive universities today. For business school undergraduates in China, experiences of different nexus types at university dramatically transformed the ways of teaching and learning compared to their experiences in secondary schools. The emphasis on critical thinking and the inquiry nature of learning was relatively fresh and motivating for them than the undergraduates in the UK, who were relatively more familiar with inquiry-based learning since secondary education (e.g. Jerrim, Oliver and Sims, 2020). Thus, the influence of nexus experiences tended to be stronger on Awareness, Teaching Quality and Motivation in China than in the UK. A quote from a focus group participant from China might help further evident the above speculation:

I remember that every question in high school had a fixed routine to solve, and we were trained like *'bot[s]'* (originally in English). I quite like now we solve the problems as really *'problem-based'* (originally in English). I feel much more interested and more willing to solve these problems and projects. (CNFG1-2)

By contrast, the impact of nexus experiences on Beliefs was much stronger in the UK than in China. It is worth remembering the results do not necessarily suggest students in China consider research-teaching integration less important than their peers in the UK, but the experiences of the different nexus types are less influential in their opinions about whether or to what extent the nexus is important. As explained above, Beliefs of Importance of Research-teaching Integration is perceived as an intangible aspect of the research-teaching nexus, and it tends to be mediated by a wide range of factors such as future study or career plans, intrinsic interest in research, perceived practicality, and peer atmosphere etc. As can be seen, some of these factors related to Beliefs were entwined with factors related to Teaching Quality and Motivation.

Possibly, the impact of the above mediating factors largely exceeds the impact of the nexus-type experiences on Beliefs in China. In other words, business school undergraduate students in China tend to hold more built-in beliefs about the importance of research-teaching integration. The built-in beliefs can either support or oppose the nexus. The point is that the beliefs are already so firmly established that no matter what nexus-type experiences are like, they will not make a difference in

⁷ In most recent years, 'quality-oriented teaching' has been re-emphasised by MOE of China and more secondary schools (mainly leading middle schools in big cities) have developed inquiry-based activities (e.g. Lv, 2021).

the students' beliefs. For example, in the Phase 2 survey, 86% of the respondents in China expressed a clear intention to pursue postgraduate study whereas the corresponding number in the UK barely reached 30% (as displayed in Appendix D). In addition, considering the pressure from NGEE and competitions in school recommendations as described earlier in Section 6.2.1.1, students in China are more likely to consider the nexus necessary and helpful for their future study plan. Therefore, regardless of what nexus types they experience or whether the experiences are pleasant, the students will consider the nexus important as 'inelastic demand'.

Perceived differences in peer atmosphere might be another possible explanation for the different impact of nexus-type experiences on Beliefs between China and the UK. Three out of the six focus groups in China indicated that peer attitudes and team atmosphere would influence their overall attitudes towards research-teaching integration, while only two of the twelve focus groups in the UK mentioned peer support in teamwork. To a certain degree, undergraduates in China tend to have closer relationships with classmates than students in the UK. At Chinese universities, the majority of the students live in university dormitories and usually four to six students share the same room. As the students almost study and live together 24/7, peer atmosphere plays an important role in many aspects of their university experiences. In addition, because lacking critical thinking and independent thinking training in secondary education (Hu et al., 2014), undergraduate students in China, especially those in lower years of study, are more likely to be influenced by the opinions and attitudes of their peers around.

The above speculation is considered a prompt for an open thread. As limited literature and data have shed light on the relationships between nexus experiences and student beliefs about the nexus importance in the Chinese context, future research is suggested to look into student attitudes towards the research-teaching nexus and related factors in China. The impact of the transition from rote learning to research-integrated teaching deserves further exploration, too.

Last but not least, while it appeared that participants in China had more opportunities to participate in research activities in-depth (as presented in Section 4.3.3 and Section 6.2.2.2), the impact of the experienced nexus types on Participation in Research almost equalled across countries. This was because in the questionnaire, Participation related items were asked in frequencies and the options ranged from 'never' to 'always' (see Appendix C). Students only responded with their frequencies of participation without detailed information such as the depth or contributions in the participation process. Therefore, as a part of Neumann's (1992) tangible connections and Clark and Hordosy's (2019) direct outcomes of pedagogical and curriculum development, Participation is positively associated with nexus experiences, and the association is relatively straightforward and less

influenced by other factors. Possible reasons for all the similarities between China and the UK are explained in detail in Section 6.2.4.

6.2.3.2 Relationships between the specific nexus types and specific ways of nexus engagement

It appeared that both Extra-curricular Integration and Within Programme Integration were consistently important for all five ways of nexus engagement in China, whereas the impact of each nexus type differed on different ways of nexus engagement in the UK (see Table 5.30). In general, nexus experiences tended to be more stimulating for business school undergraduate students in China. For one reason, as explained in Section 6.2.3.1, the considerable transition from typical rote learning in secondary schools to research-integrated teaching at the university possibly boosted different ways of student engagement with the nexuses. For another reason, in terms of within-curriculum integration, statistically, no differentiation was identified in China and all of Healey's (2005) four nexus types were combined as one type: Within Programme Integration. Contrastingly, experiences of within-curriculum integration were categorised into three nexus types in the UK. It was also possible that the stronger impact of the within-curriculum nexus types in China partly came from the overall wider ranges of nexus experiences counted.

Amongst all the experienced nexus types in the UK, Research Training Based Integration showed statistical significance in predicting Awareness, Participation, Motivation and Beliefs, and was considered the most important type associated with Awareness, Motivation and Beliefs. In Phase 1 focus group interviews, participants from the UK considered Healey's (2005) Research-oriented Teaching the most straightforward nexus type experienced, and usually referred to research methods modules first when talking about their noticed integration between research and teaching. Largely based on Research-oriented Teaching (Healey, 2005), it is speculated that from the student perspective, Research Training Based Integration also provides the most direct connections between research and teaching, as the teaching content are mainly about what is research and how to conduct research. As typical examples of Research Training Based Integration, research methods modules enable students to gain knowledge about research processes and findings, methodological issues, as well as research skills, which are closely related to Awareness of Research. Meanwhile, in line with previous studies (e.g. Hei et al., 2013; Leston-Bandeira, 2013; Petit et al., 2017), most participants of this study considered the research methods modules helpful and practical, especially those who were undertaking or planning to undertake dissertations. As indicated by a participant from UK2,

My programme doesn't have a dissertation option but I want to have one after the Stata module (not the exact module name). Dealing with numbers was fun, not that difficult as I thought. (UKFG2-6)

In this way, experiences of Research Training Based Integration help stimulate student interest and confidence in research-related activities, which is related to Motivation. Moreover, as discussed in Section 6.2.3.1, perceived relevancy and practicality of the specific research-teaching integration content will influence student Beliefs about the importance of the nexuses. As research methods modules are part of curriculum designs, Research Training Based Integration is highly relevant to the curriculum study. The basic research concepts and skills taught in Research Training Based Integration are also widely applicable. For example, they can help students better understand journal articles in additional readings from any module. Rather than simply knowing what is done in the studies, the students are able to reflect on how the studies are conducted and even why they are conducted in specific ways. For students who are compulsory or planning to complete dissertations, experiences of Research Training Based Integration provide direct support for composing the methodology chapter. With such relevancy to study and practicality in many aspects, Research Training Based Integration was also the most important type for Beliefs of Importance of Research-teaching Integration in the UK.

In the UK, Inquiry-based Integration, which combined Healey's (2005) Research-based Teaching and Research-tutored Teaching, was the most important nexus type associated with Participation and was also related to Beliefs. Participation included both student involvement in research activities and perceived values of their involvement. Echoing other scholars like Healey and Jenkins (2009), Ball and Mohamed (2010) and Fuller et al., (2014), students become more active participants in the learning process in Inquiry-based Integration. More than just '*consumers*' of knowledge, students are being involved as '*producers*' of knowledge, too (Healey and Jenkins, 2009, p.23). As discussed earlier in Section 6.2.1.2, Research-based Teaching is considered a more advanced level or developing phase of research-teaching integration (Clark and Hordosy, 2019). It is usually more challenging for the students and requires more effort and time input from both students and academic staff. Whilst being challenging, most students find such nexus experiences rewarding, as the undergraduate students perceive not only improved levels of participation in research but also an acknowledgement of their participation. This is how experiences of Inquiry-based Integration contribute to Participation and Beliefs. Nevertheless, different from the studies conducted by Ball and Mohamed (2010) and Fuller et al., (2014), no statistically significant association was found between Inquiry-based Integration and Motivation in this study. Aside from the different research

focuses and designs, another possible reason is speculated that some challenging aspects of Inquiry-based Integration could inhibit students' interest in research, as suggested by some Phase 1 participants. These different opinions might have blurred the relationships between Inquiry-based Integration and Motivation in the context of the current study.

Extra-curricular Integration was associated with Teaching Quality and Participation in business schools at selected research-intensive universities in the UK. Somehow surprisingly, instead of any within-curriculum nexus, Extra-curricular Integration was considered the most important type that positively related to perceived Teaching Quality in the UK. It was also different from China, where Within Programme Integration was perceived as more important than Extra-curricular Integration in regard to Teaching Quality. Experiences of Extra-curricular Integration are largely voluntary based (especially in the UK), and students with an intrinsic interest in research or higher intellectual development are more likely to engage with Extra-curricular Integration. Because their capabilities exceed the average levels in the student cohorts, these 'good students' might have a clearer understanding of lecturers' instructions and course objectives. They tend to have fewer problems with course difficulty levels and required workload. In this way, the positive association between Extra-curricular Integration and Teaching Quality might partly come from the biased group of students. As limited research has focused on the research-teaching nexus in extra-curricular activities, future studies also are suggested to investigate Extra-curricular Integration and its importance in different ways of nexus engagement.

In this study, Academic Interest Led Integration did not show statistically significant associations with any nexus engagement. It was partly contradictory to Phase 1 findings, as some participants suggested that they decided their dissertation topics as inspired by some lecturers' research topics. In previous studies, for example, Fuller et al., (2014) and Haaker and Morgan-Brett (2017), students also expressed perceived benefits from teaching incorporated with lecturers' research projects. As explained in Section 5.5.6.2, it might be because respondents actually did not perceive Academic Interest Led Integration important for their engagement with the nexuses. More likely, however, the results were affected by the particular statistical analysis process. Academic Interest Led Integration was constituted by a single item from Healey's (2005) Research-led Teaching. It possibly affected the effectiveness of analysing the relationships between nexus engagement and Academic Interest Led Integration as a nexus type.

At the overall level, within-curriculum nexus types were more important than Extra-curricular Integration in terms of most ways of nexus engagement. It suggests that within-curriculum research-teaching integration remains the core nexus experiences for business school undergraduate students

at research-intensive universities in both China and the UK. As the only consistent nexus type across countries, Extra-curricular Integration was considered more important for student nexus engagement in China than in the UK. As discussed earlier in Section 6.2.1.1, under the NGEE and school recommendation admission system, students in China tended to be more motivated to participate in Extra-curricular Integration activities and there were more Extra-curricular Integration opportunities provided at university or in the department. In Extra-curricular Integration activities, students in China were more likely to conduct research projects as active researchers by themselves or in groups. In comparison, participants from the UK shared more Extra-curricular Integration experiences as interviewees or questionnaire respondents in research projects conducted by others, acting as a relatively passive role. A few UK participants (e.g. UKFG1-5) also mentioned when they tried to carry out research-related activities outside modules, not enough support was found from their lecturers or the university. With more depth and width in Extra-curricular Integration experiences in China, it is understandable the impact of these experiences is stronger in different ways of nexus engagement.

6.2.4 Possible explanation of the similarities between the countries

As can be seen from the above sections, China and the UK shared many similarities in the perceived experiences of the nexus types, the ways how students engaged with the nexuses, and the relationships between the experienced nexus types and the ways of nexus engagement. It might be somehow surprising that ancient China and the medieval western world had already displayed similarities in philosophies of teaching and research. Whilst teaching was the pillar function at both Taixue in China and universities in the UK, the idea of knowledge-practice oneness by Confucius and the philosopher Yangming Wang and the western collegiate nature supported the integration of research into teaching (e.g. Lindsay and Neumann, 1988; Delanty, 1998; Xiao and Li, 2014; Chen, 2018). In fact, collegiality and ethos of inquiry were seen in Confucianism, too. Although it was widely known that Confucianism advocated respecting and obeying seniors and teachers, Confucius also emphasised the importance of teachers co-investigating and critical reflecting with students (Shim, 2008; Tam et al., 2009; Hu et al., 2014). In the process, teachers continuously thrived through discussion with students, and students learned through critical debates and discussions with teachers as well as with peer students.

Moving onto modern times, as suggested by Hu et al., (2014) and Hou and Wen (2018), western ideas had considerably influenced higher education in China. Dating back to the establishment of modern Chinese universities in the early 20th century, university models from Germany and the US were largely borrowed and the Humboldtian ethos was valued. Given the relatively slow acceptance

of Humboldtian ideas in the UK (Lindsay and Neumann, 1988), it appeared that China and the UK accepted Humboldtian concepts at similar time points. For China, the subjects of Economics and Business Management were also largely imported from the West. Core theories in the discipline were mostly invented by western academics and have been taught at business schools in China for a long time. For example, as mentioned by Phase 1 participants, many textbooks were written by western scholars. Sometimes they used textbooks written by their lecturers, and lecturers interpreted the western theories.

Meanwhile, in the past few decades, globalisation, massification and marketisation have yielded a great impact in the higher education context worldwide (Ouyang, 2004; Robertson and Bond, 2005; Brown and Carasso, 2013; Li et al., 2015). Despite different historical origins and national education systems, HEIs from both China and the UK, especially research-intensive universities with profound historical statuses, become increasingly similar in many aspects. In terms of research, whilst Russell Group universities from the UK have established a long-time worldwide renowned reputation, Double First Class universities from China have been rapidly chasing up (Xie and Freeman, 2019). As the title of 'Double First Class' suggests, these research-intensive universities in China aim at building first-class universities and disciplines of the world. They are aligning with international standards which are largely set by the UK and the US. It is totally not the same picture as portrayed about two decades ago, when some heavy critics were raised over Chinese HE that professors taught out-of-date knowledge in a virtuoso way of teaching, producing undergraduates with a rigid understanding of knowledge, poor creativity and incompetent skills at the global market (Pain, 1990 as cited in Tam et al., 2009; Li and Tang, 2004; Yao, 2005). At least these descriptions are not seen at the selected Chinese research-intensive universities. Many lecturers at Double First Class universities have overseas studying or exchanging experiences, attending international academic conferences, and publishing in influential international journals. In addition, while the UK universities have had academic staff with multiple cultural or ethnic backgrounds for long (Turner, 2006), the two selected Chinese research-intensive universities have also employed foreign lecturers or guest professors to teach undergraduates at business schools, as introduced by the focus group participants from China. Hence force, at both institutional and individual levels, the closer international connections within academia bring more shared academic beliefs and more similar scholarly activities across China and the UK. As the value of research and the importance of integrating research into teaching have been emphasised in both countries, it is not odd to witness the similarities in student experiences of the nexuses.

Additionally, for students themselves, most participants of this study from both countries were born around the millennium. They have grown up in a flattened world (Friedman, 2005). They are able to simultaneously acquire and exchange information with people from the other side of the Earth. The students are not only exposed to different cultures (Tam et al., 2009), but also live in some globally shared cultures (Hou, Montgomery and McDowell, 2010). For example, when sharing experiences of research-related case studies, most focus group participants from China used the word 'case study' in English instead of in Chinese. It was also interesting to hear participants across countries talking about cases of the same multinational enterprises. Furthermore, from some informal conversations with the participants outside the interviews, it happened that participants from China and the UK mentioned the same hit movie. In other words, the increasing globalisation within and outside the HE context has encouraged more similarities in the mindsets and values of the students. Therefore, students are likely to perceive and engage with the various nexus types in similar ways across countries.

6.3 Strengths and key contributions of the study

The current study has its strengths and makes original contributions to knowledge in the following aspects. First of all, to the best knowledge of the researcher, this is the first study that operationalises research-teaching nexus experiences and engagement from the student perspective in the Chinese context. Among the studies published in English, only a handful of nexus studies investigate the Chinese higher education context (Hei et al., 2013; Hu et al., 2014; Li et al., 2015; Zhang and Shin, 2015; Chen, 2018; Hu et al., 2019). Two of the studies were conducted by the same group of researchers and mainly focused on the same Chinese university, which further limited the width in the Chinese context. It is noteworthy that all of the above studies have focused on the academic perspective. Among the domestic Chinese publications related to the research-teaching nexus, most articles are talking about authors' personal opinions and suggestions without any supporting empirical evidence. As the first study that unveils the student perspective of the research-teaching nexus in China, the current study explicitly demonstrates the nexus types experienced by business school undergraduate students at two Double First Class universities, the ways they engage with the experienced nexuses, and the relationships between the nexus types and the ways of engagement. By applying the widely-accepted Healey's (2005) nexus framework and Visser-Wijnveen et al.'s (2016) SPRIQ and involving a large number of participants, the theoretical basis and empirical evidence are both solid.

Second, the study provides a comprehensive description of the undergraduate research-teaching nexus experiences and engagement in business schools at research-intensive universities in both China and the UK from three aspects: the experienced nexus types, the ways of nexus engagement, and the relationships between the nexus types and engagement. Regarding the first two aspects, the findings of the current study further evidence the existing theories of Healey's (2005) nexus-type framework and Visser-Wijnveen et al.'s (2016) SPRIQ, and extend their applications to a new geographical context: China. Investigation into the relationships between the nexus types and the ways of engagement can hardly be found in the existing literature. This study makes original contributions by indicating which nexus types experienced by the students are particularly important for which ways of their nexus engagement. Aside from narrowing the gaps in the literature, these findings also provide practical references for empirical pedagogical practice.

Third, the study presents text-based comparisons between China and the UK of the business school undergraduate nexus experiences and engagement. As summarised in the Literature Review, cross-country comparisons are rarely seen in the existing student-focused nexus studies (e.g. Turner et al., 2008). The comparisons between China and the UK are novel. It is worth remembering that this study is not a formal comparative study as explained in Section 3.3.2, and does not intend to make sample to population generalisation of its findings. Instead, the study honestly introduces the similarities and differences found across the countries, and discloses many details in the research process such as the selection of the sample university and participant recruitment, additional comments on the quotations of the focus group interview participants, and evaluations among different choices in data analysis etc. The thick descriptions provide rich information for the readers to fully understand the undergraduate research-teaching nexus experiences and engagement in particular settings: within business schools at research-intensive universities in China and the UK. The readers are also allowed to make their own decisions about to what extent the findings can be referred to or transferred to their own contexts (case-to-case transfer; Punch & Oancea, 2014).

Fourth, based on both Phase 1 focus group interview and Phase 2 survey results, the study proposes a new nexus type in addition to Healey's (2005) framework, which is Extra-curricular Integration. In the existing literature, within-curriculum and extra-curricular research-teaching integration are not distinguished and the latter is under-represented. This study identifies and suggests Extra-curricular Integration as an independent nexus type, providing new insight into understanding and practising different types of research-teaching nexus both theoretically and empirically. Conceptually, Extra-curricular Integration supplements and is distinct from Healey's (2005) four nexus types. As discussed in Section 6.2.1.1, Extra-curricular Integration has different characteristics from within-

curriculum integration and has its unique advantages in developing positive undergraduate nexus experiences and engagement. The distinction between within-curriculum and extra-curricular integration helps further clarify different focuses in nexus research and practice, and enables tailored research plans or pedagogical solutions.

Fifth, the two-phase sequential mixed methods research design with a pragmatic approach addresses the research aims and research questions appropriately (Cohen et al., 2011; Punch and Oancea, 2014). It provides both width and depth in the view of the business school undergraduate experiences of, and engagement with, the research-teaching nexus. Both generic characteristics and detailed illustrations are presented in the study, enabling the readers to grasp a holistic comprehension of the topic as well as to understand particular details. Meanwhile, investigating the same issue from different approaches helps improve the robustness of the research findings (Firestone, 1987). The large sample size (especially in China) contributes to the trustworthiness of the study. This is a solid piece of research added to the existing literature that sheds light on the student perspective of the research-teaching nexus.

Sixth, implications and recommendations are provided for different stakeholder groups in the global higher education sector, including academics as lecturers, departmental and university managers, regional and national educational policymakers, and fellow researchers who are interested in the research-teaching nexus topic. In addition, three key recommendations are highlighted: more communication and interactions between lecturers and students in research-integrated teaching, increasing flexibility in the curriculum, and widening undergraduate Extra-curricular Integration opportunities. The key recommendations focus on the crucial stakeholder groups and are considered quick but effective solutions to enhancing undergraduate nexus experiences and engagement.

To summarise, the current study provides novel and authentic materials for understanding undergraduate research-teaching nexus experiences and engagement in business schools at research-intensive universities in China and the UK. The findings elaborate the theoretical construction and contextualised empirical evidence of the research-teaching nexus, contributing to narrowing the research gaps in the literature and illuminating educational practices in the real world.

6.4 Limitations of the study

Admittedly, the current study has several limitations. The cross-sectional study design presents a static drawing of the student nexus experiences and nexus engagement at a certain point. It cannot

effectively display the dynamic, active and affective characteristics of the research-teaching nexus in student experiences and perceptions (Clark and Hordosy, 2019). Although briefly mentioned in the findings, the differences among the students from different academic years, programmes, and intentions about postgraduate study are not analysed in detail. This is partly because comparisons between different demographic groups are not directly related to the research questions of the current study. However, it is aware that considering undergraduate students as a whole homogeneous group will affect the accuracy of understanding their experiences of, and engagement with, the research-teaching nexus.

In the questionnaire design, Item 2.1 (*Teaching focused on information transmission of subject contents*), which explains one aspect of Healey's (2005) Research-led Teaching type, seems to be not well-constructed. In reliability tests of the nexus types related items for both China and the UK samples (see Section 5.3.1.1 and Section 5.3.2.1), Item 2.1 showed poor internal consistency and was excluded in the following EFA and regression analysis in both countries. While excluding Item 2.1 improves the reliability of the study, internal validity is inevitably affected at some degree. For example, in the regression analysis, the Academic Interest Led Integration type in the UK did not perform as an effective statistical predictor in any of the regressions on nexus engagement. Very likely, this is because Academic Interest Led Integration was formed by a single item from Healey's (2005) Research-led Teaching, as Item 2.1 (one of the three items describing the Research-led Teaching type) was taken out and the other item (Item 2.3) joined into Research Training Based Integration type. The problem of Item 2.1 is also related to the lack of pilot studies (except for the pilot testing interviews) validating the questionnaire before the formal survey partly due to time constraints. Nevertheless, the research aims of the study do not include developing or validating the questionnaire, and all other items have displayed good internal consistency.

In terms of data collection, the survey responses from the UK were much fewer than the counterpart from China (UK: 162; China: 408). To a certain degree, it might bring potential bias or some inaccurate text-based comparisons. Also, for Year 1 students who participated in the focus group interviews in China and who responded to the questionnaire in the UK, they only had university experiences for one semester when the data were collected. Consequently, their experiences of the nexus types and nexus engagement were relatively limited.

Because regression analysis only presents associations and does not reveal causal relationships, conclusions and interpretations regarding the relationships between the experienced nexus types and nexus engagement need to be made with caution. While they are positively related, more experiences of a certain type of nexus type does not necessarily mean it is the experiences gaining

students' perceived nexus engagement, or vice versa. Meanwhile, as not enough statistical evidence from the Phase 2 EFA results is shown to distinguish sub-types of within-curriculum nexuses in China, potential further in-depth understanding of the relationships between nexus engagement and specified nexus types within the curriculum is restrained in the Chinese context. Descriptive comparisons regarding within-curriculum nexus types across countries are not allowed, either.

Any transfer of the findings of the current study should be made with careful attention. This study has a particular focus on undergraduate students, business schools, research-intensive universities, as well as China and the UK. Even for the same student groups, disciplinary areas, type of university, and countries, participants of this study cannot represent the whole cohort.

6.5 Implications and recommendations

6.5.1 Implications for academics as lecturers

Lecturers can be considered the most important gateways in student experiences of, and engagement with, the research-teaching nexus. Lecturers' beliefs about the nexus are shaped by their epistemological and ontological beliefs as well as beliefs about the nature of disciplinary knowledge (Robertson and Bonds, 2003). Therefore, essentially, lecturers need to carefully reflect on their own understanding of and attitudes towards research, teaching, and the research-teaching nexus. Whilst it can be still challenging to balance research and teaching and often many other administrative or service tasks in practice, the study suggests that academics can reinforce their beliefs about Boyer's (1990) 'scholarship' to integrate and synergise different roles in their academic lives. If scholarship of discovery (research), scholarship of integration (cross-discipline interactions), scholarship of application (practice), and scholarship of teaching (teaching) are recognised as a whole thing, the psychological barriers among these different aspects are destructed. Then, research and teaching are no longer seen as separate or even mutually exclusive tasks, but as inclusive and can be mutually supportive. Neumann (1992) explained that research develops the depth of knowledge in teaching, and teaching helps complement the width of knowledge for research. Once these beliefs have been built, academics are able to focus on how to (better) integrate research into teaching and encourage more pleasant and rewarding student nexus experiences and nexus engagement.

Academics as lecturers need to constantly review and improve their teaching competencies, no matter to what extent they are integrating research into teaching. Besides providing clear instructions, the contents and skills of teaching should be updated from time to time. Students can

hardly learn effectively from lectures in which lecturers only read slides written decades ago (e.g. Tam et al., 2009). Although the theories themselves might be developed decades ago without any changes, understanding and interpretation of the theories must have advanced over the years. In other words, the curricular knowledge might not be new, but lecturers' deliveries of the knowledge should be up-to-date, including but not limited to choices of supporting materials, forms of classroom activities, and usage of auxiliary technology.

In the process of implementing research-integrated teaching, several key points are highlighted based on the findings of the study. First, given the possible gaps between lecturers' pedagogical designs and actual student experience, lecturers need to understand or assess the current knowledge and skill levels of the students. For students with different levels of intellectual development, particular nexus types are considered to be more effective and motivational in student learning than other types.

For example, for students from lower academic years, nexus types that represent the more entry-level phases in research-teaching integration are recommended, such as Research-led Teaching and Research-oriented Teaching (Healey, 2005; Clark and Hordosy, 2019). With appropriate levels of difficulty and workload, students are able to thoroughly absorb the knowledge and get prepared to smoothly move towards more advanced integration, such as Research-based Teaching (Healey, 2005) or Inquiry-based Integration.

Second, besides student levels, lecturers are suggested to design and practice different hybrids of Healey's (2005) nexus types contingently upon modular content. Within the same discipline or even the same module, knowledge can be approached in different ways. In the infinite situations in practice, lecturers are able to make the most authoritative decisions on to what extent and how research can be integrated into teaching.

Third, in regard to within-curriculum nexuses, the research content that is integrated into teaching should be closely relevant to curriculum knowledge and practical. It helps improve students' perceived Quality of Teaching Delivery, Motivation from Research-teaching Integration, and Beliefs of Importance of Research-teaching Integration. It also helps solve the problem of inefficient and insufficient coverage of the curriculum as reported by Clark and Hordosy (2019). Specifically, in terms of practicality, the integrated research content is suggested to provide a timely reflection on and insights into issues in reality. Meanwhile, the integrated research content is encouraged to help develop students' transferrable skills that are applicable across modules, disciplines and different stages in their entire lives.

Fourth, lecturers' sufficient feedback and support are particularly important in research-integrated teaching. For one reason, students need appropriate scaffolding in the process of familiarising themselves with research or inquiry-based activities, in order to make sure the learning is effective and encourage further engagement. For another reason, the research-teaching nexus (especially Research-based Teaching) itself promotes mutual reinforcement between research and teaching (Healey, 2005). As feedback and support are also part of the interactions with students, lecturers can learn in the process, too. Additionally, lecturers can stimulate a learning environment with peer support.

Last but not least, lecturers are recommended to provide more opportunities for undergraduate participation in research activities within and outside the curriculum, and allow students to choose from different options. As suggested by Robertson and Bond (2003), in disciplines with less hierarchical knowledge structure like in the business school context, a disciplinary community is expected to be built upon shared participation and engagement from both academics and students. Sometimes, lecturers should have more confidence in undergraduates' determination and capabilities of contributing to research, and help with these 'research-active' students in terms of research opportunities, supervision, and other resources. Meanwhile, lecturers also need to understand and respect the diversity in students, including but not limited to different study or career plans, areas of interest, and levels of intellectual development etc. If the research-teaching integration is practised in a unified and compulsory form, experiences and motivations are likely to be negatively affected for many students.

6.5.2 Implications for institutional managers and policymakers

Labelled as '*the global nexus*' by Neumann (1992, p.166), departments and whole universities also participate in shaping the research-teaching nexus. For departmental and institutional managers and policymakers, recommendations are provided from the perspectives of within-curriculum and extra-curricular research-teaching integration and academic staff reward system.

Regarding within-curriculum integration, the research-teaching nexus can be promoted with improved flexibility of the curriculum. A highly fixed curriculum would limit the research content and forms of research activities that can be integrated into teaching (Hu et al., 2019). While essential disciplinary knowledge might be relatively fixed at the undergraduate level, there is still room for more curriculum flexibility. For example, the proportions of compulsory and optional modules are adjustable. For optional modules, more inter-programme or interdisciplinary modules are suggested to be available and encouraged. Possibly, with increased interdisciplinary modules, the disciplinary-

specific research-teaching nexus is affected. Nevertheless, as disciplinary knowledge at business schools tends to be Mode 2 Knowledge (Gibbons et al., 1994) which is more multi-disciplinary based, some interdisciplinary research-teaching nexus can also be considered part of the disciplinary nexus. Country-specifically, as the participants from the UK have mentioned the considerable gaps across academic years, more student options in the curriculum can also help smooth the steep steps, as students are allowed to design a more customised curriculum structure based on individual intellectual development and demands. In China, research methods and skills are currently mostly taught in dissertations or scattered modules (e.g. Econometrics). More specific research methods modules are proposed and recommended to be optional and available to students across disciplines.

As for Extra-curricular Integration, more in-depth research participation opportunities are recommended to be available for undergraduate students, especially at research-intensive universities in the UK. With the considerable amount of research funding and contracts received (Russell Group, 2018), research-intensive universities like Russell Group universities have more advantages in building an inclusive and shared research community engaged by both academics and students. Undergraduates should not be excluded, and their intrinsic or nurtured passion for research should be protected and further stimulated through these Extra-curricular Integration activities. As discussed in Section 6.2.1.1, Extra-curricular Integration can be more intellectually challenging than within-curriculum integration. The gap between the roles of academic researchers and students, and the gap between frontier disciplinary or cross-disciplinary research and knowledge possessed by undergraduate students can be further diminished in Extra-curricular Integration activities. Students with wider research interests and greater academic capabilities can be recognised and further trained through Extra-curricular Integration activities. Therefore, departments and universities should value undergraduate research participation, and create more opportunities with supporting resources for undergraduate Extra-curricular Integration. With widening and deepening undergraduate research participation, departments and universities are also developing their own talent pools.

Departments and universities are also encouraged to introduce more employment-based opportunities for students who choose to be less academic. Employment-based activities are not opposed to research-based activities but have slightly different focuses. As explained by Clark and Hordosy (2019), many abilities and skills that are developed via research-teaching integration are also important for employability and career development, such as critical thinking. Meanwhile, the scholars reinforced that the research-teaching nexus '*can exclude as much as it includes*' (p.425) depending on various factors. Therefore, more options or autonomy allowed for the students are

likely to enhance the overall student nexus experience at the university, especially their motivation to learn and partake in research. For example, some focus group participants expressed frustration from some of their research-teaching integration experiences because of forced choices. Notably, many universities in the UK have placement year options for students, whereas placement year opportunities are not common in China. Until recent years, some Chinese universities start to encourage students to have teaching placement in rural areas, and some participants in the teaching placement can get school recommendations for postgraduate study (e.g. PKU, 2019). The study suggests more placement opportunities can be considered at universities in both countries, and the nature of the placement (e.g. research- or employment-related) can be diversified.

At research-intensive universities, research output and impact are usually considered as decisive factors in the academic evaluation and promotion schemes. It is suggested that teaching performance and contribution need to (re)gain higher status in the academic reward systems to encourage higher teaching quality. Particularly, research-integrated teaching (especially with lecturers' own research) can be considered part of research impact, as in this way teaching is also dissemination of research. The evaluation metrics should be carefully designed and reviewed, and it requires policymakers at higher education institutions to fully understand the complexity of the research-teaching nexus.

Beyond the classroom and university practice and policy, as indicated by Malcolm (2014) and Clark and Hordosy (2019), the research-teaching nexus is influenced by the wider contexts. For policymakers at the regional and national levels, it is important to involve more debate with 'insiders' before policy-making and announcement. While there is increasing external supervision on teaching quality (e.g. TEF in the UK and MOE policies in China), the reliability of the measurement and effectiveness of the policies in practice are sometimes questionable. For example, Neary (2016) introduced that the metrics in TEF are extensively criticised as they cannot effectively measure the quality of teaching and learning. In China, building an effective research-teaching nexus is not simply requiring the academics who conduct research to undertake more teaching responsibilities, too. National and regional policymakers should engage with more frontline academics and up-to-date literature, and stimulate discussion and dissemination of related research findings. It is also highlighted that policies should always be contextualised.

In terms of funding, similar to the recommendation for academic reward systems, research-integrated teaching can be incorporated into research impact to enhance the research-teaching nexus. As Hattie and Marsh (2004) clarified, the little or zero relationship between research and teaching from their meta-analytic review (Hattie and Marsh, 1996) does never indicate funding for

research and teaching should be separated. The scholars reinforced that *'the fundamental issue is what we wish the relation to be'* (Hattie and Marsh, 2004, p1., with original emphasis).

In the focus group interviews, some participants raised the issue that many companies highly value rankings of the applicants' universities, and thus applicants from research-intensive universities are privileged. Such recruitment preference has urged students to study at research-intensive universities regardless of their interest. For students with less interest in research, their nexus experiences or even overall study experiences at research-intensive universities might be compelled and unsatisfied. Policymakers at regional and national levels are suggested to encourage employers to reasonably recruit graduates from different types of universities with favourable policy support. If the employment market is guided to be more inclusive for applicants from less research-oriented universities, more students are able to choose the most suitable type of universities and thus experience the best-fit research-teaching nexuses.

Furthermore, all policymakers need to carefully monitor and review the actual policy implementation process. Adjustments should be made in time if needed. After all, policies are realised in ongoing cycles of being made and re-made, because their actual outcomes are largely influenced by the dynamics of the different stakeholders (Jones, 2013).

6.5.3 Implications for future research

Along the journey of exploring business school undergraduate student experiences of, and engagement with, the research-teaching nexus at research-intensive universities in China and the UK, several directions for future research have become apparent.

In terms of the application of Healey's (2005) research-teaching nexus framework in the Chinese context, while Phase 1 thematic analysis successfully identifies each nexus type within Healey's (2005) theoretical framework, Phase 2 statistical analysis cannot differentiate these nexus types. Also, relationships between specific nexus types and different ways of nexus engagement are not clarified. Further studies can be carried out to examine the reasons for the inconsistent results from the two research phases, to what extent Healey's (2005) nexus types are recognisable, and the impact of specific nexus types (or hybrids) on specific ways of nexus engagement in China. In the UK, the impact of the Academic Interest Led Integration type on nexus engagement can be further explored. In future studies, the questionnaire Item 2.1 can be examined and revised to more effectively interpret the meaning of Healey's (2005) Research-led Teaching.

Extra-curricular Integration, as an independent nexus type proposed by this study, has distinctive characteristics compared to within-curriculum nexus types. Therefore, studies with a specific focus on Extra-curricular Integration are recommended. Investigation can be approached from different aspects, including but not limited to what opportunities and supporting resources can be provided for Extra-curricular Integration within departments or at the university, how to encourage academics and students to engage with Extra-curricular Integration, and what is the impact of Extra-curricular Integration etc.

As student experiences of and attitudes towards the research-teaching nexus are rarely studied in China, more empirical studies in the Chinese context are advocated. By adding empirical evidence, more similar or contrasting findings will be revealed. It contributes to further understanding of the student nexus experiences and engagement in China. In addition to descriptions of the overall student nexus experiences and engagement, some particular aspects pointed out by the current study can be further inspected. For example, the impact of experienced nexus types on the ways of nexus engagement is generally stronger in China than in the UK, except for the impact on Beliefs of Importance of Research-teaching Integration. The detailed reasons are not fully clarified yet. Further exploration of the impact of rote learning in secondary school on the transition to research-integrated teaching and learning is also recommended.

For addressing the argument over to what extent in-depth research-teaching integration is necessary for undergraduate students, and to what extent students should be allowed to choose the desired levels of research-teaching integration, further discussion is encouraged. Based on the need of promoting a positive research-teaching nexus, more theoretical elucidation and empirical evidence are also requested to propose and validate feasible and effective criteria for refining academic evaluation and promotion systems. Additionally, there can be further inspections and comparisons of the various aspects to help understand more details of the research-teaching nexus in business school undergraduate experiences and engagement at research-intensive universities in China and the UK. For example, domestic comparisons between the two selected universities within each country are possible. Regarding the diversified student demographic backgrounds, potential differences in their nexus experiences and engagement can be explored across different academic years, options of dissertation completion, and intentions to pursue postgraduate study etc. With the revealed student nexus experiences and engagement, a comparison between the academics' opinions and pedagogical designs of the research-teaching nexus can also provide insights into the topic.

6.5.4 Key recommendations for a quick win

Upon the detailed implications for the various stakeholder groups as described in previous sections, three key recommendations are highlighted for improving undergraduate research-teaching nexus experiences and engagement effectively and efficiently.

More scaffolding: Enhancing communication between lecturers with students

First, lecturers are recommended to scaffold student learning in the whole research-teaching integration process with more explicit communication and more active interactions.

As implied by the findings of both Phase 1 focus group interviews and Phase 2 survey, lecturers play a crucial role in shaping the student nexus experiences and engagement. Especially for the within-curriculum integration, students experience different nexus types primarily based on lecturers' particular pedagogical designs and course delivery. Their ways of nexus engagement are also heavily influenced by lecturers' in-module or extra-curricular research-teaching integration preferences and performance. For example, Quality of Teaching Delivery is one of the ways how students engage with the research-teaching nexus, and its connections with lecturers are straightforward. Therefore, improvement in lecturer behaviours will make a difference in undergraduate nexus experiences and engagement with a direct and even immediate effect.

Positive student experiences of and engagement with research-integrated teaching need sufficient academic scaffolding and usually require more effort and time input from the lecturers (and also students) than traditional teaching, as suggested by the findings of this study and some other studies (e.g. Abdel Latif, 2019; Clark and Hordosy, 2019). Explicit communication and active interactions with the students can effectively enhance the perceived scaffolding quality and are relatively easy to implement.

To be specific, lecturers are recommended to clearly communicate with students about what research elements are integrated into teaching, why the particular research content is selected, where to start with research-integrated learning and how to gradually proceed, and what the potential benefits are etc. While these issues should be carefully evaluated by lecturers in the process of designing appropriate research-teaching integrations, it is also important to convey the ideas to the students. It helps lecturers to fully achieve the intentions of pedagogical designs, and assists students in understanding, accepting, and possibly enjoying research-integrated teaching.

Active interactions also correspond with the importance of lecturers' feedback and support, as discussed in Phase 1 focus group interviews and also indicated in the Phase 2 survey. Taking the

participant's (UKFG2-5, see Section 4.3.4) 'boomerang' metaphor again, interactions and iterations in the teaching and learning process are particularly important for research-integrated teaching. Compared to traditional teaching, research-integrated teaching incorporates more creative and inquiry-based content, which means more 'blank space'. Undergraduate students, especially those who are relatively less familiar with research, can easily get lost in the research-integrated learning process. Lecturers are recommended to actively interact with students, locate students' actual progress and pinpoint the difficulties they are facing as well as the achievement they have made in the journey. In-time feedback and tailored support from lecturers can help students make the most of research-integrated teaching and motivate further interest in research and the discipline.

More autonomy: Increasing curriculum flexibility

Second, as a response to the perennially mentioned 'options' by Phase 1 focus group interview participants in both countries, managers and policymakers at the school and university levels are recommended to increase flexibility in the curriculum. This will help improve student autonomy in deciding their research-teaching nexus experiences and engagement.

Participants in this study strongly advocated that they would like more options in the depth and range of research-teaching integration. They suggested that if they could possibly choose the most suitable nexus types or hybrids that fitted their academic capabilities, learning styles and interest, their overall nexus experiences and learning outcomes would be maximised. With perceived positive nexus experiences, student engagement with the nexuses would also be stimulated. It is not realistic to provide customised research-teaching integration for every single student, and more options do not necessarily guarantee a most satisfying nexus experience, whereas a more flexible curriculum still helps accommodate different student abilities and demands. Two particular measures are suggested as follows.

Regarding curricula for programmes, the proportion and availability of optional modules can be increased, especially for undergraduate students in their senior years. As indicated by Phase 1 focus group participants across countries, some of them found that the programme curriculum was too rigid and the majority of modules were compulsory. Both the learning content and types of research-teaching integration were limited. Compulsory modules equip undergraduates with fundamental disciplinary knowledge and should remain as core components in the curriculum. Nevertheless, schools and universities need to review which modules are considered 'compulsory' from time to time, and provide a balanced curriculum structure with an appropriate ratio of compulsory to optional modules. This helps gain the width of disciplinary or interdisciplinary knowledge in the curriculum, allows more varieties in research-teaching nexus types and hybrids, and thus improves

student nexus experiences and encourages students' interest in research and the discipline. Specifically, in the UK context, participants from both UK1 and UK2 talked about the considerable gaps in their research-teaching integration and general learning experiences across academic years. With increased flexibility in the programme curriculum, students are more likely to adjust their pace of learning as needed.

As for curricula for individual modules, lecturers can be granted more autonomy in deciding course content, forms of teaching activities, and ways of assessment. A focus group interview participant at CN1 mentioned that a lecturer told them that for the particular module, the way of assessment was required to be fixed (by either the school or the university). Even the number of assignments/exams and the proportions of marks from each assessment task were fixed. The participant's experience echoed Hu et al.'s (2019) findings that lecturers at a Chinese university found it difficult to integrate research into teaching because of the fixed curriculum requirement. Although such situations might be less common, it is still important to reinforce that only when lecturers have more autonomy in teaching can students (either as audience or active participants) be able to experience various research-teaching integration.

More Extra-curricular Integration: Widening Extra-curricular Integration opportunities

Third, more Extra-curricular Integration opportunities are recommended to be available for undergraduates, especially for undergraduates at research-intensive universities in the UK. The opportunities can be provided by academics, schools and universities.

Extra-curricular Integration is consistently identified from Phase 1 and Phase 2 results across countries, and is proposed as an independent research-teaching nexus type experienced by students. Its unique advantages in stimulating undergraduate nexus experiences and engagement are clarified in Section 6.2.1.1. As suggested by Phase 1 findings, participants from both countries had noticed or participated in Extra-curricular Integration activities, whereas participants in China had more activities and more in-depth experiences of Extra-curricular Integration in general. A few UK participants explicitly pointed out that they lacked Extra-curricular Integration opportunities at the universities and lecturers appeared to be less helpful in Extra-curricular Integration. Meanwhile, statistical analysis results of the Phase 2 survey indicated that in the UK context, Extra-curricular Integration was important for student Participation in Research and perceived Quality of Teaching Delivery, and was the only nexus type that showed statistical significance in the relationship with Quality of Teaching Delivery. In China, Extra-curricular Integration was positively associated with all of the five ways of nexus engagement, and was more important than Within Programme Integration for student Awareness of Research. Given the importance of Extra-curricular Integration, lecturers,

schools and universities are advised to help widen and deepen undergraduate Extra-curricular Integration experiences.

Lecturers (especially lecturers in the UK) are suggested to have a more welcoming attitude towards undergraduate Extra-curricular Integration. In addition to providing direct Extra-curricular Integration opportunities by introducing their own research projects or even inviting students to participate, lecturers can be supportive in various ways. For example, lecturers can share research resources and information such as academic journals and databases, disciplinary research associations and learning societies, and other potential research projects or conference opportunities etc.

At both the school/departmental and the university levels, more Extra-curricular Integration activities in different forms can be organised and advertised. Some of these activities are recommended to be designed for undergraduate students. Most research seminars, workshops and conferences held at the universities are open to all students and staff. As presenters are usually experienced researchers, on one hand, undergraduate students get to assimilate frontier research information. On the other hand, however, they tend to be quiet audience with less engagement because they cannot effectively understand or interact with the presenters. Extra-curricular Integration with a specific focus on undergraduates, such as undergraduate conferences, competitions of undergraduate research projects, and peer fieldwork or research seminars, can help develop richer and more in-depth Extra-curricular Integration experiences. While Extra-curricular Integration activities within schools or faculties promote disciplinary research and interest, university-wide opportunities are recommended to encourage interdisciplinary coordination and enable further varieties in student experiences of research-teaching integration.

As these recommendations are made based on the investigation into undergraduate student nexus experiences and engagement in business schools at research-intensive universities in China and the UK, application in different contexts will always need caution. Particularly, supporting undergraduate Extra-curricular Integration tends to demand more research resources at the universities, and thus it might be more difficult to implement at less research-intensive universities.

6.6 Concluding remarks

In today's HE, especially at research-intensive universities, the concept of the research-teaching nexus is '*ubiquitous*' (Clark and Hordosy, 2019, p. 424). Understanding the commonalities in, and varieties of the undergraduate research-teaching nexus experiences and engagement is vital for

contextualised HE practice and policy making. This study provides rich contemporary empirical evidence of undergraduate student research-teaching nexus experiences and engagement in business schools at research-intensive universities in China and the UK. The findings clarify and extend the knowledge about the nexus types experienced by the business school undergraduates, the ways of nexus engagement, and what nexus types are important for what ways of nexus engagement in both countries. The findings can also be referred to in other countries for analysing their own research-teaching nexus student experience and engagement and making comparisons. The study contributes to narrowing the research gaps in the literature, and provides evidence-based implications for different stakeholders including academics, university managers, and policymakers in the wider society.

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Appendix A Sample Participants Recruitment Poster



Research Participants Needed

Hi I'm Jingwen, a PhD student from Southampton Education School. I'm looking for volunteers to take part in focus group interviews about the integration of research into teaching (ERGO: 46120).

If you are:

- An **undergraduate** student in the University of Southampton
- Have studied any **Economics, Finance, or Accounting related module**

And you are happy with:

- Discussion Topic: Your experiences and attitudes towards the integration of research into teaching in Economics, Finance, and Accounting related modules
- Format: 45-60min focus group interviews (5-7 participants per group)
- Time: **Between 25th February and 10th March 2019** (To be confirmed at participants' availability)
- Reimbursement: £5 Amazon voucher and light refreshment at the discussion

If you swipe me right, please feel free to contact me at jw9g15@soton.ac.uk and suggest several time slots which are suitable for you. Ideally, please also indicate your major and current year of study for data categorising purposes.

Thank you so much!

Appendix B Discussion Outline

Discussion Outline

Introduction

Thank you so much for joining in today's discussion! In the following 60 minutes or so, we are going to talk about your experiences, feelings and attitudes towards the integration of research into teaching in your business school modules. Every participant's opinions are extremely valued.

Also, I would be greatly appreciated if you considerately keep all the participants' identities and the discussion contents confidential. Thank you!

Here is the outline for our discussion.

1. In your opinion, what does 'Research' mean in the context of business schools?
2. Did you notice your lecturers from business school modules integrating any component of research into teaching?
3. a) If so, how did they integrate research into teaching?
b) How do you like the integration?
4. If you didn't notice any integration of research and teaching, could you think of some possible reasons?
5. Do you think research should be integrated into teaching in business school modules, and does it matter to you? Why?
6. What factors do you think that may influence your feelings and attitudes about the integration of research into teaching?

Thank you so much 😊

Appendix C Questionnaire

Business School UG student experience of integration between research and teaching survey

I agree to participate in this survey and understand it is voluntary and confidential.

Part 1

Which university are you studying at (as an undergraduate)?

- University of ANONYMISED1
- University of ANONYMISED2
- Other universities (please specify): _____

Which academic year are you currently in?

- Year 1 Year 2 Year 3 Year 4 Year 5 & above Graduated in 2019

What is your gender?

What is your programme/major?

Does your programme require to undertake a dissertation/thesis?

- Yes, it is compulsory.
- It is optional, and I took/plan to take it.
- It is optional, and I didn't take/don't want to take it.
- No dissertation at all.
- I don't know.

Do you intend to pursue a postgraduate degree upon graduation?

- Yes, I am going to/plan to study a postgraduate degree.
- No, I am going to/plan to find a job.
- I'm not sure yet.

Are the Economics, Finance, Accounting and Management (EFAM) related modules being taught in your first language?

- Yes, all of the EFAM modules are taught in my first language.
- Sometimes, part of the EFAM modules are taught in my first language.
- No, none of the EFAM modules are taught in my first language.

Part 2

Within your Economics, Finance, Accounting and Management related modules,		Never	Rarely	Some-times	Often	Always
1	Teaching focused on information transmission of subject contents.	1	2	3	4	5
2	Research findings in my subject areas were introduced.	1	2	3	4	5
3	My teachers decided module contents based on their own research interests.	1	2	3	4	5
4	Teaching was largely based on inquiry-based activities. (E.g. Seeking for creative solutions to the posed questions/problems, undertaking an independent project as a part or whole of a module, or being involved in practical activities/fieldwork based on research projects etc.)	1	2	3	4	5
5	We were active participants rather than audience in classes.	1	2	3	4	5
6	The division between teachers and students was minimised.	1	2	3	4	5
7	There were tutor-led group tutorials/seminars featuring small group discussion on published research findings.	1	2	3	4	5
8	There were peer-led group discussion on research findings.	1	2	3	4	5
9	There were one-to-one tutorials with tutors featuring discussion on research findings.	1	2	3	4	5
10	Understanding the research process was emphasised.	1	2	3	4	5
11	Research methods and skills were introduced. (E.g. Qualitative and quantitative methods, interviewing or survey skills, statistical analyses etc.)	1	2	3	4	5
12	A research culture was promoted in teaching.	1	2	3	4	5
From your university experiences <u>outside</u> modules,		Never	Rarely	Some-times	Often	Always
13	My teachers invite us to participate in their research projects (as research assistants or participants) outside modules.	1	2	3	4	5
14	I have opportunities to undertake or participate in research projects in the university (not in modules).	1	2	3	4	5
15	There are research seminars, workshops and academic conferences related to my subjects held in my department and university.	1	2	3	4	5

Part 3

From your overall university study experiences (both in-module and outside modules),		Never	Rarely	Some-times	Often	Always
16	I gained understanding of the meaning of 'research'.	1	2	3	4	5
17	I learned knowledge about research findings.	1	2	3	4	5
18	I learned to pay attention to the way research is carried out.	1	2	3	4	5
19	The rigorous research process was an essential part of the curriculum.	1	2	3	4	5
20	Attention was paid to research methodology.	1	2	3	4	5
21	I became familiar with the research carried out by my teachers.	1	2	3	4	5
22	I came in contact with my teachers' research.	1	2	3	4	5
23	My awareness of the research issues that academic researchers are currently contributing to was increased.	1	2	3	4	5
24	I learned what kind of studies have been carried out in my field.	1	2	3	4	5
25	Links to current research practices were made.	1	2	3	4	5
26	My contribution to the research was valued.	1	2	3	4	5
27	My participation in the research was important.	1	2	3	4	5
28	I made a contribution to development in my field.	1	2	3	4	5
29	As a student I felt involved with the research.	1	2	3	4	5
30	I became involved in my teachers' research.	1	2	3	4	5
31	My teachers carried out instruction and feedback adequately.	1	2	3	4	5
32	My teachers were able to explain the subject matter effectively.	1	2	3	4	5
33	I developed an accurate picture of what was expected of me.	1	2	3	4	5
34	The contents being taught were practical.	1	2	3	4	5
35	The overall level of difficulty and amount of workload required were appropriate.	1	2	3	4	5

Questionnaire

From your overall university study experiences (both in-module and outside modules),		Never	Rarely	Some-times	Often	Always
36	I was inspired to learn more about this discipline.	1	2	3	4	5
37	I became enthusiastic about my scientific domain.	1	2	3	4	5
38	My interest in research in this area was increased.	1	2	3	4	5
39	My teachers encouraged personal interest and enthusiasm for research in this field.	1	2	3	4	5
40	I was inspired to spend extra time and effort on learning my subjects beyond the requirement of exams.	1	2	3	4	5

From your overall university study experiences (both in-module and outside modules),		Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
41	My learning is stimulated when education is grounded in research.	1	2	3	4	5
42	Education in which rigorous research is central stimulates my learning.	1	2	3	4	5
43	The research culture at the institute stimulates my learning process.	1	2	3	4	5
44	Good researchers make good teachers.	1	2	3	4	5
45	Research-integrated teaching is necessary for my learning.	1	2	3	4	5

Last but not least...

Would you like to participate in a short follow-up interview, and take part in our prize draw to win up to £20 Amazon vouchers?

Yes, please contact me at _____

No, thanks.

Thank you so much♥

Appendix D Demographic summaries of the Phase 2 survey respondents

Respondents by gender

	China	UK
Male	116 (28.4%)	80 (49.4%)
Female	290 (71.1%)	80 (49.4%)
Others	2 (0.5%)	2 (1.2%)

Respondents by year of study

	China	UK
Year 1	49 (12.0%)	44 (27.2%)
Year 2	135 (33.1%)	24 (14.8%)
Year 3	148 (36.3%)	82 (50.6%)
Year 4	74 (18.1%)	8 (4.9%)
Year 5 & above	2 (0.5%)	0 (0.0%)
Graduated in 2019	0 (0.0%)	4 (2.5%)

Respondents by dissertation requirement

	China	UK
Compulsory	398 (97.5%)	95 (58.6%)
Optional yes	0 (0.0%)	23 (14.2%)
Optional no	0 (0.0%)	15 (9.3%)
No dissertation	2 (0.5%)	16 (9.9%)
I don't know	8 (2.0%)	13 (8.0%)

Demographic summaries of the Phase 2 survey respondents

Respondents by intention to pursuing postgraduate study

	China	UK
With intention	351 (86.0%)	48 (29.6%)
Without intention	34 (8.3%)	79 (48.7%)
Not sure yet	23 (5.6%)	35 (21.6%)

Respondents by courses taught in which languages

	China	UK
All in first language	211 (51.7%)	116 (71.6%)
Partly in first language	177 (43.4%)	6 (3.7%)
None in first language	20 (4.9%)	40 (24.7%)

Appendix E Comparisons in Cronbach's alpha scores before and after deleting items

E-1 Comparisons in Cronbach's alpha scores before and after deleting items (EFA regarding China sample)

Changes in Cronbach's alpha scores: Reliability tests regarding China nexus types

Scales	Number of items	Cronbach's alpha	
		With Item 2.1	Without Item 2.1
Research-led teaching	3	.45	.66
Healey's (2005) four nexus types	12	.89	.90
All nexus types	15	.89	.90

Changes in Cronbach's alpha scores: Reliability tests regarding China student engagement

Scales	Number of items	Cronbach's alpha	
		With Item 3.44	Without Item 3.44
Beliefs	5	.86	.87
All ways of engagement	30	.95	.95

E-2 Comparisons in Cronbach's alpha scores before and after deleting items
(EFA regarding the UK sample)

Changes in Cronbach's alpha scores: Reliability tests regarding the UK nexus types

Scales	Number of items	Cronbach's alpha	
		With Item 2.1	Without Item 2.1
Research-led teaching	3	.39	.42
Healey's (2005) four nexus types	12	.81	.82
All nexus types	15	.82	.83

Changes in Cronbach's alpha scores: Reliability tests regarding the UK student engagement

Scales	Number of items	Cronbach's alpha	
		With Item 3.35	Without Item 3.35
Beliefs	5	.75	.76
All ways of engagement	30	.94	.94

Appendix F China EFA results regarding Healey's (2005) items only (Item 2.2-2.12)

The KMO measure of sampling adequacy was .93, and Bartlett's test of sphericity was significant ($\chi^2(55) = 1957.61, p < .001$).

Factor extraction and rotation methods: Maximum Likelihood and Direct Oblimin

Factor loadings of the one-factor solution (factor extracted based on eigenvalues exceeding 1)

Items	Item loadings upon the one factor
Item 2.2	.59
Item 2.3	.55
Item 2.4	.65
Item 2.5	.64
Item 2.6	.63
Item 2.7	.72
Item 2.8	.65
Item 2.9	.72
Item 2.1	.77
Item 2.11	.71
Item 2.12	.72

Factor loadings of the forced four-factor extraction

Items	Item loadings upon the four factors			
	F1	F2	F3	F4
Item 2.2			.78	
Item 2.3			.60	
Item 2.4			.42	
Item 2.5				.67
Item 2.6	.39			.35
Item 2.7	.55			
Item 2.8	.58			
Item 2.9	.69			
Item 2.1		-.78		
Item 2.11		-.74		
Item 2.12		-.68		

Appendix G The UK EFA results regarding Healey's (2005) items only (Item 2.2-2.12)

The KMO measure of sampling adequacy was .82, and Bartlett's test of sphericity was significant ($\chi^2(55) = 459.13, p < .001$).

Factor extraction and rotation methods: Maximum Likelihood and Direct Oblimin

Factor loadings of the three-factor solution (factor extracted based on eigenvalues exceeding 1)

Items	Item loadings upon the three factors		
	F1	F2	F3
Item 2.2	.46		
Item 2.3		-.95	
Item 2.4			.40
Item 2.5			.60
Item 2.6			.72
Item 2.7			.39
Item 2.8			.48
Item 2.9			.43
Item 2.1	.81		
Item 2.11	.72		
Item 2.12	.61		

The UK EFA results regarding Healey's (2005) items only (Item 2.2-2.12)

Factor loadings of the forced four-factor extraction:

Items	Item loadings upon the four factors			
	F1	F2	F3	F4
Item 2.2		.34		.35
Item 2.3				.50
Item 2.4				
Item 2.5			.61	
Item 2.6			.69	-.32
Item 2.7			.43	
Item 2.8	.32	.35		
Item 2.9	1.02			
Item 2.1		.61		
Item 2.11		.91		
Item 2.12		.53		