Using visual metaphors to enhance the learning experience of international postgraduate management students at a university in England: a pedagogical action research study

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Abstract

Lectures are a ubiquitous feature of higher education pedagogy. The cognitive demands associated with lectures can be immense for international students who are not operating in their first language. The high volume of unfamiliar and abstract concepts that lectures typically contain can make learning difficult. International students are extremely valuable to UK universities and the UK economy; their pedagogical needs deserve better attention. Existing literature asserts that metaphors are a powerful way to communicate complex or abstract concepts in a clear and compressed way. However, the potential contribution that visual metaphors can make to learning has not been fully investigated. This thesis explores how visual metaphors can be used in lectures delivered to international postgraduate management students to communicate meaning and enhance the learning experience. The researcher, a lecturer in a Russell Group university, worked with his international postgraduate students using a pedagogical action research methodology to better understand why certain visual metaphors enhance students' learning while others do not, an understanding absent from the existing literature. Over the four cycles of the research, a range of data collection methods were used, the most useful of which were metaphor elicitation and process interviews. The development of process interviews, an innovative data collection method, helped to overcome the metacognitive obstacles encountered when participants discuss their own learning. The large quantity of data generated through process interviews was analysed using thematic analysis. This study's principal contribution to knowledge is a model that summarises the eight most important facets of powerful visual metaphors. When visual metaphors are selected for incorporation into lectures with the assistance of the model, they are more likely to have a positive impact on the learning experience. The model has resonated with and been validated by practitioners from a range of contexts and can be used to enhance the quality and accessibility of teaching in situations where learners encounter abstract concepts for the first time or are processing meaning in a second language.

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Abbreviations

AI	Artificial intelligence
AR	Action research
ARNA	Action Research Network of the Americas
BERA	British Educational Research Association
CARN	Collaborative Action Research Network
CERJ	Cambridge Educational Research Journal
CMT	Conceptual metaphor theory
EdD	Doctorate in Education
EU	European Union
HE	Higher education
HEA	Higher Education Academy[1]
HEPI	Higher Education Policy Institute
HESA	Higher Education Statistics Agency
IELTS	International English Language Testing System
ISB	International Student Barometer
ITM	Introduction to Management
PAR	Participatory action research
QS	Quacquarelli Symonds

[1] Known as Advance HE since 2018.

STEM	Science, Technology, Engineering and Mathematics
TA	Thematic analysis
TES	Times Educational Supplement
THE	Times Higher Education
UNE	University of the North of England
US	United States
UUKI	Universities UK International

Images Used in this Thesis

Most of the photographic images used in this thesis are from Shutterstock, with whom I have a subscription account. Shutterstock have confirmed that under the terms of my subscription, no attributions are needed if images are used for non-commercial purposes. Images taken from other sources include attributes.

One of my research methods has involved participants providing images for discussion in seminars. When examples of such images have been used to form the basis of a discussion, I have made it clear that they have been found by participants, not by me. However, to avoid copyright infringement, I have substituted images found by participants with similar images from Shutterstock or another suitable source. In situations where the image's meaning would be lost because a suitable substitute was unavailable, I have not included an image as part of the discussion.

The cartoon images have been created by Marcus Byron (of Marcus Byron Designs). These images are his interpretations of drawings I provided him with. Where the images are based on or adapted from other sources, this has been indicated.

Quotations

This thesis contains quotations from academic sources and research participants. When providing a direct quote from a text, or a verbatim quotation from a participant, these have been placed in double speech marks following APA7 guidelines (Appearance Publishers, 2022). Where I have provided a generalised quotation, such as terminology used more broadly by a particular author, or words used by multiple participants, these have been placed in single speech marks. Where a quotation or material is drawn from a group of participants, the group is named using a code (see Appendix 1). This strengthens the anonymity of participants but also reflects that, when transcribing focus groups and interviews, it was often impossible to distinguish between individual participants and attribute contributions to them.

Transcription “as a practice is inherently embedded in relations of power” (Bucholtz, 2000, p. 1439). I have been mindful of this issue when transcribing focus group and interview recordings. In some cases, the verbatim quotations of participants' spoken words represent far from perfect English. I have tried to capture the voices of my participants as they spoke, reflecting Seale’s (2009) view that this is important for authenticity, but I have chosen only to use quotations that I believe have meaning and contribute to supporting or illustrating my arguments.

Thesis Word Count

At 68 000 words, this thesis exceeds the normal word count for an EdD submission. This has been necessary to maintain the academic integrity of the study and to ensure that the research story is authentic and told in full. As I have moved through the four cycles of the action research (AR), unanticipated problems have been encountered and addressed by adapting and developing the data collection methods. Additional unpredicted issues were related to conducting research during the COVID-19 pandemic. Discussing how I navigated these issues has inevitably added to the word count.

Citations and References

The citations and references in this thesis have been produced using the APA7 format (Appearance Publishers, 2022). Anonymity has been afforded to the university in which this study was based, which is referred to as the University of the North of England (UNE) throughout the text. To maintain this anonymity, documents and web pages that pertain directly to the UNE are noted in the text when referred to but are not included in the reference list. This approach has been followed on the advice of Huddersfield University library, who suggest that an anonymised reference is not in keeping with spirit of APA and is effectively meaningless to anyone who wishes to follow it up.

The explanations of the use of process interviews (primarily in Section 5.2.3) include content based on a paper published in the Cambridge Educational Research Journal (Cotterill, 2022b).[2]

[2] Cambridge Educational Research e-Journal (CERJ) is published by the Faculty of Education at the University of Cambridge. The publication is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported Licence.

Chapter 1: Introduction

1.1 Introduction

This chapter explains the context in which my research has been conducted and the origins, and rationale, for it. The contextual background justifies the focus of my research. This background includes a discussion of the ways in which the UK higher education (HE) system has become more internationalised in recent years, and the experiences of international students within it.

1.2 My Teaching Context

In 2016, I began working as a lecturer of business and management in the international pathway college of a Russell Group university that will henceforth be referred to as the University of the North of England (UNE). This new department was established to provide study programmes for international (non-EU) students to progress to undergraduate and postgraduate courses at the university. The vast majority of the department's students are from China and want to undertake postgraduate (master's) studies at the University's School of Management. Students receive tuition in English language, academic skills, and a foundation in relevant content material over two or three terms, depending on their IELTS score. I am the module leader for Introduction to Management (ITM), a Level 5 pre-master's course (QAA, 2022) that provides international graduate students with an introduction to the academic field of management. In this role, I deliver the course lectures, prepare resources for seminar delivery, and design and administer module assessments. My work as module leader for this course provided the genesis for my research interest. I could see that international students found learning challenging, and I wanted to enhance my own practice to make learning more accessible to them. The focus on enhancement meant that an AR approach was the most suitable methodology to employ (Bendtsen et al., 2021).

1.3 The Internationalisation of UK Higher Education

According to the Higher Education Statistical Agency (HESA, 2022), in 2020/21 there were over 600 000 international students studying at UK universities, of whom approximately 450 000 were from outside the European Union (EU). Of full-time postgraduate students, almost half were drawn from outside the EU. Almost 152 000 Chinese students were studying in the UK in 2022 (HESA, 2022), the largest cohort of international students. Globally, after the US and Australia, the UK is the third most popular destination for international students (UUKI, 2022). According to HESA (2022), business and management courses are the most popular choice for international students. The Universities and Colleges Admissions Service (UCAS) expects international student numbers to increase in the UK by 50% over the next five years (Woolcock, 2022).

With international, and especially non-EU students paying significantly higher course fees, they are an important revenue stream for UK universities (Busby, 2020; Bloom, 2020). The UNE charges non-EU students almost two and a half times as much as UK students for master's courses (data drawn from the UNE website). It is estimated that by the 2024/25 academic year, over 22% of UK HE income will be drawn from fees paid by international students (Office for Students, 2022). Unsurprisingly, along with the US, Canada and Australia, UK HE institutions are actively pursuing strategies designed to recruit large numbers of international students, sometimes with support from the government (Kearney & Lincoln, 2017; Wen et al., 2019) and often seem to prioritise the recruitment of international students over domestic (Parker, 2022). The principal of Edinburgh University has warned that research-intensive UK universities, such as the UNE, are highly dependent on Chinese students to cross-subsidise research projects (Linklater, 2022), putting them in a precarious position should the attractiveness of UK HE decline.

The Higher Education Policy Institute (HEPI) and Universities UK International (HEPI, 2021) have estimated that the gross economic impact on the UK economy of international students is over £28.8 billion per annum, while the Department for

Education estimated that in 2019 international students contributed approximately £20bn a year to the UK economy (Department for Education, 2019). A previous report by HEPI (2018) stated that international students generated an economic benefit to the UK that was ten times any associated costs they were responsible for.

Therefore, international students are extremely valuable to UK universities and the UK economy. As such, I believe that UK HE institutions are responsible for ensuring that their pedagogy is accommodating and sympathetic to the challenges international students face.

1.4 Experiences of International Students

1.4.1 Difficulties Faced by International Students

International students in UK HE are expected to navigate, in many cases, a very different education system and culture from their own while typically attempting to access teaching and learning in a language that is not their first (Henze & Zhu, 2012; Tung, 2016; Wang, 2018). These potential obstacles, which may be cultural, linguistic, or structural (Ecochard & Fotheringham, 2017), are particularly significant for Chinese students in western universities (Tung, 2016). Given that almost all of my students are from China, focusing on this particular group and the issues and problems specific to them is worthwhile.

Perhaps unsurprisingly, international students achieve, on average, lower grades than domestic students (McGregor et al., 2022). Some UK universities have tried adapting support systems and teaching practices to better serve the international cohort (Ramachandran, 2011). However, research has indicated that western educators are often ill-equipped to teach, and insensitive to, the cultural and linguistic needs of international students, and Chinese students in particular (Valdez, 2015). Teachers may, for example, use contextual material and pedagogic principles that are culturally inaccessible to them (Heng, 2017). As Ryan (2012) explains, “the presence of

international students on university campuses does not automatically bring about internationalisation of curriculum and pedagogy" (p. 1).

Difficulties for Chinese students may extend beyond those that are academic. In their study of Twitter data during the COVID-19 pandemic, Mittelmeier and Cockayne (2022) reported alarming levels of racist language with reference to Chinese students, while Héliot et al. (2020) found discrimination and bias to be a common feature of the learning environment at a UK business school.

Balancing the needs of domestic and international students is a challenge. At the UNE, there is a tension between maintaining the Britishness of the institution, ensuring standards remain high and providing a teaching and learning environment that effectively accommodates international students and enables them to thrive. As McGregor et al. (2022) contend, "A crucial component of successful internationalization is an equitable, positive, and progressive learning experience for both international and domestic students" (p. 22).

In terms of cultural adaptation, several studies have indicated that of all international students, Chinese students are most likely to feel a high level of *culture shock* when accessing the western higher education system (Spencer-Oatley & Xiong, 2006; Zhang & Goodson, 2011; Caprar, 2017). Culture shock involves undergoing an unexpected, surprising experience that generates negative emotions as an individual encounters a new culture (Furnham, 2019). Placing learners in stressful situations is acknowledged to impede learning (Vogel & Schwabe, 2016).

Chinese students studying in western universities alongside other Chinese students face an almost constant tension between improving their English and freely conversing in their mother tongue (Bai, 2016; Yan & Berliner, 2011). Adapting to learning in English has been identified as a significant source of anxiety for Chinese learners and has contributed to their problems with accessing teaching content (Wang & Shi, 2018). Mandarin Chinese, a tonal language, and English are phonologically different; the perceptual narrowing that Chinese students will have experienced as they mastered

their first language makes learning English cognitively challenging (Costa, 2020). Furthermore, based on brain imaging research, it is apparent that operating in a second language to process information is cognitively costlier; learning in a second language can be stressful and exhausting (Costa, 2020). To compound these problems, some Chinese students are left feeling isolated, depressed (Clarke, 2018; Tian, 2019) and reluctant to seek help and support from the institutions they are attending (Tung, 2016).

Some universities have been seen to lack cultural sensitivity when teaching Chinese students (Ho, 2017), with examples of international students seeking legal redress for poor-quality teaching (Busby, 2019). According to the 2019 Quacquarelli Symonds (QS) survey (Linney, 2019a), teaching quality was the top priority of international students when choosing which university to attend, with perceived lecture quality contributing to this. Data from another QS survey points out how the UK is slipping down the global ranking of universities while countries such as Australia are rising (Linney, 2019b). This UK's position in the ranking is an important factor in remaining competitive in the global market for HE (Cockayne, 2017).

1.4.2 Chinese Universities

Most of my students completed their undergraduate degrees in China. Over the last fifteen years Chinese government investment and policy reform has aspired to develop world-class universities with a more liberal, western style, philosophy of education (Shen, 2019). For universities that show progress towards these aims, considerable uplift in funding is available (Bradsher, 2013). The overall policy goal is to expand the scale of quality higher education provision in China (Office for Students, 2022).

However, in reality, very little emphasis has been placed on the skills associated with a liberal education, such as critical thinking (Scheuer, 2015). Where critical thinking is being taught, it is often in a very mechanical way that ignores more philosophical issues such as dealing with doubt and uncertainty, and teaching students to accept

that there might not be a correct answer to a question (Li, 2017). According to Ryan (2019), despite attempts to borrow pedagogy from western universities, many of the associated higher-level skills are still not fully understood or taught by Chinese educators; for example, the thinking skills of synthesis, evaluation and making ethical judgements.

Chinese educational principles have a deep-rooted tradition of rote learning at all levels of the system (Zhaoguang, 2018). In their comparative study of pedagogy in Chinese and US HE Donnellan and Edmondson (2019) conclude that, even though there have ostensibly been reforms in recent years, the Chinese system is still very much based on the belief that memorising and understanding subject content leads to a high-quality outcome. This view is echoed by other studies (e.g., Gu, 2008; Wong et al., 2015).

It would be tempting to think that students who were drawn from an HE system that values listening would be equipped with the skills necessary to benefit most from traditional university lectures. However, lectures can be exceptionally problematic for Chinese learners (Warwick, 2008). Students from China are entering a very different HE system to the one they are familiar with and face considerable obstacles to learning (Ecochard & Fotheringham, 2017).

1.4.3 The Situation at the UNE

In the 2019 International Student Barometer (ISB) only 17% of international students at the UNE strongly agreed with the statement that their course was good value for money (data drawn from a 2020 UNE presentation on the ISB). This compares with an average of 23% across the Russell Group universities. The 2018 HEA Student Satisfaction Survey (HEA, 2018) indicated a steady decline in the perception of UK higher education by non-EU students, with teaching quality being the second most significant reason for this view. Students of Chinese origin were by far the least satisfied group. This data was collected pre-COVID 19, so it should be noted that

student perceptions of teaching quality generally fell further during this period - when most courses were delivered online (Mitchell, 2022).

Given that international students pay significantly higher course fees than domestic students, and generate high levels of revenue, their dissatisfaction with teaching should be of concern to UK universities. At the UNE, the 2023/24 MSc fees for a course in the School of Management are, for (non-EU) international students, £26 700; this compares with £12 970 for UK nationals (data drawn from the UNE website). Increasing the number of international students is a key objective of the institutional strategic plan (based on UNE internal documentation). In recent years, students from China have dominated this increase. In 2022 the UNE had approximately 2 800 Chinese students, by far the largest proportion of international students. In the School of Management, in many postgraduate modules over 95% of students are Chinese (data drawn from the UNE website). If students have successfully demonstrated that they have achieved the level of academic achievement and linguistic ability to enter a UK university it is assumed that they should, by implication, be able to access teaching, undertake the necessary learning, and complete their chosen programme of study.

1.5 My Starting Point

Janesick (2000) argues that qualitative researchers often begin with “a question, or at least an intellectual curiosity if not a passion for a particular topic” (p. 382). My starting point developed partly from curiosity but partly from being convinced that there was an important gap in the existing body of knowledge.

Having worked in the sixth form sector for most of my career, delivering lectures to large groups of students felt like a career change. I was determined to ensure that the literature on best practice informed my teaching but was surprised and disappointed to find that very little literature existed concerning how to lecture well, and nothing directly addressed how to deliver impactful lectures to large groups of international

students. However, a wealth of literature explains how difficult it is for international (mainly Chinese) students to navigate western and UK universities (Henze & Zhu, 2012; Tung, 2016). There are some insightful guides to teaching international students (e.g., Carroll & Ryan, 2005: Ryan, 2012) and some texts that focus on how international students can develop specific academic skills (e.g., Bailey, 2017; Read, 2019). The most comprehensive guide to teaching international students is the Advance HE resource pack produced by Lomer et al. (2021), a resource that is replete with excellent advice on developing pedagogy for international students. Advance HE emphasises how important it is to support international students and has provided training opportunities designed to encourage practitioners to reflect on how the UK Professional Standards Framework can be applied to international students (Borthwick et al., 2014). Advance HE has also published research focused on raising awareness of the difficulties international students face (e.g. Lu, 2022). Nevertheless, the practical and evidence-based teaching methods, and specific pedagogical tools, that I have applied in a college context (e.g., Black & Wiliam, 2005; Hattie, 2012) are largely absent. For example, Carroll & Ryan (2005) devote no more than two pages of their edited book *Teaching International Students* to how practitioners can enhance lectures delivered to international students. It seemed to me that there was a need for practical, well-researched techniques for teaching, specifically lecturing, to international students in HE to be produced, with a clear focus on taking an ethical approach to international student pedagogy (Ploner et al., 2022).

I was consequently motivated to embark on a doctorate in education (EdD) and seek ways to enhance my own professional practice and potentially that of others. Universities that claim to be ‘international’ in outlook should take their responsibilities to international students seriously. These responsibilities include ensuring that the teaching methods used are suitable for an international audience and that international students have a high-quality learning experience without compromising on challenging course content or high assessment standards. This statement obviously reflects my own educational values and beliefs, but as an action researcher these are of foremost importance in determining my research priorities, assumptions, and direction (McNiff, 2013).

As part of the research for Module 3 of my EdD course, I conducted a focus group with ITM students to discuss lectures as a teaching method. The participants explained how one of the biggest problems they had with lectures was understanding and then piecing together disparate conceptual ideas. They indicated a desire for greater clarity with conceptual explanations in lectures and better overviews of how concepts connected and what they could be used for. During the focus group I presented examples of lecture slides. The participants expressed a strong and enthusiastic preference for the slide that used images as metaphors to illustrate the explanation of a management concept; in this case, it was of an ice cube being melted and refrozen to demonstrate the process and challenge of managing organisational change. In short, the students held that the images 'made them think' more than direct illustrations of business activities or text about what was being explained. The participants were explaining the value of a metaphor - where one thing is described as another (Geary, 2011) - in this case expressed in image form. I realised that some of the most entertaining and memorable talks and lectures I have attended included powerful visual representations of metaphors. Also, the weekly academic writing blog Patter (Patter, n.d.) always includes an image; I have noticed that the image used is often a visual metaphor. Furthermore, some of the most engaging literature I have enjoyed has made evocative use of metaphor. For example, Oliver Sacks made imaginative use of metaphor in his writing, most of his book titles and the images used as covers for them, such as with *The Man Who Mistook his Wife for a Hat* (Sacks, 1998).

Another area of research I have previously been involved in is the use of discussion boards (Cotterill, 2021). In 2020 I delivered a training session to university staff in which I themed and illustrated the presentation section using visual metaphors related to tennis (for example, a discussion is similar to a rally). Several staff contacted me afterwards, not to comment on the insights into discussion forums but to explain how I had made a potentially dull topic attractive through the delivery method.

In terms of time allocation, university lectures are the dominant course delivery method, with approximately 60% of student contact time typically devoted to them (THE, 2022). In US universities, STEM lecturers spend about 80% of their teaching

time delivering lectures, most of which are non-interactive in all respects (Grant, 2021). Through my research, it has become clear that many of my Chinese graduate students have completed courses in China that were delivered almost entirely through lectures, with few seminars or tutorials.

Lectures are a key feature of university pedagogy (Hubbard, 2007) and have long been recognised as a highly economical and efficient way of delivering course material (Brown, 1978) as they offer a way for university administrators to create a high student-to-teacher ratio (Banning, 2005; Penson, 2012) and thus take a pragmatic approach to resource allocation (Nordmann et al., 2022). Through lectures, a large quantity of course material can potentially be delivered in a short space of time. Russell Group universities, such as my own, show a distinct trend for increased student numbers in lectures (HEA, 2018). This trend seems likely to continue, fuelled by the rapid growth in university cohorts following increasing entries of international students, domestic A-level grade inflation, and general commercial pressures for universities to grow cost-effectively (Woolcock, 2021).

A 2008 survey-based study undertaken at the UNE (Warwick, 2008) revealed high levels of dissatisfaction by international management students with teaching in general but with lectures in particular. Participants, the majority of whom were from China, expressed a strong preference for learning in seminars rather than lectures. A disappointingly low 64% said they understood lecture content (Warwick, 2008, p. 4). A concern commonly expressed by students was their inability to complete the necessary preparatory reading required to access lecture content.

In 2018 I moderated two focus groups as part of broader research by the UNE into postgraduate management students' perceptions of teaching on their master's courses. A strong view was expressed that lectures were challenging and did not fully meet international students' needs. Participants, predominantly from China, felt, for example, that material was often presented confusingly and that there was little demonstration of how theories and models could be applied to real-world situations or contexts. Concepts were challenging to understand because they were often abstract

or novel. The arguments from participants were similar to those put forward in the focus group I moderated for Module 3. Lectures to postgraduate students often include a fusillade of concepts and complex vocabulary, easily overwhelming students who are not working in their first language.

In early 2020, with a colleague, I undertook a systematic study of intranet communications from core MSc module teachers in The School of Management to students. A common complaint was that students were not engaging with lessons and that attendance at many lectures was poor. It should be noted that this was at a time when recordings of lectures were not always available, and there was an expectation that attendance at lectures was an integral part of the learning experience. I continued to monitor these communications into late 2023, and the same engagement problems persisted.

1.6 My Area of Concern

1.6.1 My Choice of Focus

For my doctoral research, I decided to evaluate the use of one particular teaching technique - using visual metaphors to support the explanation of abstract concepts in the context of lectures and to help improve the learning experience. The choice of this tool is not arbitrary; it is a technique that through initial research (see section 1.5) I came to believe might be of distinct value when teaching international students. There is a wealth of literature that connects metaphorical reasoning with the development of understanding (e.g., Gentner, 2003, 2010; Lovett & Forbus, 2017; Penn et al., 2008). I wanted to explore whether the technique of using images to represent metaphors would be effective as part of my instructional design, instructional design being defined as the process of deciding upon instructional goals, designing, and developing instructional materials and strategies, and evaluating the effectiveness of the instruction (Khalil & Elkhider, 2016). As will be discussed in section 2.7, although there

are concerns about the effectiveness of lectures as a teaching method, they remain ubiquitous in HE pedagogy.

I have consequently become interested in how effective the *deliberate* use of visual metaphors in instructional design might be as a pedagogical tool, specifically in lecture-based expositions. I thought the strategic use of images deployed in this way as a teaching tool might help enhance the quality and accessibility of expositions in a lecture format to international students, presenting such images as *replacement metaphors* (Phillips & McQuarrie, 2004) where the image is a substitute or enhancement for text and spoken word. Using the technique in my own teaching context might be particularly worthy of investigation, as I reasoned that it could be a way of bridging a cultural and linguistic gap in a situation where complex, often abstract, concepts are being taught.

Most of the abstract concepts in the ITM course are what can be termed *threshold concepts*. These can be defined "as akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress" (Meyer & Land, 2003, p. 412). To enable students to understand the content of the ITM course and to access the teaching on their destination programmes, threshold concepts need to be understood and many of these are complex or abstract.

1.6.2 My Students, Chinese Students

Conducting research with my own students was within my locus of control (McAteer, 2013). As module lead for ITM I have control over most aspects of the delivery of the course, giving me latitude to conduct research in the way that I wanted to.

In a typical cohort, over 90% of the students on my ITM course are from China; I have therefore focused on meeting the needs of learners of this particular nationality. This group, as explained in section 1.4.1, seems to be representative of international

students who experience substantial obstacles to learning. However, I would emphasise that I am not attempting to 'other' Chinese learners by pushing them into a subordinate category (Modood & Thompson, 2022). On the contrary, my research values the insights that are particular to Chinese students and attempts to demonstrate how pedagogy can be enhanced by capitalising on their contributions to the research process. I also recognise that Chinese learners are a heterogeneous group with diverse educational and cultural backgrounds (Heng, 2019). I have been wary of using the term *Chinese students* or *Chinese learners*, but the fact remains that almost all of those I teach are Chinese and that many of them find the UK postgraduate HE system challenging.

1.6.3 Worthwhile Educational Research: An Opinion

Pring (2004) contends that much educational research has failed to help teachers with their professional practice, and that even the language of educational researchers is often detached from that used by practitioners. This view reflects criticisms of educational research outlined in the Hillage Report (Hillage et al., 1998). I feel that educational research that directly addresses ways in which the quality and potential impact of education can be improved is the most worthwhile and wanted to contribute to this. AR offered a structured format for exploring how my practice could be enhanced (Kemmis et al., 2014a) and has therefore been used as a research methodology for the inquiry.

I value research that is designed to produce authentic and meaningful change (Vaughan et al., 2019), rather than to simply produce new knowledge for its own sake (Newby, 2014). My decision to use AR was largely based on wanting to know more about my own professional practice and how to enhance it (Kemmis et al., 2014b), while hoping that my conclusions might find some resonance with the practice of others (Tracy, 2010). To support this aim, I also wanted to produce a "readerly text" (McNiff & Whitehead, 2009, p. 49): a thesis that was easy to read and communicated my thoughts clearly to others.

The quality of instructional design is acknowledged to be one of the most powerful influences on achievement (Hattie, 2012). It has been argued that those educators who would most benefit from learning more about effective teaching methods are the very ones who disregard advice and research findings (Oakley, 2017). If I can make my findings attractive and accessible to others, I view that as a positive outcome. Without resonance with others, I fear that my own research will have minimal value or impact.

The proposition that university lecturers require training in how to teach is a relatively new notion (Mann, 2016a). While most schoolteachers undertake extensive and ongoing training, in many universities having gained a doctorate and published research findings is often seen as a proxy for being recognised as a good educator (Wolff, 2006). Even for those HE teachers who understand and take an interest in how learning happens, this understanding is only sometimes capitalised upon in their teaching (Fry et al., 2008). Research findings that resonate with practitioners will be more easily accepted by them and have the greatest impact on enhancing their practice.

1.6.4 Metacognition Problems

Metacognition is the process of thinking about one's own thinking (Flavell, 1979) or being able to recognise the mental state that one is in (Semerari et al., 2012). This necessitates someone becoming aware of the working of their mind (George, 2018). Nelson and Narens (1990) distinguish between metacognition as *monitoring* and metacognition as *control*; it is the former that I have encountered as an issue in my research. In this context, executing metacognition involves research participants showing awareness of and assessing their own learning and comprehension (Glenberg & Epstein, 1985). Metacognition as monitoring is "the ability to assess the validity of your own knowledge" (George, 2018, p. 275), implying the ability to interrogate and evaluate the significance, causes and quality of one's thoughts. According to Quigley et al. (2018) - Alex Quigley is Content Manager for the Education

Endowment Foundation - metacognition requires learners to evaluate the strengths and weaknesses of their learning or the strategies they use to learn. For my study, I wanted to know *when*, *how* and *why* my participants believed that learning was taking place and how my pedagogic strategies and instructional design affected this process.

Asking participants to talk about their learning is a challenging, metacognitive task (de Blume et al., 2017). Learning may be something that they are unable to articulate easily or self-calibrate (Serra & Metcalfe, 2009). An added complication is that students are not always aware that learning has occurred, as learning may be *implicit* or *explicit* (Blakemore & Frith, 2005). With explicit learning, students recognise the cognitive change that has occurred as a result of learning, but with implicit learning, this is not recognised or readily apparent to them. Furthermore, students are often unaware of what learning strategies and instructional designs are most effective or why (Karpicke & Roediger, 2008).

Executing metacognition is problematic because it involves accessing the stored beliefs that someone has about cognition (Flavell, 1979). It requires the engagement of *system 2* thought; this is the slow, deliberate, and effortful thinking described by Kahneman (2011). Also, the ability to demonstrate metacognition varies widely between individuals (George, 2018). Retrospectively reflecting on learning adds another layer of difficulty, as recollections of learning (reported as past events) may be highly unreliable (MacKay, 2019).

A further complication for my study was that my participants were international students, operating in a second language. This added an extra difficulty for them as they were attempting to draw on the English vocabulary required to articulate their metacognitive reflections.

1.7 Conclusion

This chapter has provided the contextual background and the rationale for my research. International students are financially valuable to UK universities and provide welcome cultural diversity. HE has become a global market with countries and institutions competing to attract international students. However, many of these students face challenges accessing the teaching and learning offered, challenges that Chinese learners find especially great. My research has been designed to contribute to knowledge in the field of instructional design, with a focus on teaching international students. I have briefly explained why I have chosen to focus on the use of visual metaphors but will explain the justification for this choice in more depth in section 2.13.

Chapter 2: Literature Review

2.1 Introduction

This chapter explores the literature that forms my research's conceptual, theoretical, and contextual foundations. It critically evaluates the existing body of knowledge and places my work into where it is incomplete by answering the following broad questions:

1. How do students understand and find meaning?
2. Why are abstract concepts so challenging to understand?
3. How are international students represented in the current research literature?
4. What is the cultural context of international students' participation in UK HE?
5. What are the purposes, strengths, and weaknesses of lectures?
6. What are metaphors, and how does conceptual metaphor theory help to frame our understanding of them?
7. What distinguishes a weak from a strong metaphor?
8. What makes an image interesting?
9. How effective are metaphors, and visual metaphors, as teaching tools?
10. What research has been undertaken to evaluate the use of visual metaphors in teaching?

I identified literature relevant to answering the above questions using Google Scholar as the primary search platform and basing the searches on the concepts contained within the questions. Where necessary, literature was accessed through the UNE library portal or the Huddersfield University Summon portal. The initial searches looked for material published from 2016 onwards. I then used the "snowball technique" (Ridley, 2012, p. 56), identifying what appeared to be relevant material using the references from the papers in the searches. I also sought out literature, primarily books, on learning and learning theory relevant to HE, focusing on texts written by experienced academics, researchers, and practitioners. Some valuable initial search

prompts were provided through listening to presentations on academic practice at the UNE and Huddersfield University.

2.2 Knowing, Understanding and Finding Meaning

Because the terms will be used so frequently in this thesis, it will be helpful to distinguish between knowing, understanding, and finding meaning. Each may be a stated or desirable goal of instruction but enabling learners to find meaning is often the most challenging to achieve (Pearce, 2022).

Remembering facts, or pure knowledge accumulation, is little more than *surface learning* (Penson, 2012). Surface learning is passive, for example basic memorisation of material, while *deep learning* is active, challenging, and personal (Phillips & Graeff, 2014). For deep learning to occur, there needs to be an understanding and comprehension of the material taught built on strong knowledge foundations (Penson, 2012; Lunn Brownlee et al., 2022). Knowledge in isolation does not equate with understanding or *finding meaning* (Wiggins & McTighe, 2005).

Understanding material moves beyond knowing material. Dewey (1933) held that understanding involves finding meaning in something in terms of what causes it, how it functions, its consequences, what value it has, and how it relates to something else. As humans, our brains “have a strong preference for meaning over randomness” (Carey, 2014, p. xiii) and strive to impute meaning to almost anything they are asked to process. For Mayer and Moreno (2003), *meaningful learning* involves the learner developing a deep understanding of the material. Reaching this goal may be achieved through instructional design that helps the learner combine new information with elements of existing information (Weinstein et al., 2018). Mayer & Wittrock (1996) have argued that this type of learning enables what has been taught to be transferred into new contexts, making it particularly useful.

People find meaning in different ways, perhaps from spoken words, written text, or images (Jewitt et al., 2016), and may even move across modes in the search for meaning. This process of moving meaning from one mode to another (for example, from written text to an image) is known as *transduction* - a social semiotic term (Angelo, 2016). Gibson (2000) describes learning itself as the process of finding meaning and establishing what is distinctive while Ignelzi (2000) describes the process of making meaning through learning as "how individuals make sense of knowledge, experience, relationships, and the self" (p. 5), a reflection of the view that making meaning involves gaining an appreciation of how the components of a body of knowledge are related (Kvanvig, 2003) or as Wiggins and McTighe (2005) write "understanding is about making meaning of facts and transferring knowledge to other problems" (p. 46). Without finding meaning, learning will be shallow, and concepts will be more challenging to remember and take into other contexts (Pearce, 2022).

When we are taught, understanding is how we make meaning from this knowledge, a process involving more than simply communicating facts (Angelo, 2016). Furthermore, when we find meaning in the information presented, it becomes easier to learn, understand and remember (Blakemore & Frith, 2005). Hattie (2012) argues that achieving this deep learning involves enabling learners to find meaning in material and that expert teachers are best placed to facilitate this aim. One of the characteristics of expert teachers, according to Hattie and Jaeger (2003) - who evaluated approximately half a million research papers related to influences on student achievement - is that they can ascertain and effectively combine what learners already know with new information, resulting in deeper processing, meaning-making and knowledge integration. It is apparent that with instructional design, "relevance clearly enhances meaningfulness and academic performance" and that "relevance-enhancing strategies have been consistently shown to be more effective in enhancing motivation and learning performance than other embedded strategies" (Means et al., 1997, p. 6).

To summarise, gaining an understanding involves forming connections between potentially diverse elements of knowledge, forging links with prior knowledge, being able to generalise to other contexts, and ultimately finding in material both resonance

and meaning. High quality instructional design should be mindful of these elements, particularly when content includes complex or abstract concepts.

2.3 Abstract Concepts

If finding meaning is a desirable but challenging goal of instruction, finding meaning in abstract concepts may be even more demanding (Kirschner & Hendrick, 2020). In this section, abstract concepts will first be defined and explained, before discussing why they are often difficult for learners to comprehend.

Sword (2012) contends that “All scholarly endeavor involves abstract concepts” (p. 53), reflecting the inevitability of encountering such concepts in academic study. Thomson (2023a) explains the *way* in which abstract concepts are often used: “Academic disciplines typically use abstract nouns to encapsulate highly complex concepts” (p. 173). The academic world is replete with complex concepts, many of which are expressed in an abstract form.

“Concepts are the basic units of cognition” (Harpaintner et al., 2018, p. 2), but abstract concepts differ in that they lack physical or perceptual features (McRae et al., 2018). As such, they lack form, colour or texture and may be very difficult to visualise (Harpaintner et al., 2018). An abstract concept, for example, *freedom*, can be contrasted with a concrete concept, such as a *table*, in that the former is not easily connected with a single object or image while the latter is easily perceivable as an image or physical object (Borghi et al., 2018).

While abstract concepts are often vague and difficult to understand (Kirschner & Hendrick, 2020), concrete information is normally highly accessible (Paivio et al., 1994) and is more easily recalled from long-term memory (Paivio, 1968). Abstract concepts may refer to complex situations where multiple entities are involved (Barsalou, 2003), and variable responses and interpretations to them are expected by different individuals (Borghi & Binkofski, 2014). An example of such an abstract

concept is the term *risk*, which is open to multiple interpretations, contexts, and levels of significance.

One of the reasons abstract concepts are challenging to process is that they are difficult to imagine and, in many cases, cannot be converted into something that can be *directly* visualised or given a physical form (Blakemore & Frith, 2005). Furthermore, the lack of familiarity with an abstract concept means that it may be perceived as lacking relevance which compromises its meaning, as Means et al. (1997) explain, "Relevance is a function of meaningfulness, and meaningfulness is established by relating new ideas to existing knowledge" (p. 13). Personal relevance to and resonance with the learner further enhances meaningfulness (Ross et al., 1989), which may be absent with many abstract concepts. When a concept resonates with us and has familiarity, it is easier to find meaning in it. McRae et al. (2018) used an experimental approach to explore how undergraduate students make sense of abstract concepts; they concluded that the understanding of abstract concepts is closely linked to observing relationships *between* entities, especially where people and their characteristics are involved. Comparing an abstract concept with something concrete is a way in which humans seek to locate meaning, something that a metaphor is ideally placed to do.

For students learning in a second language, abstract concept vocabulary provides additional obstacles. In tests, they have been shown to be more challenging to learn and remember than concrete vocabulary (Ellis & Beaton, 1993; De Groot & Keijzer, 2000). To add a further layer of complexity, different cultures have their own specific interpretations of abstract concepts primarily shaped by cultural conventions (Deutscher, 2010). Unsurprisingly, words that are used less frequently by bilingual students are more difficult to retrieve (Costa, 2020); it seems reasonable to assume that abstract concepts fall into this category.

To conclude, abstract concepts are often difficult to understand unless they can be connected to a pre-existing element of knowledge. Metaphor use may be a way of

forging that connection, by connecting the familiar with the unfamiliar (Memon, 2021) and is explored in sections 2.9., 2.10 and 2.11.

2.4 International Students' Participation in UK HE: The Research Landscape

The large body of academic work exploring the experiences of international students has steadily evolved over the last forty years, although arguably this evolution has been disappointingly slow (some examples of research findings are described in section 1.4). During the 1980s much of the research was focused on the culture shock experienced by international students and the difficulties they had with assimilation into the UK HE system (e.g. Furnham & Bochner, 1986). Research in the 1990s began to examine the social relationship issues that international students experience (e.g. Furnham & Li, 1993). More recently, research has explored how HE pedagogies can be made more inclusive for international students (e.g. Lomer & Mittelmeier, 2023) and the lens through which research is conducted has been adjusted to investigate issues such as power and dominance, with some academics employing a higher level of criticality (e.g. Yao et al., 2019). The types of data collected has also changed, with researchers moving away from a quantitative, survey-based approach to a more qualitative methodology (Mittelmeier et al., 2023).

According to Caruana and Spurling (2007), a fundamental problem with much of the research into the international student experience is the way in which it assumes that international students must make an adjustment in *their* approach to learning. By making this adjustment a deficit is thought to be corrected and academic success becomes feasible. Research has thus been centred on the *deficit model* (Montgomery, 2010) with studies often being framed by a set of predetermined expectations which international students are expected, and often struggle, to live up to (Page & Chahboun, 2019). Such research is commonly based on presenting a particular western pedagogical framework as an ideal (Spangler & Adriansen, 2021).

In their review of the existing literature Mittelmeier et al. (2022) assert that a very limited number of studies have involved working *with* international students to explore and seek improvements to pedagogy. Furthermore, few studies have shown any demonstrable impact of initiatives on the international student experience. They conclude that where initiatives are justified in terms of impact, they are often "active, playful, creative, co-created with students and meaningfully centred international or intercultural learning" (Mittelmeier et al., 2022, p. 28).

2.5 Culture and Social Framing: The Implications for Research

In the context of the teaching and learning experience of international students, Montgomery (2010) defines culture as "a set of beliefs and values that underpin a perspective of Higher Education" (p. 3). However, culture is a highly complex concept, not least because the beliefs and values that it is based on are not always easily observable in a situation or institution (Oxford & Anderson, 1995).

The work of Hofstede (2003), with its quantitative approach to measuring cultural dimensions and differences between them, has arguably contributed to oversimplification and stereotyping by claiming a rigid link between nations and specific aspects of culture (Holliday, 2010). As Montgomery (2010) warns, "a nation is not a culture and variations within nation states can be as wide as across them" (p. 14). International students do not always identify with the culture of their country of origin, meaning that a simple visa-based classification of culture types is potentially misleading (Bennett et al., 2023). Furthermore, using broad terms such as *East* and *West* to describe culture is problematic as these geographical classifications are not based on values, but primarily on social and economic circumstances (Montgomery, 2010). Language is also a flawed method of grouping students as not all international students are second language speakers, a characteristic rarely made clear in the literature (Mittelmeier et al., 2022).

Stereotypes are damaging; they form filters through which we view individuals leading to generalisations, misunderstandings, and othering (Tran & Hoang, 2023). Stereotypes impact the teaching and learning environment as they affect how individuals (both teachers and learners) perceive each other, which in turn affects behaviours, responses, and actions. Chinese students, in particular, have been victim to extreme stereotyping (Heng & Lu, 2023), which may have contributed to some of the abuses and issues described in section 1.4.1.[3]

The way in which social situations are culturally framed can have an impact on an individual's thinking (Goffman, 1974). As Stolte and Fender (2007) explain, "a given social value framework distinctively configures a person's thoughts, feelings, and actions within the confines of the social situations at hand" (p. 60), although the framing could equally be based on the language an individual uses (Ross et al., 2002). Research into bicultural individuals, those who have internalised two contrasting subcultures, indicates that they will shift between interpretative frameworks depending on the cultural cues to which they are exposed, using influences drawn from their internalised subcultures (Hong et al., 2000). Hong et al. (2000) argue that the way in which international students think and interpret is affected by how external cues activate constructs that they have internalised based on their cultural background. Furthermore, the extent to which they are exposed to external cultural cues will impact how quickly they acculturate into another culture, by gaining greater control over the cultural switching process. Thus, incorporating quintessentially UK material in instructional design, such as using images of a union jack flag in lecture slides, may help to activate and strengthen the UK cultural knowledge networks of non-UK students and make it easier to take a UK cultural perspective. However, the original cultural lens will remain available and can also be turned on by exposure to appropriate cultural cues.

Social framing theory has powerful implications for international students and research with them; they may have internalised one culture but internalised, or begun to

[3] For example, a common stereotype of Chinese students is that they are passive (Karram, 2013) or uncritical (Song, 2016) learners.

internalise, another while being educated abroad. At the same time, the cultural cues that they are exposed to may influence the way in which they interpret material. This changes the way in which the influence of cultural knowledge is conceptualised; rather than being a specific lens through which to view the world, for bicultural individuals the lens may be switched with a consequent shift in their thinking (Hong et al., 2000). Much of the deficit model research implicitly assumes that international students need to suppress their internal subculture and embrace the subculture of the country that they are studying in. However, a recognition of the way in which cultural framing can influence thinking may be valuable. A discussion of the importance of culture to this study is explored in Chapter 5 (Theme 5).

2.6 Opportunities for Better Research with International Students

Mittelmeier et al. (2022) emphasise the opportunities that researchers have to centre internationalisation itself, rather than to base their work on responses to the presence of international students in UK HE. Much of the research, such as that described in section 1.4, has focused on problems experienced by international students, rather than providing concrete approaches to help improve their experience by harnessing their input (Mittelmeier et al., 2022).

The choice of language used in research should also be given greater attention. English may be the dominant language of the classroom in UK HE, but does not have to dominate research thinking (Fay et al., 2023). Research using images can go further by helping to decentre the reliance on language as a means of communication (e.g. Huang & Cockayne, 2023). According to social framing theory, concepts may be formed and understood differently according to the language used; hence seeking understanding in other languages can form valuable insights. Page and Chahboun (2019) argue that over recent years there has been a distinct shift in the focus of the literature towards increasing the authentic voice of international students in research. Section 3.10 includes a discussion of the issue of language choice in research.

Ultimately, the emphasis on the deficit narrative in research has become more subtle than two decades ago, but is still prevalent (Lomer & Mittelmeier, 2023). Academics such as Mittelmeier et al. (2023) are pushing for a more enlightened and critical approach to research with international students. Through their research and publications, they urge a move away from the deficit narrative towards an exploration of issues that have been ignored or dismissed. They also suggest that research should better value international students' contributions to knowledge. There are still opportunities to explore hidden aspects of culture (Beck, 2023) and the extent to which students' cultural framing impacts on the learning experience, and can be manipulated, is worthy of further consideration. Importantly, more research is needed into how pedagogy can be improved to better meet the needs of international students (Deuchar, 2022). Such improvements would help to enhance the learning experience for all students in UK HE.

2.7 Lectures

Lectures are the primary mode of instruction that this thesis is focused on. To provide a robust contextual foundation for the research, this section explores what lectures are and what their purpose is assumed to be. It also evaluates the effectiveness of lectures and discusses the limited literature on the international student experience of them.

2.7.1 What are Lectures?

A lecture is generally regarded as an exposition with a teacher presenting ideas to an audience, the expectation being that the audience will listen, engage, and, consequently, learn something (Eng, 2017). The traditional concept of a lecture in higher education is "a didactic transmission of material that students passively receive" (Mann, 2016a, p. 160). While technology and attempts at interactivity, for example using responseware, have changed the nature of lectures, they remain a predominantly didactic teaching method that involves an individual attempting to

communicate knowledge and conceptual ideas to others. Even with the COVID-19 pandemic forcing most HE educators to deliver lectures using screencast software (Camacho & Legare, 2021) the essence of lectures as expositions remained.

The conventional view of how a lecture functions is depicted in Figure 1. Here, the lecturer communicates with an audience using various techniques such as spoken words (verbal) and images. The learner perceives the information transmitted by the lecturer and, if they pay attention to the material, move it into their working memory for processing (Brown & Atkins, 1988).

2.7.2 The Purpose of Lectures

Bligh (2002), an experienced practitioner who bases his recommendations largely on the research of others, argues that lectures are often regarded by HE teachers as having four key objectives: to enable students to acquire information, to promote thought, to change attitudes and to teach behavioural skills. Through her research, which collected survey-based feedback on lectures from 13 staff and 159 students at a Russell Group university, MacKay (2019) found that students believed that the primary purpose of lectures was to obtain knowledge, reflecting the first of Bligh's (2002) objectives and suggesting an alignment between perspectives of students and teachers. The view that lectures are an information delivery method is espoused by those who deliver university courses in which large amounts of factual knowledge must be communicated, such as pharmacy (Penson, 2012).

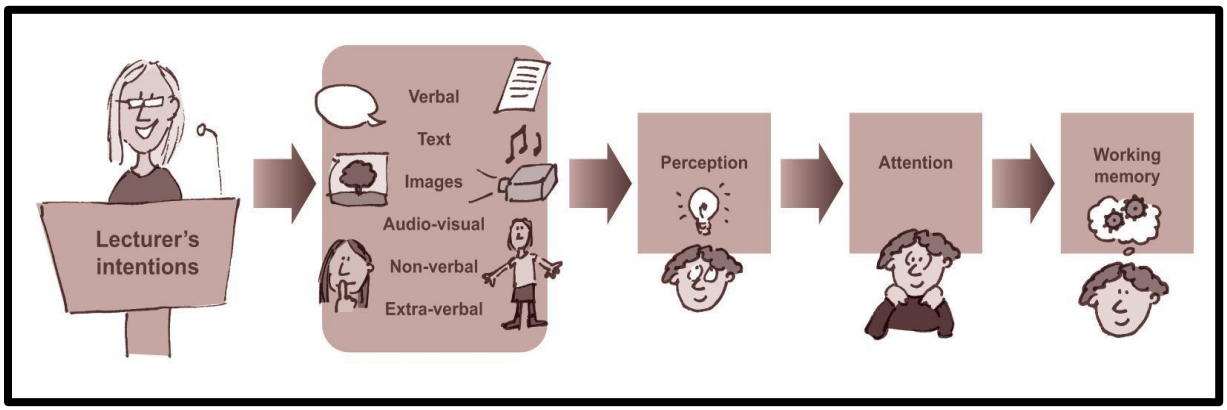
A robust and resilient argument has been that lectures are the most effective and efficient way to transmit factual information to students (Kleinsasser & McKeachie, 1994). Lectures may also be more straightforward for practitioners to prepare than other types of lesson (Hattie, 2023). When courses are structured around a particular textbook or fact-based curriculum content, their use might be considered highly appropriate (Eng, 2017) especially when they from the "backbone of the university learning experience" (Penson, 2012, p. 73). This is a logical reason why, for example,

delivering a high proportion of the content on accountancy courses through lectures can be justified; there is less scope for discussion and a greater need for students to obtain knowledge related to structures, rules, methods, and procedures.

A commonly held belief - seemingly originating from observations of student vigilance with note taking in lectures by Hartley and Davies (1978) - is that student attention spans are so short, potentially no more than 15 minutes, that traditional lectures of up to an hour or more are too long (Nordmann et al., 2022) and are boring (see Appendix 2). However, according to Bradbury's (2016) analysis of the relevant literature, there is little research-based evidence to support this, concluding that attention spans are most likely to vary according to the teacher delivering the lecture.. A sophisticated study by Bunce et al. (2010) used real-time feedback using bespoke electronic devices from almost 190 non-Chemists being lectured to about a Chemistry topic and suggested that attention across lectures was highly variable, often dipping simply because of an external distraction such as a message on a mobile phone.

Figure 1

The Conventional View of How a Lecture Functions



Note. This image is adapted from *Effective Teaching in Higher Education,* by G. Brown and M. Atkins, 1988, p. 9. Copyright 1987 by Methuen & Co. Ltd.

In their survey of literature on what determines attention spans in lectures Wilson and Korn (2007) reached the simple conclusion that attention could be maintained for much longer with teachers who employ high-quality, evidence-based instructional design. Skilled lecturers can make lectures entertaining and informative (Grant, 2021). Providing a clear structure to the lecture engages learners better and stimulates learning (Bartsch & Cobern, 2003), particularly where the focus is on coherence (Sharp et al., 2021). From his survey-based research, Clark (2008) asserted that moving away from lists of bullet points toward the use of images is a simple but effective way in which lecturers can gain and maintain learners' interest. A further advantage of the lecture as a mode of delivery is the high level of control that the lecturer has over the lesson, its content, and its pace (Hattie, 2023).

2.7.3 International Students and Lectures

As explained in section 1.4 international students, especially Chinese students, find UK HE challenging. For international students, lectures pose particular challenges (Devita, 2000; Wang & Shi, 2018). These challenges, which may extend beyond the intrinsic difficulty of the material (Sweller, 2010), can be both linguistic and cultural, with international students often facing difficulties accessing lecture content and gaining little enjoyment or satisfaction from the lecture experience (Reinders et al., 2017).

For international students, language forms an obvious potential barrier to understanding in lectures (Wang & Shi, 2018). Arkoudis (2007) summarises the problems and challenges that international students experience in lectures:

> Understanding lecture content can be difficult for international students. Listening is an active rather than a passive skill, especially for the second language learner. They are processing the words, attempting to understand the main ideas presented and drawing on what they already know to make sense of the material presented in the lecture, in their second language. (p. 9)

Operating in a second language may mean that comprehension is difficult when unfamiliar concepts are encountered in a lecture, especially in conjunction with new vocabulary or lecturers speaking in unusual accents. As Ryan (2005) explains: “The conventional lecture format can present many problems for international students… This is especially true when lectures include large amounts of information and assume certain background knowledge and language proficiency” (p. 96). Mullins et al. (1995) explain the difficulties that international students describe facing in Australian universities. These difficulties include being able to understand what lecturers are attempting to communicate and what are perceived as poor-quality explanations. Even when individual words have been identified and understood by the learner, they may need to fit the context of the presented material (Liu, 2002).

2.8 Metaphors, Similes, and Analogies

Having discussed the relationship between learning and finding meaning and evaluated the use of lectures, this section will explore metaphor. The main focus is to provide a strong and clear definition of metaphors and how they are distinguished from analogies and similes. Achieving this should provide a conceptual foundation for the subsequent three sections, explaining a theoretical framework for analysing metaphor, exploring the literature concerning teaching through metaphors, and discussing what constitutes a strong or weak metaphor.

2.8.1 Defining Metaphor

A metaphor is a way in which the familiar can be used to explain the unfamiliar; a *standard metaphor* (Memon, 2021) is when one thing is described or framed in terms of another (Geary, 2011) and is more formally characterised by being based upon the *resemblance* between two entities or the *domains* that are being compared (Kovecses, 2010). Goatly (2007) provides the following useful summary:

> From a cognitive perspective metaphor can be briefly defined as thinking of one thing (A) as though it were another thing (B), and linguistically this will result in an item of vocabulary or larger stretch of text being applied in an unusual or new way. (p. 11)

The etymological origin of the word metaphor is from the Greek *metaphora,* which in turn is a combination of the terms *meta* (meaning 'over' or 'across') and *phor* (meaning 'to carry' or 'to bear') (Deutscher, 2005). We can therefore consider metaphors as a means of carrying meaning from one domain (a familiar one) to another (an unfamiliar one). Drawing on Goatly's (2007) definition, this carrying over is facilitated by an original approach.

Aristotle believed it was impossible to fully explain something without referencing something else (Pinkard, 2000); *something else* may involve using a metaphor. He argued that metaphors were essential to creating new understanding (Cameron, 2003). Lakoff and Johnson (1980) assert that "the essence of metaphor is understanding and experiencing one kind of thing in terms of another" (p. 5). Significantly, the cognitive processing of metaphors seems almost exclusively based on images, a conclusion reached by Kosslyn et al. (1990; 2021), who have used a range of methods, including brain imaging results, participant diaries and surveys to collect data from undergraduates. Therefore, the process of connecting the familiar and the unfamiliar involves *visualisation*.

2.8.2 Metaphors and Similes

The concept of simile can be subsumed within that of metaphor, as the former is simply a metaphor but with scaffolding (Geary, 2011). The scaffolding provides a clear and explicit structure for the comparison. While a metaphor describes or presents a domain *as* another, a simile describes it as *like* another domain. In this sense, as a literary tool, metaphor is more powerful and direct than simile (Oxford et al., 2014). For example, for Shakespeare to write "Juliet *is* [emphasis added] the Sun" (Shakespeare,

1597/2003, 2.2.3) feels more powerful and evocative than if he had written, ‘Juliet is *like* the sun’.

2.8.3 Metaphors and Analogies

There is no explicit agreement on how the concept of analogy differs from that of metaphor. A straightforward and elegant description of analogy is provided by Küpers (2011), who considers analogical reasoning to be the *process* of relating one domain to another. Gust et al. (2008) embellish and add precision to this description by asserting that the domains are usually different with analogical reasoning. However, with metaphors, the two domains *must* be different.

An analogy can be a way to tell a story (Pinkard, 2000) and can make use of a metaphor to do so. The metaphor may be the way to generate and embellish analogical reasoning, which alone may be nothing more than a statement of correspondences (Glynn et al., 1989), thus making it more understandable, accessible, and meaningful.

Analogies might therefore be defined as the *comparisons* or *connections* between two domains when *using* a metaphor. The comparisons may be based on *structure* or *function* (Mouraz et al., 2013). Metaphors are the *vehicles* used for making these comparisons and may add flourish and interest. An alternative perspective on this distinction is that an analogy *extends* the metaphor (Sword, 2012), explicitly declaring in what way one domain resembles another. Thus, when stated, an analogical comparison will be very direct, whereas a metaphor may be more subtle in order to *contextualise* the analogy. Metaphors involve stating that something *is* (or, in the case of simile, *is like*) something else, while the *explanation* of the comparison is provided through the analogy. The analogy is the *perceived similarity*, whereas the metaphor can be used to convey that likeness. An analogy is *what* is expressed, and a metaphor is *how* it is expressed. Furthermore, a metaphor is *literally false*, whereas an analogy

is *literally true* (Wolff & Gentner, 2000). An analogy is *a documentary*, and a metaphor is *a fictionalisation* or *dramatisation*.

2.8.4 Why do these Explanations Matter?

Considerable space has been devoted to clarifying the differences and similarities between metaphors, similes and analogies. This is important. This thesis uses the term *metaphor* in a way that some literature may disapprove of; as explained, the distinctions between metaphors and analogies, in particular, are subtle. Repeatedly justifying why one situation or example is a metaphor while another is an analogy would be unnecessarily clumsy. Instead, the term metaphor will be used exclusively as the differences between metaphor, simile and analogy are small enough to mean that using one overarching concept does not detract from the conceptual accuracy and central message of this thesis.

2.9 Conceptual Metaphor Theory

With a clear definition of metaphor in place, the principal theory of metaphor that frames this research, conceptual metaphor theory (CMT), will be explained. The vocabulary and conceptual principles of this theory provide the tools and structure for analysing metaphor.

The terms *source* and *target domain* were first independently used by Reddy (1979) and, more notably, by linguistic academics Lakoff and Johnson (1980) to analyse the use of metaphor. Explaining, and more importantly, finding meaning in one domain, can be achieved using some other domain to unlock that meaning; this is *conceptual metaphor theory*. This framework has been presented using other names, such as *mental metaphor* by Casasanto and Gijssels (2015)*, contemporary theory of metaphor* by Lakoff (1993) and *comparison theory* by Levinson (1983) but is most strongly associated with the influential work of Lakoff and Johnson in *Metaphors We Live By*

(1980). Almost every academic paper published since 1980 related to metaphor use cites this book.

CMT uses the concepts of a *source* (or *base*) *domain* (that which is familiar or *concrete*) and a *target domain* (that which is unfamiliar or *abstract*). The concept to be explained is the target domain, the vehicle or way in which it is to be explained is the source domain, and the *grounds for similarity* are the ways in which the two share similar characteristics (Lakoff, 1993). Cognition is *mapped* across the two domains; the target domain is restructured and expressed as a familiar source domain that may be "rich in mental representations" (Semino, 2008, p. 5). Supporters of CMT emphasise that, in discourse, chosen target domains are often highly abstract, with connections to such ambiguous features as time and emotions. In contrast, source domains reflect the concrete and familiar (Semino, 2008). A depiction of the connections between the source and target is shown in Figure 2.[5]

The central message of CMT is that metaphors are not just interesting, clever, compressed, and articulate ways of expressing complex ideas but that they are a *way of thinking* and represent common and conventional patterns of thinking (Lakoff & Johnson, 1980; Lakoff et al., 1999). Their value is far more than stylistic, or what Pinker (2015) describes as the use of "an arresting metaphor" (p. 9) when arguing that metaphors are a powerful way to help share complex ideas with others. CMT advocates hold that the use of metaphor is not merely part of our language and communication but a fundamental feature of human thought, cognition and understanding (Deignan, 2005; Gibbs, 2011; Low et al., 2010). For them, metaphors hold together complex features of the world, connecting the known to the unknown (Cameron, 2003). The use of metaphor is regarded as *conceptual* rather than just linguistic in that it is used to make sense of the target domain (Casasanto, 2009). Analysis of how extensive our use of metaphor is supports this view. For example,

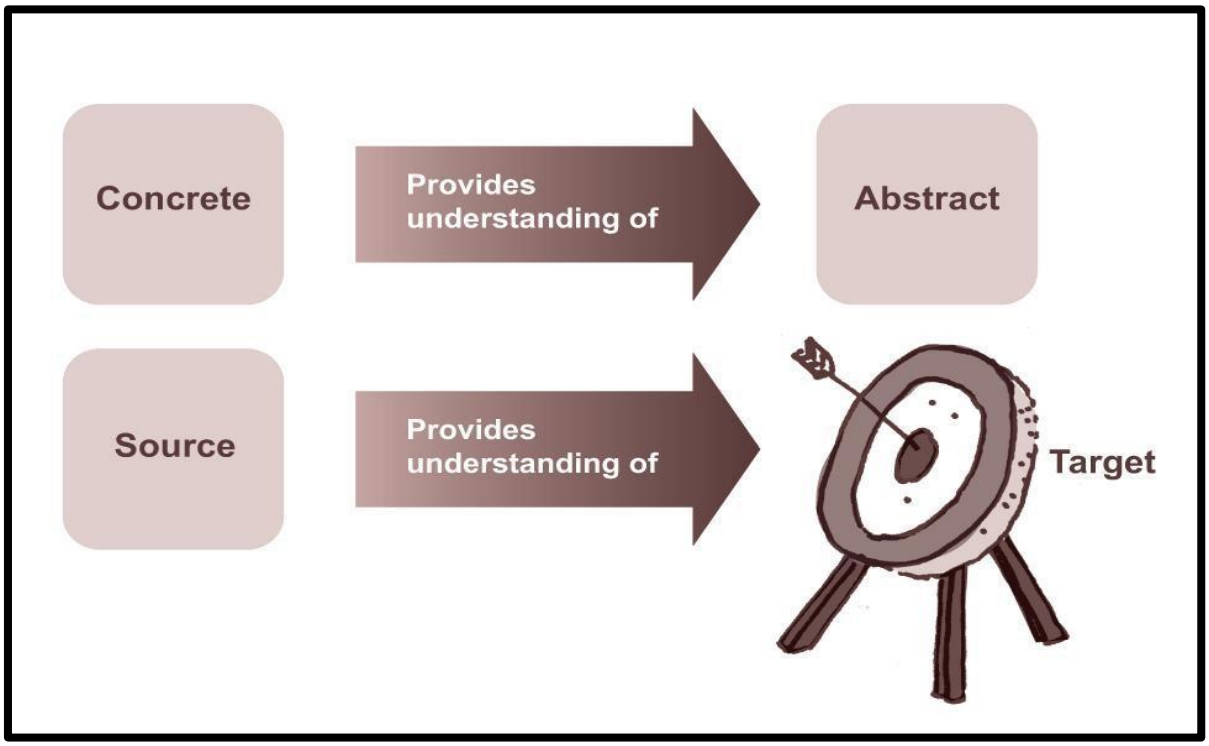
[5] Brain imaging research by neuroscientists from the 1980s onwards suggests that the mapping described by CMT corresponds with neural mapping in the brain (Feldman & Narayanan, 2004), adding validation and foundational strength to the theory.

according to the observations of Hoffman (1983), the average English speaker makes use of over 3 000 metaphors a week and up to four per minute in everyday conversation.

CMT postulates that metaphor is extensively and frequently used for reasoning and understanding and not simply for literary embellishment; metaphor is an expression of the *structure* of thought (Lakoff & Johnson, 1980). As linguist Deutscher (2005) explains, “They have been shown to pervade not only everyday language, but our whole perception of the world” (p. 121). The conceptualisation of phenomena using metaphor is also a form we respond to and create (Lakoff, 1993). Teaching involves reasoning, understanding, and directed thinking; consequently, it would seem that metaphor use is of fundamental value to educators and those who wish to communicate the meaning of complex or abstract concepts to their learners.

Figure 2

The Connection Between Target and Source Domains



2.10 Teaching through Metaphors

Lakoff and Johnson (1980) themselves argue that metaphors can be a valuable feature of classroom teaching and, long before, pioneering neuropsychologist Hebb (1949) explained that metaphors could be used as powerful teaching tools, helping learners to create meaningful connections between what they already know and what the teacher wants them to learn. A source domain's accessibility enables us to understand and explain to others a more abstract or complex target domain (Kövecses, 2002). CMT claims "that abstract thought is only possible through metaphor" (Goatly, 2007, p. 14).

In a teaching and learning context, the concrete can provide a more straightforward explanation of the abstract, enabling a richer understanding of what is outside our direct experience (Thomas, 2010). This approach may be advantageous when the content is challenging (Oakley, 2017). By drawing on existing knowledge, *conceptual growth* is possible, achieving transformative learning experiences (Pearce, 2022). Furthermore, according to educational psychologist Garner (2005), metaphor use in the classroom helps students improve their understanding and knowledge retention and be less intimidated by the learning environment. Educational administrators have also shown support for the use of metaphorical reasoning in the classroom. For example, in 2000, the US National Research Council (Olson & Loucks-Horsley, 2000) expressed how important they believed the use of metaphor was to teaching science.

Keller (1987) reasons that with careful design, instruction can stimulate and inspire students to want to learn. In his ARCS model of instructional design, the acronym ARCS represents *attention, relevance, confidence* and *satisfaction* (Keller, 2009). The bulk of Keller's research was based on interviews with practitioners and was focused on establishing the factors that appeared to contribute to learner motivation. According to Keller (1987), giving learning materials attention and finding them relevant are essential prerequisites for learning. He argues that attention may be achieved by focusing on the concreteness of concepts, while relevance may be achieved using

material familiar from experience. The concrete may be the equivalent of the source domain from CMT.

Lakoff (1993) argues that one of the reasons metaphors are so powerful is that they highlight some aspects of lived experience and minimise others. He also asserts that metaphors are a product of how we interact with our cultural and physical environment; they create a new reality and can help shape thoughts. Most teachers would probably agree that effective learning involves some form of guided or facilitated thought-shaping. Heath and Heath (2007) explain how well-designed metaphors not only enlighten but create “platforms for novel thinking” (p.60). They assert that educators can use metaphors to create insights into complex academic fields (they refer to medicine and computer science as examples). In teaching, metaphor use can also help structure thought and knowledge in a way grounded in existing experiences and understanding (Deignan, 2005).

Careful and thoughtful use of metaphor may add depth and colour to a teacher’s explanation or exposition (Pitcher, 2014) and permit common knowledge to be used to introduce learners to new material. As Fernandes (2008) emphasises, knowledge is not only created but must be transferred or communicated in an educational context. Metaphor use can be an effective way to communicate new ideas to an audience and can impact upon their perceptions and thoughts (Moser, 2000). Metaphors can be used as a powerful technique for not only the *production*, but the *reproduction*, of knowledge and thus may be a way in which teachers can help students to understand the meaning of a new and complex concept using the vocabulary and meaning expressed by another (Vosniadou & Ortony, 1989). Metaphor use also offers an accessible way to operationalise tacit knowledge (Cobb, 2020; Moser, 2000) and thus makes subtle aspects of the unfamiliar more recognisable. Abstract and sophisticated concepts, in particular, are best anchored in realist, non-theoretical terms, according to Oakley (2017), consequently helping to maximise the potential for novice learners to effectively process new information.

Some writers (e.g., Bowers, 1993; Littlemore et al., 2012) have observed that metaphors are an extensively used and natural component of higher education pedagogy, while Pinkard (2000) asserts that metaphors have been used as a tool by many great teachers. The research undertaken by Littlemore et al. (2012) is particularly interesting as they recorded interactions between teachers and students at Spanish and UK universities in a range of settings, finding metaphors used both deliberately and naturalistically in these interactions; they concluded that metaphor use was ubiquitous as a communication method. Mann (2016a) claims that the imaginative use of metaphors reduces boredom, a potential problem with lectures (see Appendix 2). A feature of metaphors is that they offer the ability to communicate complex, abstract information in a compressed and engaging way; in this way, the economy of achieving understanding and making meaning may be improved (Gibson, 2000). Oxford et al. (2014) state that:

> Metaphors make our thoughts more vivid and help to structure our perceptions and understanding, transforming our customary schemata (mental frameworks) and helping us to comprehend more deeply our experiences and what goes on around us. Metaphors thus constitute one of our most significant ways of taking in and processing information, allowing us to build up richer, more complex schemata. (p. 12)

This description is very close to what a good teacher often attempts to achieve through their practice. Karlsson (2008) asserts that “Metaphors make it possible to bring in what we know, but also challenge us to see the already familiar in a new way, in a novel constellation, and from a different point of view” (p. 86). This also implies that metaphor use in teaching may contribute to developing higher-order skills, such as critical thinking and perspective-taking. These are skills that are often difficult to teach (Ganapathy et al., 2017). Thomson and Kamler (2016) explain how they use metaphors to “disrupt people’s habitual ways of thinking” (p. 6) in their doctoral writing workshops.

Hughes (2006) argues that metaphor *creation* is a powerful learning tool. Metaphor creation, he holds, helps to “deepen and develop understanding” (p. 71). Echoing the view of Aristotle, Jensen (2008) believes that understanding and meaning are never truly achieved until a learner creates their own personal model of the situation or metaphor to represent it. Lazar (1996) claims that understanding and generating one’s own metaphors is a valuable language skill. This implies an advantage to using metaphors beyond enhancing the communicative impact of the instructional design; showing how metaphors can be used may enable students to learn how to construct their own metaphors, which may assist them in finding ways to gain understanding independently.

There have been attempts to model the use of metaphors in teaching. Glynn et al. (2007) have presented a basic model for teaching through targets and source concepts. This model involves explaining to learners the features of the target and source and explicitly mapping the similarities and differences. Chiles (2021) suggests offering a range of source domains where appropriate to provide learners with a choice of metaphors. Although these *explicit* approaches to metaphor use might be helpful if a lesson centred around a specific metaphor, in the context of lectures where multiple new concepts are being introduced, the *real-time* impact of using (visual) metaphors is arguably important. There has also been no systematic evaluation of the effectiveness of these models.

According to Moser’s (2000) survey of the available literature, much of the research work conducted to date on teaching through metaphor has been based on its use in teaching science. The perceived complexity and inaccessibility of scientific, academic material may be a reason for this (Oxford Royale, 2023). It has been argued that by using metaphors, teachers may simplify language sufficiently for novices and phase in complex vocabulary in a manageable way to make the material understandable (Lee & Butler, 2003).

The field of science has a long history of using metaphor as a means of representing thought and popularising complex ideas in ways that can be understood by non-

experts or those inexperienced in the subject area (Knudsen, 2003). In her analysis of metaphor in science pedagogy, Knudsen (2003) found that the most extensive use of metaphors was in non-specialist texts, such as introductory general science books, indicating that metaphor was being explicitly used to make science accessible to novice learners. In a 2020 article in the Guardian Newspaper, Malik (2020) described how pervasive the use of metaphor in popular science has become, citing how many scientific phenomena in the public domain are metaphor-based. Well-known examples he referred to include *the big bang, the greenhouse effect*, and *the selfish gene*.

Mouraz et al. (2013) investigated the use of metaphors in postgraduate university science teaching, collecting data using semi-structured interviews and triangulating with class observations. They were interested in observing the extent to which metaphors were used as vehicles for learning and reasoning, the use being either for *interpretive* or *explanatory* purposes. They concluded that the most common use of metaphors was as a *communication tool*; they were used in discourse to enhance the communication of complex material. This is important as how knowledge is communicated strongly impacts the depth of student learning (Garner, 2005) and is an essential feature of impactful teaching. Mouraz et al. (2013) close their research paper by asserting that metaphors have an important role to play in teaching and that they can enhance student motivation and result in “deep knowledge production and acquisition” (p. 109), emphasising the generative *and* communicative value that they may have.

Metaphors can be a powerful way to frame a situation and encourage a particular perspective. Scull (2022) outlines how early practitioners of electroconvulsive treatment described those who were mentally ill as needing their batteries recharged; this metaphor provided an opportunity to promote the therapy as a way of *recharging* the batteries and thus framed it as an attractively clear and straightforward solution to a problem. This framing function of metaphor offers a potentially valuable way for teachers to encourage learners to see a problem, or issue, from a particular perspective.

2.11 Strong and Weak Metaphors

According to Schön (1979), the most powerful metaphors are *generative*, offering fresh perspectives or explanations. A strong generative metaphor may also provide a clever alternative: "they substitute something easy to think about for something difficult" (Heath & Heath, 2007, p. 61). This implies that to be effective, a metaphor must replace the target concept, not duplicate it. A metaphorical comparison that merely represents the target concept similarly might not create the cognitive nudge for learners to think about meaning. Arguably, such a duplicated representation is not a metaphor at all.

Carpenter (2008) argues that metaphor use does not guarantee improved clarity of understanding. He asserts that, chosen appropriately, a metaphor can deepen understanding, provide new insights and challenge existing perceptions. However, the choice of metaphor should be such that it does not mislead by implying mapped connections that do not exist.

Mason (2002) describes metaphors as "useful devices for awakening you in the moment" (p. 78). This might involve the creation of a powerful and vivid image (MasterClass, 2021) which may be responsible for what Heath & Heath (2017) describe as an *insight moment*. This might occur in a lecture, when understanding is achieved, and meaning is unlocked.

A potential problem with using metaphors as a vehicle for teaching concepts is that students need to understand the frame of reference that the metaphor uses (Eppler, 2006). This may be especially true if the context in which the metaphor is placed is not understood (Moser, 2000); for example, should financial auditing be described as detective work, if students have no understanding of what auditing is, they will find it impossible to make use of the metaphor. As Chiles (2021) explains, capitalising on prior knowledge is helpful, but warns of the limitations of relying on pre-existing knowledge: "Our subjects are awash with complex vocabulary that is unfamiliar and

tricky for pupils to comprehend. When we introduce new vocabulary pupils may find it difficult to understand the concept, especially if their prior knowledge is limited" (p. 78).

Earle (1995) cautions against the use of imprecise and *mixed metaphors* (that is, combining two or more incompatible metaphors), while Griffey et al. (1986) emphasise that overly complex or abstract metaphors are ineffective as teaching tools. Glynn and Takahashi (1998) explain, with reference to the teaching of science, that teachers must be attuned to the possible misconceptions that learners might have; if metaphors are employed without due consideration for these, the result may be confusion. As Allan (2007) noted, for metaphorical explanations to be effective and illuminate understanding, the meaning drawn from the source domain must be fully understood by the audience. Furthermore, the relevance of the choice of metaphor should resonate with learners (Garner, 2005) and should be easily understood if it is to be effective (Burkhard & Meier, 2004).

Pitcher (2014) emphasises the dangers of taking metaphorical reasoning beyond meaningful analysis. He discusses using water flow as a metaphor for electrical current, an approach sometimes used by science teachers to introduce learners to a complex concept. He warns that although this attractive metaphor has elementary mapped connections, such as comparing the movement of water through a pipe to electricity flow, there is a danger in relying too heavily on it to gain a deeper understanding. For example, water is visible, but electricity is not; this could lead to learner misconceptions for those requiring more than a superficial understanding. As Carey (2014) explains, metaphors can be useful but may "obscure as much as they reveal" (p. 5).

Students may also use metaphors in their writing to express ideas. In a study of doctoral writing by Mouraz et al. (2013), they concluded that students were reluctant to use metaphors in their writing and very rarely did so. Their misgivings were supported by teachers' reluctance to accept metaphor-based reasoning as creditworthy in academic work. In her study of over 100 guides on academic writing, Sword (2012, p. 28) found that 43% commended using figurative language, such as

metaphor. However, confusingly, approximately the same percentage of these guides were written entirely in formal non-figurative language.

Matlen et al. (2011) emphasise the importance of making high-quality comparisons to maximise the impact of metaphor use as a pedagogical tool. Metaphors are most powerful when learners engage in deep learning by processing the relationship and similarities between the source and target domains (Kurtz et al., 2001). In her study of what distinguishes weak from strong metaphors Cameron (2003), although acknowledging that strength is difficult to evaluate, argues that metaphors associated with clear and easily generated images are the most powerful. Memon (2021) asserts that the most compelling metaphors avoid multiple hidden layers but make the interpreter devote sufficient cognitive effort to make it interesting.

In some cases, poorly chosen or executed metaphors are not merely benign. Gardner (2018) - an influential educational researcher and writer, best known for research that developed the theory of multiple intelligences (Gardner, 1993) - explains that while a metaphor can be a powerful tool in teaching, it can be misleading when not explicitly structured. He recommends that teachers explain which features of it are relevant or applicable when using a metaphor. He argues that it is crucial to direct learners to the most important features of the metaphor and direct their attention away from misleading features so that it is "not allowed to distort or cripple the students' ultimate understanding" (Gardner, 2018, p. 133). This implies that the teacher should make explicit what features the student should focus on, a significant issue when the source concept has multiple potential mappings onto the target. Awareness of common misconceptions relating to concepts should be a part of every teacher's toolkit (Coe et al., 2020). It will help decide what features are important when creating metaphorical arguments.

Metaphorical relationships between target and source domains must be clear, unambiguous, and accurate to cultivate learning (Bowers, 1993). When using metaphors in their teaching, educators should select them carefully, mindful of the constraints imposed by the limitations of learners' existing knowledge, understanding,

and perceptions (Earle, 1995). Choosing metaphors that are vivid, interesting to learners, and understood within their current knowledge framework will be most effective as pedagogical tools (Williams, 1986). When describing high-quality academic writing, Sword (2012) explains that “Stylish academic writers choose their metaphors carefully, harnessing the physical world in the service of the abstract” (p. 104). It is also important to note that metaphors may not always be the preferred vehicle for gaining an understanding because of their potential to mislead.

A metaphor is a powerful tool to help structure ideas and recontextualise and build knowledge (Mouraz et al., 2013). Unfortunately, teachers in higher education may perceive the use of metaphors as oversimplifying material (Oakley, 2017), thus making it *non-academic*.

The ability of metaphors to make the inaccessible accessible means that they have the potential to be an effective communication tool for teachers, helping to improve student attention, interest, and knowledge retention (Pinkard, 2000). However, the scope for metaphors in discourse to provide insights for students operating in a second language may be limited by the language barrier. If images replace words, but the strength of a metaphor is retained, this barrier may be lowered.

2.12 Images

2.12.1 Why Consider Types of Images?

Before discussing visual metaphors, there is a brief overview of the relevant literature relating to images. Explaining what is known about the types of images that generate the highest level of interest and attention helps us understand what makes a visual metaphor powerful or weak. Also included in this section is a discussion of anthropomorphism, a concept that connects closely with some examples of strong visual metaphors.

2.12.2 Images, Interest and Attention

Berger (2008) - an art critic who challenged traditional western cultural aesthetics and influenced feminist interpretations of popular culture (Danuta Walters, 2001) - asserts that “Seeing comes before words. The child looks and recognizes before it can speak" (p. 7). According to Marieb & Hoehn (2007) about 70% of sensory input is visual. By extension, this implies the majority of human communication is non-verbal (Zaltman, 1997) and that most of the brain’s processing activity is used to analyse images (Burkhard & Meier, 2004). There is a consensus that a way to strengthen an individual’s ability to process an item of input is if they find it interesting and pay attention to it (Kiyonaga & Egner, 2013). This attention is in limited supply (George, 2018), and thus, attention being directed on one object requires it to be directed away from another (Wickens, 1980) or priority be given to one item over another (Chun et al., 2011). Looking is an act of choice (Berger, 2008). Images seem better than words at gaining attention and being remembered (Weinstein et al., 2018).

Cognitive neuroscientists have shown that brain activity stabilises when someone gives attention to an image (George, 2018), implying that the recognition and contemplation of an image may be almost meditative. If an image is perceived as interesting, it is more likely to enter the working memory for processing as strong input, not be discarded, and contribute to meaningful and memorable cognitive activity. Interesting images are likely to be more impactful in piquing curiosity and compatible with an educational experience's explorative aspects (Silvia, 2008). Using images in expositions may mean that the easily fatigued top-down focus is strengthened, the tendency to be distracted improved (George, 2018), and boredom reduced.

Kirschner and Hendrick (2020) describe how images can powerfully convey complex ideas. They use the example of *Lady Justice* to represent the abstract concepts of *impartiality, measurement, authority* and *status*. They argue that the image makes understanding the overarching abstract concept of *justice* easier as meaning is more easily found in an image than in the words alone.

Images are a potentially valuable element of effective instructional design; they profoundly impact how we create meaning about what we observe in the world (Quiroga, 2017). Empirical studies with undergraduate students using a quantitative test-based approach (e.g., Bauer & Johnson-Laird, 1993; Glenberg & Langston, 1992), have indicated that visual representations can be more effective for presenting and understanding information than written or spoken words. These findings are supported by the findings from Novick's (2000) and Novick et al.'s (1999) research using generative exercises. Images can also have a more significant impact on feelings and emotions than spoken words (Holmes & Mathews, 2005) and are a powerful way to convince others of the *value* of a concept, as evidenced by their use in advertising (Pink, 2013). Research has also indicated how images can *prime* an observer, influencing their subsequent behaviours and choices (Kay et al., 2004). Significantly, Eppler (2003) argues that the advantages of images over verbal or textual explanations include how memorable the images are and their ability to focus attention and support the process of learning.

2.12.3 What Makes an Image Interesting?

Largely experimental research by psychologists into what makes an image interesting has generated many, often contradictory, conclusions. *What* we see depends mainly on *how* we see and the attention we give to the image (Dutton, 2020). However, it also depends upon our experiences, knowledge, and assumptions (Emmison & Smith, 2000).

When images are divided into *scenes of nature* and *built scenes,* the former is preferred and regarded as more interesting to view (Howley, 2011; Valtchanov & Ellard, 2015). In research that examined the impact of *awe* - defined as encountering something that is so surprisingly vast it requires our existing mental schemas to be updated (Keltner & Haidt, 2003) - Rudd et al. (2012) concluded that powerful experiences, such as witnessing a dramatic image, contribute to the perceived slowing down of time, and the creation of fresh mental schemas. They also deduced that when

awe is a feature of the viewer's response to an image, there is a positive impact on attention. Other research has indicated that landscapes and natural scenes are more interesting than city or urban scenes (Berto et al., 2008; Isola et al., 2014). Although expressing a personal view rather than presenting research-based insights, Berger (2008) argues that when we see a landscape, we attempt to picture ourselves in it, which may create a vivid and memorable moment. Images that represent real-life situations, especially those that resonate with the observer, may be particularly effective at gaining attention and interest (Means et al., 1997).

The correlation between the complexity of an image and how interesting it is seems unclear. Some studies have indicated a greater preference for more complex scenes (e.g. Van den Berg et al., 2016) or that a lack of complexity contributes to less interest in an image (e.g. Wohlwill, 1983), while other studies have concluded that complexity has a strong negative correlation with interest (e.g. Kang & Kim, 2019). In his analysis of 40 academic papers that evaluate image use, Harper (2002) concluded that preferences for complexity may be cultural. Two people who are looking at the same image may interpret it differently, their interpretations influenced by their cultural backgrounds. For example, participants from Asian cultures seem to prefer more naturalistic images than participants from the US (Henderson et al., 2003). Some have argued that our brains have an inherent preference for processing simple information (Dutton, 2020) and that which is more readily comprehensible (Silvia, 2008), implying that less complex images might be found more interesting and more suitable for use in instructional design.

Being able to relate an image to our everyday life may contribute to the level of interest we have in it (Isola et al., 2014). When considering the implications of this, Deutscher (2010) argues that “what common sense finds natural is what it is familiar with” (p. 234). Familiarity seems important in gaining attention and beginning the process of finding meaning, with familiarity depending upon personal experiences and memories (George, 2018). Furthermore, the pre-existing sensory experiences of those exposed to an image may powerfully impact how they perceive it (Kosslyn et al., 2001).

Following their extensive and elaborate experiments with over 180 participants (aged between 18 and 22) using self-reports of image interest, in combination with viewing time recordings and eye scan patterns, Gardezi et al. (2021) concluded that the most interesting images are outdoor landscape scenes, followed by images involving people or cityscapes, followed by aerial shots. The least interesting are indoor scenes. They also concluded that image complexity and colour distribution, or hue, are not factors influencing interestingness.

Research into interest and image choice remains inconclusive. What can be taken from it is that image interest cannot easily be generalised.

2.12.4 Concrete, Abstract, Static or Dynamic?

Another relevant issue involves using concrete and abstract images and images that imply movement. Research by Babin and Burns (1997) into image use in advertising concluded that participants found concrete images more interesting than those more abstract. It should be noted that in advertising, abstraction can be quite extreme, often surreal (Scott, 1994). Others also argue that consumers have a strong preference for promotional material that is based on the concrete rather than the abstract (Ketron et al., 2021). In metaphorical terms, if the abstract is being represented by the abstract, gaining an understanding will be even more difficult; communication using the concrete is superior. Concrete examples provide clarity and remove redundant information (Coe et al., 2020).

Cian et al. (2015) argue that implied dynamism in an image, for example, someone running rather than standing still, can enhance attentional vigilance and strengthen perceptions of abstract concepts. This indicates that, where appropriate, an image that implies movement might have particular merit. Dynamism can be implied in images using techniques such as motion blurring or freeze frames (Bailey, 2021).

2.12.5 Anthropomorphism

There is a natural human tendency to anthropomorphise animals and attribute human characteristics and behaviours to them. Epley (2018) defines *anthropomorphism* as “simply perceiving human-like traits in nonhuman agents” (p. 1), meaning that it does not necessarily exclusively involve believing an animal has human-like features. A car, for example, can be anthropomorphised, and a study has identified how humans even anthropomorphise artificial intelligence-based systems that make judgement calls in sporting events (Wonseok et al., 2021). Wang and Basso (2019) argue that anthropomorphism has a strong and direct connection with CMT (Lakoff & Johnson, 1980) in that we often use non-human metaphors to help us understand and make sense of human actions, attitudes, and behaviours.

Goatly (2007) outlines in detail how we have the propensity to select animals that reflect human characteristics and anthropomorphise them. He explains, "Once one has decided that animal and human nature is more or less, or in the most important respects, the same, one then has to decide which characteristics of animals we share with them” (Goatly, 2007, p. 126).

Epley (2018) argues that our proclivity to anthropomorphise should not be regarded as immature but an important part of the functioning of a normal human mind. He believes that it is a natural part of finding meaning and not just a childhood phase, as Piaget (1929) argued. Anthropomorphism may be regarded as an extension of the theory of mind (Herrmann et al., 2007) in that we have evolved to empathise with others to the extent that we also naturally attempt empathy with nonhumans in order to satisfy our desire to find meaning in the world and what is around us (Epley, 2018). A series of fascinating experiments by Waytz et al. (2010) demonstrated this desire to make sense and find meaning; when individuals were presented with unpredictable or challenging to explain situations, they were more likely to attribute human-like features to the situation as a way of explaining it.

The tendency to anthropomorphise can make animals a valuable source domain for powerful metaphorical constructions. Epley (2018) suggests that one of the reasons why animals are so seductive for anthropomorphising is that they have eyes. This feature may encourage us to relate closely to them and imagine a mind behind their eyes that functions like ours. As a result, empathy is felt, and connections are made between human behaviours and characteristics and those of animals. This feature of anthropomorphism has a demonstrably powerful impact on the level of compassion people feel for the welfare of animals (Loughnan et al., 2014).

2.12.6 Images in Place of Abstract Concepts - An Example

There is little research into how using images to represent abstract concepts can support understanding. One interesting and rare exception is the study by Qadha and Mahdi (2019), which considered how images might be used to teach second language abstract and non-abstract (concrete) vocabulary. Their assumption, based mainly on the work of Şenel (2007), was that a semiotic approach to language learning, using supporting materials in the form of images (Erton, 2006), enhances the effectiveness of learning a second language vocabulary by making it more engaging and interesting.

Using a quantitative, experimental, and test-based approach, Qadha and Mahdi (2019) concluded that there was a positive impact on vocabulary learning of both abstract and concrete words when the teaching used supporting images. However, the focus was only on vocabulary recall rather than demonstrating understanding. What does seem clear is that adapting to a teaching and learning environment in which English is the *lingua franca* (Taguchi & Ishihara, 2018) can be a daunting and overwhelming experience for international students (Ecochard & Fotheringham, 2017) and that learning new conceptual ideas, especially abstract ones, while not operating in one's first language is "not only time-consuming but intellectually challenging" (Robinson-Pant, 2005, p. 129).

2.13 Visual Metaphors

Having explained the meaning and significance of metaphor, and discussed the implications of image choice, this review now turns to the use of visual metaphors. The concept will be defined and the available literature on its use (and potential misuse) in teaching will be explored.

2.13.1 Defining Visual Metaphor

A visual metaphor involves using an image of (or as) the source domain to help explain the target domain; an image is used to convey a message and support an explanation (Petridis & Chilton, 2019). A visual metaphor, therefore, compares a concept with a selected image in order to suggest something. This is a common technique used in advertising; for example, showing a big cat in a car advertisement to suggest speed and power (MasterClass, 2021) and is an example of a situation in which Rose (2007) suggests we use the word “metonymic” (p. 87) to describe a sign or symbol that is “associated with something else, that then represents that something else” (p. 87). A visual metaphor can be distinguished from a metaphor in discourse, the latter being a word-based metaphor traditionally used in literature and storytelling (Boje, 1995). Eppler (2006) provides the following comprehensive definition of a visual metaphor:

> A visual metaphor is a graphic structure that uses the shape and elements of a familiar natural or man made artefact or of an easily recognizable activity or story to organize content meaningfully and use the associations with the metaphor to convey additional meaning about the content. (p. 203)

Forceville (1994) holds that visual metaphors perform the same role and can be analysed in the same way as metaphors in discourse in that they also explain one domain in terms of another. This implies that visual metaphors can be mapped out using CMT (Lakoff & Johnson, 1980) and analysed using its associated vocabulary. For example, the target domain is the concept to be explained, the image is the source

domain used to help explain it, and the mappings are the connections between the target and source.

2.13.2 Visual Metaphor Use in Teaching

The subconscious mind always seeks to find patterns and relationships (George, 2018). Visual metaphors may offer the mind a structure to explore and find these patterns and relationships by connecting the familiar with the unfamiliar. As such, they are potentially valuable in instructional design.

The available academic literature on metaphor use in the context of teaching is primarily focused on analysing metaphors in discourse. Little work has been undertaken to analyse visual metaphors and their pedagogical application, even though non-linguistic metaphors are prevalent in many art forms, including paintings, music and dance (Johnson & Larson, 2003; Taruffi & Küssner, 2019). However, the literature relating to the use of visual metaphors in teaching reaches a broadly positive conclusion that they enhance student motivation. For example, Eppler (2006), a communication scientist who compared participants' preferences of visualisation format, concluded that visual metaphors can increase attention, improve understanding, and improve knowledge recall. Petridis & Chilton (2019) claim that visual metaphors are a valuable method to communicate messages because they increase learner attention; this is crucial to the effective functioning of working memory, meaning-making, and learning. Visual metaphors may therefore be a catalyst for deeper learning. Pitcher (2014) argues that if a visual metaphor is used for illustrative purposes when explaining a concept, then its use would influence the *way* a student thinks. Oakley (2017) supports the use of metaphor in explaining complex ideas on the basis that, where possible, the metaphor is expressed using images.

An interesting example of how a visual metaphor has been used in teaching was described by Kerry Mandulak, a speech and language pathologist, on the *Teaching in HE* podcast (Stachowiak, 2023). Mandulak, who conducts research into stuttering and

teaches a course based on her findings, uses the visual representation of an iceberg as a “conceptual anchor”. One of the skills she teaches is appreciating hidden knowledge (such as the shame of being a stutterer), which she believes an iceberg is ideal for representing. Mandulak takes the visual metaphor through her entire course, asking students to add to a blank image of an iceberg, framing the course topics as they are delivered. Although she has not undertaken any research to explore the efficacy of the technique, she believes it has helped students ground their learning and reflect deeply on complex conceptual ideas.[6]

Survey-based research by computer scientists Burkhard and Meier (2004) suggested that people are highly responsive to information presented through visual metaphors and find it attractive. They claim that visual metaphors are superior to traditional imagery and visualisation to communicate information. Arguably, visual metaphors can improve the process of knowledge transfer (Eppler, 2003), a crucial component of most instructional design. Eppler (2006) asserts that “visual metaphors can be powerful catalysts for knowledge transfer and learning as they support learners in connecting what they already know (the properties of the metaphor domain) with new material (the domain into which the metaphor is being applied)" (pp. 204-205). This assertion mirrors the arguments presented by CMT (Lakoff & Johnson, 1980). When summarising the potential strengths of visual metaphors as a way of visualising information, Eppler (2006) argues that they can “draw attention and inspire curiosity”, that their use “activates prior knowledge about metaphor domain” and that a visual metaphor, therefore “facilitates understanding” (p. 206).

2.13.3 Potential Problems with Visual Metaphors

As with metaphors in general, there are limitations to using visual metaphors as a teaching method. Pitcher (2014) concludes that visual metaphor is helpful to learners

[6] Mandulak is such an advocate of the power of the iceberg metaphor that she is planning to publish a paper focused entirely on its use and pedagogic value (K. Mandulak, personal communication, May 8, 2023).

at the *point of teaching* (i.e. when it is used in an exposition) but that the metaphor itself is often later forgotten. Arguably, if the concept is understood but the visual metaphor is forgotten then the learning process is still successful; the passenger has arrived at the destination and the mode of transport is no longer needed. Pitcher (2014) also warns against effectively pushing the use of a visual metaphor beyond the point where the structure mapping between the target and source domain breaks down and that “beyond that point it becomes a liability” (p. 405). Where the source domain's features exaggerate the target domain's features, the risk of generating confusing conclusions is exceptionally high (Mouraz et al., 2013). As with metaphors, in discourse, with visual metaphors there is scope for misinterpretation of meaning, in this case of the message the image is intended to convey, particularly if the image itself is unfamiliar (Petridis & Chilton, 2019). When the intended message is familiar, learners are more likely to be able to interpret it correctly. Importantly, visual metaphor should not be used to substitute deeper student thinking completely. Learners must take an active approach to interpretation and not rely too strongly upon metaphorical crutches (Mouraz et al., 2013).

Petridis and Chilton (2019) argue that, in some cases, visual metaphors can be more problematic for people to interpret than verbal ones (although their study only had a sample of 20 participants who completed tasks via Amazon’s Mechanical Turk). They asserted that this is because there are more items to process when interpreting the meaning of the metaphor. Coyne (1995) believes that learners may interpret visual metaphors as too playful; in other words, they may not consider them suitable for academic use. Visual metaphors may be useful as a pedagogical tool, but there are potential weaknesses and limitations that teachers should be alert to.

2.13.4 Examples of Previous Research

Little research has been undertaken that attempts to analyse the use of visual metaphors in teaching contexts. Scoping the literature has resulted in four relevant studies that explicitly involve teaching and visual metaphors as pedagogical tools.

Four other studies that have evaluated the use of visual metaphors in educational non-teaching contexts are also briefly discussed. Literature that evaluates, for example, the use of visual metaphors to support discourse (e.g. between teachers or researchers and participants) and not their purposeful use as a pedagogical tool have not been considered, although this section includes a brief summary of a relevant study of visual metaphor use in advertising.

An observational and test-based study by Matlen et al. (2011) on the use of visual metaphor in elementary science teaching at a US school used the image of a peach to demonstrate physical attribute similarities between the fruit and the earth (e.g. the peach's skin representing the planet's crust) and an image of wooden blocks floating in boiling water to demonstrate the earth's convection currents and plate tectonic movements. From their observations and data collected through pre and post testing of 72 participants, they concluded that the technique was effective in that students, when tested, demonstrated a good understanding of the material taught. The researchers concluded that this understanding could be attributed to using a visual metaphor in the teaching. No data was collected through interviews and, significantly, the participants were very young - aged between 9 and 12 years.

Taylor et al. (2018) used visual metaphors to enhance digital storytelling in an undergraduate accounting course at an Australian university. The images they used were relational. For example, an anchor to represent the influential role played by the US dollar in international trade, a crystal ball to represent forecasting, a unicorn to represent an unattainable goal, and the image of a detective to represent the activities of an auditor. The researchers used CMT (Lakoff & Johnson, 1980) to frame their use and analyse metaphorical images in video-based lectures. Data was gathered from participants using surveys (with a large sample of over 450 participants) and interviews (with 18 participants). Comparisons were made between cohorts where the intervention took place and those where it did not. The researchers concluded that using visual metaphors helped improve students' understanding of complex material, improved student engagement and attention, and assisted with developing critical thinking skills and skills with the use and application of models. They proposed that

using non-academic images as visual metaphors in teaching will enhance recall by creating a memorable link with course material and contribute to a deeper understanding.

Kanthan and Mills (2006) investigated the broader use of metaphors in teaching pathology to medical students. Uniquely, the research used images of visual metaphor and incorporated physical props to use as metaphors, e.g., using a toilet roll for a vessel lumen and Smarties as blood cells. The researchers evaluated the use of visual metaphors (and those used in discourse) in teaching and gathered data on student perceptions using surveys. The population size of the cohort was 88 students, although the published research does not make it clear how many participated in the study. Participants were asked to rate their understanding based on the use of the visual metaphors, a relatively weak technique for establishing perception (Wellington, 2015). The study also involved some metaphor generation activities by participants which, when they were asked to discuss their use, resulted in very mixed responses; some participants regarded the activity as unsuitable for a university learning environment, while others enjoyed the playful aspect it brought to the study. The conclusion reached was that the use of visual metaphors had a generally positive impact on students' ability to understand complex material and to recall information. However, the researchers acknowledge that teachers should choose appropriate metaphors to avoid misunderstandings, but do not indicate how this choice should be made or what 'appropriate' constitutes.

Pitcher (2014) investigated how metaphor could be used to gain an understanding of complex electronic concepts. In what he describes as an *ethnographic study* he conducted formal and informal interviews with novice learners and experienced academics (people with differing levels of expertise) and drew upon his own experiences as a teacher in HE. The published study does not make it clear how many participants were involved. Pitcher concluded that visual metaphors helped them learn about concepts, particularly when new concepts were introduced, although the metaphors were subsequently forgotten. He suggests that further research into what

types of visual metaphor are most impactful and how culture affects the suitability of metaphors would be valuable to educators.

Research has also investigated how students might create and use a visual metaphor. A study by Osgerby et al. (2018) investigated how useful imagery and visual metaphors might be to undergraduate and postgraduate accounting and business students undertaking personal development planning. They concluded that the use of visual metaphors positively impacted student engagement. Of the 71 participants, 49% agreed that they found it easy to create a representative visual metaphor, while 60% agreed that using visual metaphors helped to make the creation of their plan easier. Davey and Lumsden (2010) also investigated the efficacy of using visual metaphors to construct personal development plans in the context of students in higher education. They concluded that student perceptions of its use were broadly positive. Johnson (2001) examined the value of allowing trainee teachers to generate reflections on their practice using visual metaphors; the teachers preferred to use visual metaphors rather than text. Corni et al. (2019) investigated how visual metaphors could be used in the training of physics teachers. They used visual metaphors to represent subject-based phenomena presented as part of a Physics course for primary level trainee teachers. While they concluded that the process was possible, they did not evaluate its effectiveness.

Several studies have been undertaken to investigate the power and effectiveness of visual metaphors in advertising (e.g., Jeong, 2008; Phillips & McQuarrie, 2004; Van Mulken et al., 2014). The research conducted by Petridis and Chiltern (2019) is interesting because it attempted to assess how easy it was for people to *interpret* visual metaphors in advertisements where text was absent or minimal. Most of the metaphors they used in their research involved juxtaposing two images. They concluded that people could accurately interpret the intended message on just over 41% of occasions. This indicates that even without any supplementary explanation, people may be capable of decoding the meaning of visual metaphors.

2.14 Incompleteness in the Existing Literature

Metaphors and visual metaphors have the potential to be useful pedagogical tools and may be valuable components of effective instructional design. When the material is challenging or concepts are abstract, communicating through visual metaphors may be far more effective than text and spoken word (Eppler, 2006). The existing findings from the research support this conclusion. However, the existing literature has weaknesses that expose gaps in the current body of knowledge. These gaps are perhaps better expressed more modestly, and respectfully to the field, as an *incompleteness* in the literature (Locke & Golden-Biddle, 1997; Golden-Biddle & Locke, 2007) that shows more needs to be done (Thomson, 2023b). My thesis makes the claim "that the extant literature is not fully finished; it seeks to contribute by specifying and filling in what is not finished" (Golden-Biddle & Locke, 2007, p. 38). The places where the current literature is incomplete are summarised below.

Only four studies have been conducted to investigate the use of visual metaphors as a teaching tool, with the bulk of the existing literature focused on metaphors in discourse. Three were based on teaching in the scientific domain, with one located in the context of business teaching but with a focus on the storytelling function of images. None of the studies considered the teaching of international students or were specifically set in the context of university lectures. Data collection in these studies was heavily reliant on surveys, arguably a weak method of gaining insights into participant perceptions of teaching (Wellington, 2015). More importantly, previous research has not investigated what types of images are most impactful as visual metaphors; in the research described above, the researchers have chosen the images and have not allowed participants to evaluate the choices or have an input in making the choices. Finally, no research has been conducted using an AR methodology.

2.15 Conclusion

This chapter has discussed a range of contextual issues, theories, and concepts. Discussions of my research approach and findings use the language and terminology that characterises the material included in this chapter, contributing to the credibility of the work (McNiff & Whitehead, 2009). The primary teaching mode I am interested in improving is the lecture, a mode that - although much derided as boring and ineffective - seems unlikely to be abandoned given its facility for scaling and its economic advantages to HE institutions. Its validity as a teaching method remains supported by many practitioners and institutions. My research has involved evaluating the use of visual metaphors, principally in the context of lectures. This chapter has summarised the theoretical framework that explains the use of metaphors. I have also summarised the key elements of academic literature that support and explain the potential weaknesses of using metaphors and visual metaphors in teaching.

The limited literature relating to the impact and impactfulness of images and the few studies that have considered visual metaphor in the context of teaching have been evaluated, exposing the incompleteness of the current body of knowledge. The chapter closes with an explanation of where this incompleteness lies; there has been no research into what determines the effectiveness of a visual metaphor and no research into the use of visual metaphors to communicate abstract concepts to international students. There has also yet to be a study that takes an action research approach to work with students to explore the types of visual metaphors most effective for communication purposes in the context of lectures. When developing my research questions and formulating my research design, my efforts have been directed towards adding to the existing body of work.

Chapter 3: Methodology and Methods

3.1 Introduction

This chapter describes the aims of the research and the questions that it has attempted to answer. It explains and justifies why I have chosen a pedagogical AR approach and how I have used it to answer my research questions. The chapter describes the AR model I chose to adapt and use and provides a detailed overview of how the study was validated. Each of the research methods I employed are described, justified, and evaluated and my choice of and approach to *thematic analysis* (TA) is justified and explained. Finally, the chapter explains how I have attempted to ethically undertake what could have been a very invasive and disruptive research process.

3.2 The Aims of the Research

The study had three aims which formed the overarching intentions (Agee, 2009) of the inquiry. The first two aims reflect purposes of AR described by Kemmis (2009), namely, to better understand my practice, and to find ways to improve (or as I prefer to enhance) my practice. The aims of the study were:

1. To better understand my professional practice in relation to my international postgraduate management students' experience of lectures.
2. To enhance my professional practice and my students' experience of and learning in lectures, based on this understanding.
3. To disseminate my findings and recommendations to those who teach in similar, challenging, teaching contexts to determine the value of the changes to my practice and their contribution to knowledge generation.

3.3 The Research Questions

The process of "developing research questions can give shape and direction to a study in ways that are often underestimated" (Agee, 2009, p. 431). Through many iterations, my research questions (RQs) have been reshaped to sharpen the focus of my inquiry and helped create better coherence. The order in which the questions are placed reflects the way in which the research developed; the logic to this order is explained below.

Agee (2009) argues that it is essential that the context in which the research questions are placed should be explicitly stated. The students referred to in the following research questions were international postgraduate students undertaking an introductory course in management at a Russell Group university. Most of these students were from China.[7]

RQ1: How can I work with my international postgraduate management students to better understand their learning experiences and so enhance my practice of selecting and using visual metaphors in lectures?

RQ2: To what extent can the choice and use of visual metaphors communicate the meaning of abstract concepts to international postgraduate management students, enhancing their learning experience from lectures?

RQ3: How might understanding the communicative value of visual metaphors help to enhance professional practice and the student experience of HE?

RQ1 is primarily related to the methodology, research design and research methods I have used. The question is placed first as it was essential to gain a better understanding of the types of data needed to answer the subsequent two questions

[7] A detailed summary of the research participants, with a justification for the sample is provided in section 3.10.

(Richards, 2005). Over the research cycles, finding ways for participants to articulate their thoughts was challenging. In answering RQ1, I have attempted to explain efforts to address and overcome this challenge and evaluate the extent to which I have been successful.

By answering RQ2, I addressed the issue of whether using visual metaphors to support the communication of abstract concepts in lectures is effective. In doing so, I have explored how their use in instructional design shapes the learning experience, but more importantly, when and how their use is effective or ineffective.

As a practitioner-researcher, I know that generalising research findings is potentially dangerous (Tracy, 2010). However, RQ3 has steadily grown in stature as I have exposed and presented my findings to others. My research has found resonance with other practitioners in a range of contexts, enabling me to defend the validity of my work and create a model to support the construction of effective visual metaphors.

3.4.1 What is Action Research?

McAteer (2013) emphasises the importance of methodology as it is concerned with the principles that underpin epistemology and knowledge construction. Ultimately, the choice of methodology largely determines *how* new knowledge is created through research. AR is regarded as a distinct methodology as "it is a way of understanding and generating knowledge about the complexities of practice" (McAteer, 2013, p. 21).

Bendtsen et al. (2021) assert that the common feature of all AR in an educational context is that, whether conducted by individuals or groups, it strives to find ways of improving practice and generating knowledge through a process of reflection. The methodology can be distinguished from other forms of practitioner research as it involves not only critical reflection but also the research moving through an ongoing, evolving, and iterative process (McAteer, 2013). Teachers, particularly those with many years of experience, often have firm ideas about what is effective or ineffective

in terms of practice and may have reached a point of inertia in their professional development; the process of structured research and reflection enables and promotes transformation to take place in an educational setting (Creswell, 2002). In an educational context, AR involves teachers adopting a systematic approach to exploring a situation or problem and initiating change (Basit, 2010), sustaining the research most commonly through a study of a particular aspect of pedagogy (Allen et al., 1993). The action itself is thus an integral feature of the AR process, with practitioners taking action and then evaluating and reflecting upon it (Newby, 2014).

Educational AR, therefore, involves teachers, as insiders, trying to improve their practice (Elliott, 1991; Hammersley, 2007; Newton Suter, 2011) rather than relying on expert researchers from outside their classroom or institution acting as professional advisors (Cochran-Smith & Lytle, 2009; Coe et al., 2017). The focus of AR is not generally on providing descriptions but on providing practical and workable solutions and improvements in quality (Hine, 2013; Reason & Bradbury, 2001). For some, including myself, the concept of *improvement* is problematic. McDonagh et al. (2022) prefer the term *enhancement*, arguing that improvement implies that a positivist, quantitative approach is needed to confirm that an outcome is as stated. Measuring improvement in my teaching would have been difficult to confidently and realistically do. However, understanding that my actions have enhanced my professional practice, and my students' learning experience has been possible.

3.4.2 My Approach to Action Research

In line with Kemmis' (2009) view of what AR aims to achieve, my research has sought to enhance my professional practice and the outcomes from it; I have conducted an inquiry into how my practice could be enhanced by implementing changes to my instructional design. The form of AR that I have used is *pedagogical action research*, described by Norton (2009) as AR that "Involves using a reflective lens through which to look at a pedagogical issue or problem and methodically working out a series of steps to take action to deal with that issue" (p. 1).

Participatory action research (PAR) involves partnering with participants by making them co-researchers who can help to shape the research (Brydon-Miller & Maguire, 2009). PAR aims to democratise knowledge creation, often with ambitious goals based on the researcher sharing the power and responsibility for knowledge creation with the participants (Mccaleb, 1997), or as Dedding et al. (2021) explain, “One of the core values of PAR is that knowledge is co-produced with a community; people working together to examine a problem with the goal of addressing it for the better” (p. 20). Some argue that PAR also involves participants in setting the research questions (Agee, 2009).

As will be seen in Chapter 4, my participants' input was insufficient to call my entire research project one of PAR. However, I contend that Chinese learners in western universities are an example of a marginalised and under-represented group (McLeod, 2011), so giving voice to them is desirable and means that there are *elements* of PAR in my research. For example, I made it clear to the participants that I wanted and valued their input into my research and expressed my desire to shape the form and content of my lectures using their help. Also, in the final cycle, participants moved through a guided process of image selection. Nevertheless, these features need to be more substantial to label the research as PAR, if not simply because *I* have determined the direction of the research and not my participants.

3.4.3 Justification for Using Action Research

BERA, which advocates a more practical approach to educational research, has given a boost to the legitimacy of AR, and recognised the value of the contributions made by teacher practitioner-researchers (Wyse, 2020). In their report on the landscape of educational research, Oancea et al. (2021) note that curriculum delivery is an example of where there are gaps in current research. This indicates that AR researchers have the potential to make significant, original, and worthwhile contributions to new knowledge through their work, despite the continuing challenges faced by many to gain approval and recognition for their work (Davis, 2022).

Those directly involved in providing education are best suited to find ways of making realistic and impactful improvements (Seider & Lemma, 2004; Somekh & Lewin, 2011). Bruck et al. (2001) assert that it is the very proximity that teachers have to where learning occurs that makes AR such a valuable and potentially powerful methodology.

Learners themselves may gain from being participants in AR. Arnold and Norton (2018) argue that student involvement in AR projects in HE can result in them having "a deeper, more engaging learning experience" (p. 11). They further add that collaborating with research staff, both formally and informally, can mean that "the relationships between parties shift and students can feel that their views are valued and appreciated" (Arnold & Norton, 2018, p. 11). A 2017 literature review of AR in HE concluded that when teaching and learning strategies were viewed as a reciprocal arrangement between student and teacher, the quality of the learning environment improved (Gibbs et al., 2017). Making students partners in research can help to motivate them, increase commitment to learning, and encourage greater responsibility (Bovill et al., 2011); in this study many of my students, as participants, seemed to have gained valuable insights into the research process.

The data generated from educational research is, to use Ackoff's (1999) term, "messy" (p.20), and research based on practice is rarely linear or neat (Cook, 2009). Action researchers are willing to engage with the inevitable chaos and uncertainty when collecting data about real people in complex and dynamic situations. They are also willing to admit to being wrong (Brydon-Miller et al., 2003) and accept that the research process may involve uncovering and navigating "uncomfortable truths" (Boyle et al., 2022, p. 3). My research took place in a complex situation, in a turbulent context (during the COVID-19 pandemic), and produced conclusions, not all of which are clear; these are all accepted features of AR.

Although the primary focus has been on enhancing my own professional practice, I hope that by ensuring a high level of validity in my research and by making effective use of theory, there is scope for what Bassey (2001) refers to as "fuzzy prediction" (p.

9); my work may provide *indications* for how enhancements in practice can be made by practitioners working in a similar context to me and may resonate with them (Tracy, 2010). AR can effectively "contribute to a theoretical knowledge base to advance the scholarship of teaching and learning" (Arnold & Norton, 2018, p. 5). Resonance is discussed in section 3.15.

A final justification for using AR is that there is a clear need for academics to focus on finding ways to improve the methods we use to teach international students. The increasing heterogeneity of the student body suggests that more should be done to create greater inclusivity in HE teaching (Norton, 2009). In my institution, there are concerns, some of which are openly expressed at a strategic level, that international students should be acknowledged as having immense financial value to the university and that there is a need to develop supportive and inclusive pedagogy. With lectures being a fundamental way course delivery takes place, pedagogical techniques that enhance the learning experience of international students in this setting should be welcomed.

3.4.4 My Chosen Action research Model

There are numerous models of AR, but a common feature is that they are represented as a staged or phased process and include actions that inform each subsequent stage of the research (Mills, 2000). Most models represent the process as some form of an interacting spiral, such as that described by Stringer (2007).

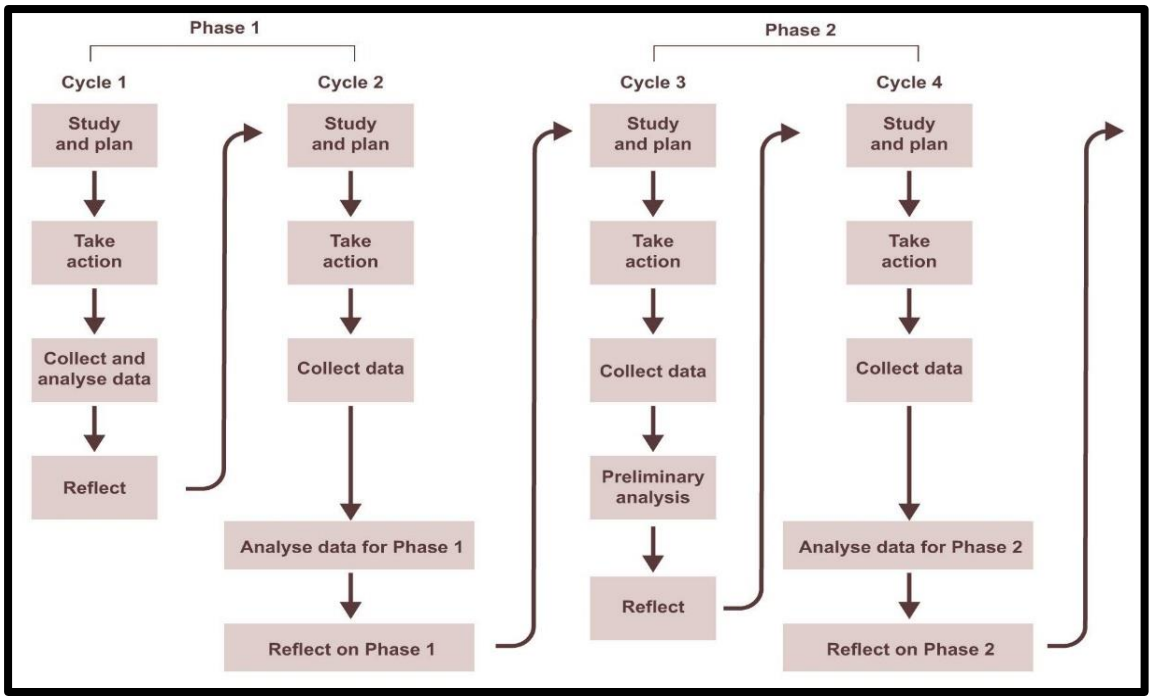
I adapted the model provided by Riel (Riel, 2019; Rowell et al., 2016) to provide the structure for my research design. This model is based on progressive problem-solving focused on the continuous improvement of practice, with each cycle being based on planning, taking action, collecting evidence, and reflecting. The model also fits my approach to developing data collection methods. The original model was based on cycles composed of: study/plan, take action, collect and analyse evidence, and

reflection. I have used a two-phase approach where each phase is composed of two cycles. My adaptation of the model is shown in Figure 3.

Figure 3 shows that the four cycles were not entirely distinct and separate as in the original model (Rowell et al., 2016). The most crucial difference between the original model and this adapted model was the analysis of the Phase 2 data at the end of Cycles 3 and 4. There were some changes to the materials used in teaching and the data collection methods, prompted by some preliminary analysis and reflections. However, I decided to analyse the data collected across the entire Phase. This approach helped generate valuable findings and deep insights.

Figure 3

My Action Research Model



Note. The principles of this model are based on the structure described and presented in *Understanding Collaborative Action Research*, by M. M. Riel, 2019, p. 2 (http://base.socioeco.org/docs/center_for_collaborative_action_research.pdf.

Centre for Collaborative Action Research.

3.5 Ensuring Quality: Validating the Study

3.5.1 How I validated my Action Research

Validity is usually identified as the principal tool for evaluating, or defending, the quality and trustworthiness of research (Heikkinen et al., 2007; Kumar, 2018). For research to demonstrate validity, the data collected, and the methods used to collect it should accurately reflect what they were expected and designed to measure (Kumar, 2018; McAteer, 2013).

It is generally agreed that judging the quality of AR requires the use of measures and perspectives that are appropriate for this particular research methodology, rather than relying on indicators more appropriate for evaluating positivist studies (Heikkinen et al., 2012). Newton and Burgess (2008) assert that insufficient attention has been given to the concept of validity in the context of AR and that this has compromised the perceived rigour of the methodology. It must be recognised that no research can be *completely* valid as it is impossible to remove all the ways in which validity is threatened; however, these threats can be minimised, and if they are not, the quality of the research may be low, and its trustworthiness and credibility poor (Basit, 2010).

Newton and Burgess (2008) argue that each type of AR project may require a distinct approach to validation. They use categorisations presented by Anderson and Herr (1999) to emphasise the importance of distinguishing between *primary* and *secondary* validities. Primary validities demonstrate the extent to which the aims of the research have been achieved, while secondary validities "ensure that the research project falls within the domain of educational action research" (Newton & Burgess, 2008, p.26). My pedagogical AR intended to generate new knowledge, as demonstrated by the stated third aim of the project (see section 3.2). As such, following the advice of Newton and Burgess (2008), the most important primary validities of my study are *outcome* and *process*, while the most important secondary validities are *democratic* and *catalytic*. To some extent, each of these four validities has been achieved. However, the overarching *dialogic validity* (Anderson & Herr, 1999) has been of fundamental

importance to strengthening the trustworthiness of the work and is discussed in detail in section 3.5.2. As Newton and Burgess (2008) assert, dialogic validity "is central to assessing the goodness of the research and in disseminating the knowledge generating from such action research projects" (p. 26). The meaning of each of these validities, and how they have been employed to strengthen and defend the value and quality of my research is explained below:

1. *Outcome validity* is the extent to which the outcomes of the research successfully answer the research questions and result in changes in practice that address the reasons for the research being undertaken. To be valid, the data generated should be of sufficient quantity and quality to provide answers to the research questions (Heikkinen et al., 2012) and show that the research aims have been met (Bradbury et al., 2019). This is effectively what Denzin and Lincoln (1998) refer to as *internal validity* and is reflected in the research conclusions and findings being plausibly and sufficiently defended and supported by the research data (Basit, 2010). Section 7.2 provides an explanation of how each of the research questions was answered.

2. *Process validity* is the efficacy of the research process to produce sufficient evidence to answer the research questions (Baumfield et al., 2012). This criterion involves demonstrating that the research was well-designed and that it was conducted in a purposeful and structured way. The research design is described in section 3.7, with a clear focus on how the valuable resource of time (Vaughan et al., 2019) was managed to ensure that the project could be completed. For example, the focus groups and interviews were scheduled to coincide with tutorials.

3. *Democratic validity* is the extent to which the research was undertaken in collaboration with those who have a stake in the issues under investigation (Heikkinen et al., 2012). The nature of AR means that others are always involved (for example, participants and colleagues), and these stakeholders should, where possible, be consulted and their views reflected in the claims

made. Tempering any claims I can make here (see section 3.4,2), I have strived to share my participants' voices and involve them in the *action* process, for example, by asking them to select images to substitute for ones that seemed to be ineffective as visual metaphors (see, in particular, section 5.2.5 on the process of phased narrowing).

4. *Catalytic validity* is the extent to which the research can contribute towards transformation on the part of the participants. Heikkinen et al. (2007) use the term *"*principle of workability" (p. 9) to describe this and emphasise that validity would be reflected in the utility or usable value of the research findings. One of the aims of this research was to enhance the quality of my practice. In quantitative research, a natural extension is to assess how far the research results are generalisable and can thus show external validity (Basit, 2010). I assert that my research and findings have found resonance with other practitioners (a distinction explained in section 3.15), an assertion illustrated through the examples provided as part of dialogic validity.

   Catalytic validity has been demonstrated by ensuring that the voices of my participants have been heard in this thesis. In chapter 4 and, especially in chapter 5, quotations from participants have been included in the text. These quotations help illustrate and explain arguments, but also serve to show examples of when, and how, participants regarded the use of visual metaphors as making a valuable contribution to their learning experience.

   Catalytic validity has also been achieved by exposing my findings to the participants, and providing them with the opportunity to give feedback on my claims. To enable participants to provide feedback, I shared a summary of the model of effective visual metaphor (as summarised in section 6.3) with Cycle 4 participants. Participants were then invited to make contributions through a Google Form, in which I asked participants if there was anything that they had disagreed with. Ten participants provided constructive and critical feedback.

Examples of how quotations from this feedback have been used can be found under Themes 2, 3, 4 and 5 in Chapter 5 and in sections 5.4 and 7.5.

5. *Dialogic validity* is how the research has been subject to peer review through critical and reflective dialogue with other researchers or informed stakeholders (Heikkinen et al., 2012). There is always danger when those who conduct research take responsibility for evaluating its quality and validity, as their vested interest may mean that they exaggerate its strengths and play down its weaknesses (Scull, 2022). To counter this weakness, McAteer (2013) suggests that the results of AR work "should be subjected to the discussion and debate of scholars and practitioners in the field" (p. 24).

3.5.2 The Importance of Dialogic Validity to this Study

While each of the validities described in section 3.5.1 were germane to my research, it is dialogic validity that has the most significant relevance. Arnold and Norton (2018) argue that one of the perceived weaknesses of AR is that the methods used may seem "amateurish" (p. 6). To tackle this potential shortcoming, they suggest opening up the research to peer scrutiny and "that the methods we choose are transparent, robust, and that we link our research to theoretical understandings at the core of learning and teaching" (Arnold & Norton, 2018, p. 6). The process of successfully moving through the competitive peer review process for conferences and publications, and the subsequent scrutiny from delegates at the former, should indicate that the work has been recognised as having merit and is sufficiently trustworthy to share with other scholars and practitioners. My work has also been validated by members of the AR community. Peer scrutiny, and thus dialogic validity, has been achieved through:

1. Writing a blog for Advance HE explaining how I have worked to overcome metacognitive obstacles in my research (Cotterill, 2022a). Thomson and Kamler (2016) argue that blogging can help a researcher to create a sense of academic identity and credibility. Because the blog was publicised at the UNE,

it stimulated some informal communications with other practitioners in the institution, primarily those interested in seeking better ways to collect qualitative data from international students about their learning experiences.[8] A lecturer in applied management at a New Zealand university had read the blog and emailed to describe his interest in my findings, although these were only briefly covered in the post. He wrote, “I'm interested in using your visual metaphors in class and get feedback from the students on effectiveness as a learning tool” offering catalytic validation that he was enthusiastic about using the techniques I had described to enhance his teaching.

2. Producing a peer-reviewed paper published in the Cambridge Educational Research Journal evaluating the principal data collection method used in Phase 2, process interviews (Cotterill, 2022b). A peer reviewer of the paper stated in their feedback that “We believe that this article has the potential to contribute to the field of educational psychology by providing insight into how students think about their learning and utilises strong research methods”, while another reviewer explained that a particular strength of the approach is that it is “culturally sensitive”.

3. Producing a peer-reviewed paper that is to be published in the forthcoming edition of the UNE’s teaching and learning journal. This paper provides an accessible summary of my findings and recommendations for practitioners in relation to how to use visual metaphors in their instructional materials. One peer reviewer summarised the paper as “excellent and a very interesting read” while another described how the:

   Exploration of visual metaphors, a concept often overlooked in our everyday teaching materials, encourages readers to be more mindful of the impact such imagery can have on learners and offers practical suggestions for how they can implement this in their teaching. In addition to the fascinating subject matter,

[8] For example, I had a discussion with a lecturer at the UNE who had responsibility for a postgraduate course in music. She described the difficulties she had gaining meaningful feedback on teaching quality from international students and was interested in my thoughts on how such data might be collected.

the article is very well-written: it is solidly grounded in the academic literature, whilst presented in an engaging style suitable for a highly educated, yet non-specialist, readership. I am looking forward to seeing how readers respond to it when the issue is published.

4. The use *validation* groups, as suggested by McNiff (2017). She proposes that researchers should create a group to provide scrutiny *throughout* the research process by giving feedback, questioning, offering critique and, perhaps most importantly, confirming that claims made by the researcher seem to be substantiated by the evidence collected. I have been lucky enough to have a group of six academic associates who have performed this role. My validation group was composed of: a media art producer, an author of history textbooks, a reviewer of doctoral proposals, an English for academic practice tutor, a Chinese university lecturer and an educational research supervisor. This blend of knowledge, skills and expertise has proved extremely useful, with this group acting as "critical friends" (McNiff & Whitehead, 2009, p. 61). They have suggested improvements in the design of research instruments and assisted with judgement calls related to subjective choices, for example, when selecting images or deciding what material should be retained or discarded from this thesis and ensuring that the wording of questions in research instruments is at an appropriately accessible level. My validation group has added a valuable feature to my AR by providing "critical feedback about possible modifications" (McNiff & Whitehead, 2009, p. 25), ultimately strengthening the work's validity and quality, but also my ability to collect meaningful data.[9]

5. Presenting details of my research methods and findings at six conferences and symposia (see Appendix 3).[10] The scrutiny and questioning by delegates through (mainly informal and unwritten) dialogue have been a way to ensure that weaknesses in my research have been uncovered and addressed (Hill et

[9] The validation group also provided an informal means to further publicise my work. Through members of the group I have, for example, been invited to deliver a training session on the use of visual metaphors to a group of PGCE students, and to deliver a workshop as part of a secondary school's training day.
[10] At the time of writing a further symposium at Exeter University is yet to take place.

al., 2022). There has been a healthy exposure to external critique. Preparing for conferences has also assisted with helping to logically sequence my arguments, a benefit of conference preparation described by Jensen (2017).

A delegate at the Advance HE symposium, at which I explained my research methods, contacted me to say that the “Presentation was super interesting, really engaging and just a fascinating research topic”. Another delegate at the symposium invited me to run a workshop for one of their university’s teaching and learning group meetings, explaining that they believed that my ideas would be received well by staff actively seeking ways to enhance their practice.

An action researcher and secondary school teacher who attended my CARN presentation commented that “Richard's presentation, anchored in engaging examples, struck the balance many of us aim for in action research between meaningful experience and a rigorous theoretical framing”. Another delegate at this conference, who trains primary teachers, contacted me to explain how my ideas resonated with her and how they might be incorporated into her work:

Richard's presentation was very insightful and really made me think about the powerful impact and affect that visual metaphors can have upon the ways in which we think, communicate and understand. I believe that his use of visual metaphors with his students really enabled them to explore the hidden meaning of abstract concepts and to further their understanding of these. I believe this is a really effective way of supporting and also extending students' learning and will definitely be trying this out with my own student teachers in primary education to help them explore metaphors linked to teaching and learning and education. Thank you Richard.

An action researcher and primary school teacher who also attended my CARN 2022 presentation explained how my ideas mirrored approaches she takes to teaching:

Richard used many examples of the same visual metaphors he had employed with his students illustrating the impact of such an intervention, the topic of his

talk. The findings were clear and well structured and prompted fruitful conversation amongst the other conference participants. As a primary-school educator, I find metaphors quite an accessible way to engage with children, so it was fascinating to hear that translated to a higher-ed setting with a large EAL population.

After the ARNA 2022 conference Dr Margaret Riel, whose model I adapted for my AR, wrote of my workshop, “I loved the interactive components of the work and also the focus on metaphoric language. I am a strong fan of George Lakoff and his books had a very strong effect on my thinking”. Dr Joel Judd, the organiser of the ARNA conference, also attended my workshop and wrote, “Thank you again for presenting at ARNA. I was glad to get to sit in on your session. I think your work touches on cognition, language learning, and literacy skills, to name three” and alluded to my use of metaphor elicitation: “Some of what you did reminded me of my ESOL days. Pictures were indispensable, especially for abstract concepts. I didn't think to have students bring in their *own* pictures. That would have been a great way to engage them in conversation!”. An action researcher who conducts AR in secondary education reflected on the ARNA workshop in his correspondence with me:

The presentation was both thought provoking and informative as it made me question my approach as a former teacher. The use of metaphors in conjunction with pictures seems such a simple idea as we know that both can be powerful but together seems to be a game changer. As a visual learner it also made me question why the use of metaphors enhances the use of pictures and your explanations around cognition certainly make sense. The fact that you enabled the foreign language students to complete work such as this in their own language also improves and enhances the learning process. I am interested to see where this will take you next as I do believe that this work would also be applicable to secondary education.

The importance of culture (an issue discussed under Theme 5 in Chapter 5) was acknowledged by an academic undertaking research into culture who watched my presentation at the Oxford Brookes colloquium and commented, “I

found this really interesting. I was particularly interested in the angle of cultural significance with visual metaphors, particularly as my own professional practice falls mainly within a cultural context that I am familiar with". A nursing lecturer, who was also a delegate at this event, explained how visual metaphors might cut across cultures and as such be an extremely useful feature of instructional design: "Thank you Richard for this really interesting presentation. I lecture to large numbers of student nurses across many different cultures so images can be a really powerful way of communicating ideas". Another delegate at this event, a lecturer in business, contacted me to say, "I teach marketing in the Business School at Brookes, so this is of interest to me too - we have a lot of international students that struggle to understand complex ideas, so I may be using this now! Thank you!".

I was invited to speak about my research methods at a University of Exeter symposium on the *International Student Experience*. One of the organisers explained how they had found the paper I had written on process interviews and how to use them (Cotterill, 2022b) "extremely interesting and informative" and that they "believe the principles of this project could help enhance our practice at the University of Exeter, and beyond (the event is open to all). It would be great if you could share your research".

The context in which my teaching and research has been conducted has obviously been quite specific. As such, I had originally not expected the project to resonate much further than with other practitioners who are either researching the same types of issues as me or working with the same type of students. However, it has been clear from the feedback and communication described above that the model resonates with practitioners in a wide range of educational contexts.[11]

[11] The slides used for the CARN 2022 conference are shown in Appendix 37. These slides were selected as this presentation explained my methods and findings. Besides examples of visual metaphors used in my teaching and research, the slides also use visual metaphors to help communicate my ideas. For example, an image of oranges being picked from a tree illustrates the data collection process.

The use of dialogic validity has been fundamental to strengthening the quality and trustworthiness of my research, my findings, and the content and presentation of this thesis. The process of preparing to present my work to others, both in spoken and written form, has helped to structure and order my arguments in a clearer and more logical way. Critical feedback from "knowledgeable professionals" (Powell, 2020, p. 13) has helped to "establish the legitimacy and validity of [my] knowledge" (Kemmis et al., 2014a, p. 3). Dialogic validity has helped to provide reassurance that my work is relevant and of value; it has also helped to shape the direction and form of the inquiry, and the way in which this thesis has been structured and presented.

3.6 Ethics

3.6.1 The Importance of Ethics

Agee (2009) argues that "inquiries into other people's lives are *always* an exercise in ethics" (p. 440). She contends that ethics are so important that consideration for them should run through an entire research inquiry, including the design of research questions. Furthermore, having a rigorous approach to ethics may contribute to the validity of the research (Heikkinen, 2007) and may offer fresh perspectives on the research design (Sikes & Piper, 2010). I have been acutely aware that my research has intervened in, and overlapped with, the pedagogical experience of my students. Many have been enthusiastic and valuable participants in my research. Beyond the ethical issues discussed below, I have felt a responsibility to ensure that anything they have agreed to do or participate in has not negatively impacted their learning.

3.6.2 Informed Consent

It was essential to ensure that my research participants were truly providing informed consent (BERA, 2018). An important feature of informed consent (the *informed* part) is ensuring that participants have clear information about what the research involves (Piper & Simons, 2011), why the research is being conducted, the level of anonymity

provided, and what will happen to the contributions they make (Wiles, 2012). With young participants consent is a complex and opaque phenomenon (Harcourt & Conroy, 2011) that needs communicating in a way that has meaning to them. As Newby (2014) explains, consent should be more than simply obtaining a signature indicating an agreement to participate; participants need to understand the research aims fully and on what basis they are participating. The basis for participating would include what might happen to the data they contribute; for example, I needed my participants to know that data may be used in my thesis or as part of conference presentations or publications.

In Phase 1, I translated the participant information sheet (see Appendix 4) into Mandarin (the first language of most of my participants), had this checked by a Chinese colleague, and emailed a copy to my students in advance of asking them for informed consent and the commencement of any data collection activities. However, participants clarified that this was unnecessary as their browsers were set up to translate English text instantly. A general consent form was completed by participants in Phase 1 (see Appendix 5) with a further consent statement built into the questionnaires.

Before each focus group in Phase 1, I reiterated, particularly strongly with online sessions where misunderstandings might be more likely (Gray et al., 2020), that participation was entirely voluntary. I also explained the aims of my research and asked for any questions. From my experience working with international students, I know that they are overwhelmed with documents to read and that if I want to be confident that a message has been communicated to them, a personal explanation is often the most effective.

In Phase 2, with my supervisors' agreement, I decided to ask for consent at the start of the course. I achieved this using a Google Form (see Appendix 6). Through this form, students were asked to consent to participate in each part of the research (surveys, interviews and classroom activities) and invited to ask any questions they might have about the research. However, before the surveys, interviews, and phased

narrowing exercise, I re-emphasised the voluntary nature of agreeing to participate. I invited questions about this at every stage to ensure that my perception of the consent process and that of my participants aligned, an essential feature of ethical research (Van den Hoonaard & Van den Hoonaard, 2016). As Fox et al. (2017) warn, when consent is embedded in an early part of a course, participants may feel later that it has been hidden. The repeated reminders hopefully meant that this was not the case with my research.

I also obtained institutional consent from the UNE (a blank centre approval form is in Appendix 7). This was signed by my departmental director confirming that he granted permission for me to undertake research. At the time, no research ethics committee existed, and this was the official procedure for obtaining permission to conduct research.

3.6.3 Confidentiality and Anonymity

BERA (2018) emphasises that confidentiality and anonymity should be the norm in research. Maintaining confidentiality necessitates any identifiable information relating to individual participants not being disclosed; a way to operationalise this is to provide participant anonymity (Wiles et al., 2008). Any data presented in my thesis must not disclose, directly or indirectly, the identities of the participants who provided it. Anonymity was also extended to my University (Plowright, 2011), referred to as the UNE, throughout this thesis. However, as Floyd and Arthur (2012) assert, providing complete anonymity to my institution is effectively impossible, given that my identity as the researcher is not protected and cannot be anonymous.

In Cycles 2, 3, and 4, I have used quotations from the collected data to support the analytical text. Although some have argued that the use of pseudonyms (including those chosen by participants themselves) can add a functional qualitative layer to a transcript, such as a name associated with a particular gender (Allen & Wiles, 2016), I did not feel that this would add any value to my ability to analyse or report upon the

data collected. The anonymity of contributions to interviews was protected by referring to a particular interview group as a code. For example, if a group had a code 3-4A, this would refer to Group 4A in Cycle 3. When quoting a participant, I have used statements such as 'a participant from Group 3-4A explained…', thus anonymising the contributor. With non-group individual contributions (such as the phased narrowing exercise), a code number was used for each participant. I numbered respondents and used this number when providing quotations. Appendix 1 provides a complete list of the codes and the data form and source with which they are associated. Extracts from transcriptions have been included in the appendices (see appendices 20 and 36), in order to demonstrate, in particular for Phase 2, how the coding and theme creation process was conducted. Participants had been assured that I would not include entire transcriptions in my thesis, but that I would only include extracts and quotations; this provided them with a further layer of reassurance about the anonymity of their contributions (Germain, 2019).

There are often practical limits to what can be achieved regarding confidentiality and anonymity (Walford, 2006). As far as possible, I have attempted to ensure my participants have remained anonymous, while still being able to locate contributions from individual participants or groups via the codes.

3.6.4 Right to Withdraw

BERA (2018) states that "Researchers should recognise the right of all participants to withdraw from the research for any or no reason, and at any time, and participants should be informed of this right" (p. 31). To facilitate this, researchers need to provide contact details to participants and make it clear if there is a time limit for requesting a withdrawal. The issue of a time limit on withdrawal was made clear at each research stage. For example, in the participant consent form for Phase 2 (see Appendix 6), the following statement was included:

> I understand that I have the right to withdraw from the research at any time without giving a reason, and the right to withdraw my data up to one month after the course has ended. Should I choose to do this, my data will not be used.

Ensuring there is a right to withdraw is not only an ethical requirement. It also strengthens the trustworthiness of the research by allowing participants who, for example, may feel that they have been coerced or fear they have been misrepresented to remove their data contributions (Schaefer & Wertheimer, 2010).

As explained above, by coding transcripts and individual contributions, I could locate any data attributable to a participant should they have decided to exercise this right. If a participant wanted to withdraw from the research and had contributed to data collected in a group, I was prepared to remove the entire group's data. Fortunately, none chose to.

3.6.5 Positionality

Newton and Burgess (2008) argue that good-quality AR should pay close attention to the welfare of the participants. They also argue that many AR projects need to give more attention to research ethics. For example, research in a school or university setting has not always clarified how issues such as maintaining anonymity, ensuring that participants are not coerced, and confidentiality have been addressed. Seal (2009) acknowledges that "in higher education, the student voice literature is relatively silent on the issue of power relationships between teachers and students" (p. 997). My position as a teacher to my participants is entwined with ensuring that my research is ethical; if poorly managed, it could result in unethical research.

As module leader and teacher, my position of authority might make students feel that they *had* to agree to be participants or that they could not withdraw. They might feel obligated to be research participants (Brinkmann, 2007). I wanted to ensure they fully understood my expectations as the researcher and their rights as participants. At every

stage of the research process, I emphasised that participation was entirely voluntary and that there would be no repercussions for withdrawing. While it is impossible to be entirely sure, I am confident that participants wanted to be part of the research. Many participants commented on how they had enjoyed being involved in the project (see section 7.5 for reflections on this).

3.7 Research Design

Braun and Clarke (2019) emphasise the importance of ensuring that research is a planned and justified activity. The module I teach is a one-term, eleven-week course delivered in the spring and summer terms. The research was undertaken over four cycles, with one cycle equating to one term's course delivery. The cycles were divided into Phase 1 (Cycles 1 and 2) and Phase 2 (Cycles 3 and 4) and are summarised in Table 1. The research has been divided into two phases to distinguish between the first two cycles, in which an exploratory approach was taken to data collection methods, and the second two cycles in which process interviews were employed with a consequent major shift in the extent and quality of data collected. I used Cycle 1 as an opportunity to pilot research instruments. This process is described in section 4.2.1. Phase 2 also involved face-to-face contact with participants, further distinguishing it from Phase 1 in which all students were being taught remotely. In week 8 of each term, the students participated in a tutorial with me to discuss progress with their group report (an assessment requirement that is responsible for 50% of the module marks). This provided an excellent opportunity to invite them to extend the tutorial and to hold focus groups or group interviews. The remaining three weeks of the module are always extremely busy, with students working on reports and preparing for a final examination; therefore, this was not a suitable period for asking them to sacrifice time to help with research.

Table 1

The Two Phases and Four Cycles of the Research

Spring 2021	Summer 2021	Spring 2022	Summer 2022
Phase 1		Phase 2	
Cycle 1	Cycle 2	Cycle 3	Cycle 4

In the academic year 2020/2021, Spring and Summer term teaching was delivered entirely online, with seminars held through Zoom. This meant that all focus groups and interviews in Phase 1 were conducted through Zoom. In Phase 2, some students opted to take the course online, while others chose to attend face-to-face lessons; half the interviews were conducted through Zoom.

Three weeks into the Spring term of 2021, the decision was made for all university lectures to be delivered asynchronously as recordings made using Panopto screencast software. For my module, each week, students were asked to watch two lectures (lectures typically lasted between 30 and 40 minutes). This meant that over the first seven weeks of the term, students were expected to watch 14 lectures.[12] In each of these, use was made of between two and eight visual metaphors. The images were used at the point an abstract concept was introduced. Sometimes the concept's name was displayed on the slide, and sometimes only the image was displayed as I introduced the concept. In both Phase 1 and Phase 2 all lectures were delivered as recordings.

[12] Panopto provides data on student engagement. For example, it shows what percentage of a lecture recording each student has viewed. As compulsory questions were embedded in the lecture recordings, students could not just allow the recording to run to the end to achieve an engagement percentage of 100. From the outset, I presented this data to the seminar classes and used it to motivate students to watch the recordings by *naming and shaming* non-engagers. This quickly proved to be a very successful strategy; not watching the recordings became embarrassing.

In Cycle 1, three research methods were used. A survey was administered in Week 4, and focus groups were held in Week 8. Semi-structured interviews were also held towards the end of this term, with Chinese students undertaking postgraduate courses in Education.

In Cycle 2, two research methods were used. A revised survey was administered in Week 4. In Week 8, focus groups were again held, but this time with a revised structure incorporating three tasks to be completed.

In Phase 2, shorter surveys were administered in Week 2. The purpose of this was to profile the cohort rather than to attempt to collect any data concerning the use of visual metaphors. *Metaphor extension exercises* were used in each seminar, along with *metaphor elicitation activities*. Process interviews replaced the focus groups, again held in Week 8, in order to capitalise on the successes of the practical elements of the focus groups and to help generate explanatory data. Following the interviews, participants were invited to provide written feedback on some of the key issues discussed. Towards the end of Cycle 4, a *phased narrowing* (Levin & Jasper, 1995) exercise was undertaken; this involved participants moving through a staged process of helping to choose and justify images to replace some of those broadly regarded as the least effective visual metaphors based on the process interviews.

Table 2 summarises the data collection methods used in each cycle. The changes made to the methods used across the cycles, demonstrates the employment of what Morse et al. (2002) term “an active analytic stance” (p. 17). The research methods are explained in section 3.9, with a detailed discussion of their use and the data they generated provided in Chapters 4 and 5.

Table 2

Summary of Data Collection Methods and Analytical Techniques

Phase	Cycle	Data collection methods	Principal analytical techniques
1	1	Survey Focus groups Semi-structured interviews	Deductive analysis Framework analysis
	2	Survey Focus groups	Thematic analysis
2	3	Survey Metaphor extension exercises Metaphor elicitation Process interviews Follow-up questions	Thematic analysis
	4	Survey Metaphor extension exercises Metaphor elicitation Process interviews Phased narrowing Feedback on model	Thematic analysis

The dominant method of analysis employed was thematic analysis (TA), chosen primarily for its suitability for application to a range of data types (Braun & Clarke, 2021b). However, analysis in Cycle 1 took a more experimental approach and used deductive analysis (Pearse, 2019) and framework analysis (Gale et al., 2013). These techniques are explained in sections 3.12 and 3.13 and their use is discussed in Chapters 4 and 5. However, it is worth noting that these data collection methods will have impacted on the data collected, and consequently my findings. TA takes a very broad and flexible approach to data analysis, whereas deductive analysis and framework analysis are largely constrained by criteria predetermined by the researcher (such as interrogative questions in the deductive analysis and column headings in the framework analysis).

As the four Cycles were moved through, I replaced some images used in the lectures. I used the replacements in exercises to compare participant responses. Examples are provided in the data analysis sections in Chapters 4 and 5.

Once the data collection for Phase 2 had been completed and analysed, I was able to generate a model of visual metaphor efficacy. To engage in dialogic validation of my research and findings (McAteer, 2013), I presented my work at six conferences (see Appendix 3).

3.8 COVID-era Research

Conventionally, research interviews and focus groups are conducted face-to-face (Creswell, 2013). With the unforeseen external threat of COVID-19, I was compelled to take all teaching and research in Phase 1 online. Thus, all the focus groups were conducted using videoconferencing (Zoom being the university's preferred platform). In Phase 2, with students being offered the choice of face-to-face or online teaching, approximately half of my participants were interviewed online.

Using videoconferencing for focus groups and interviews has advantages. For example, it is easier to reach disparate populations (Boland et al., 2021), so I could still speak to participants, even when most were in China. Videoconferencing also permits some degree of valuable non-verbal communication to continue, although the quality of this is contested (Seitz, 2016).

There remains a more significant challenge to establishing rapport with participants in an online context (Boland et al., 2021) and building a personal connection (Vallejo et al., 2022) to enable a relaxed and productive atmosphere. Although I had the advantage of a pre-existing relationship with the participants, as their teacher, not being in the same physical space as them might have limited my opportunities to read non-verbal and emotional cues (Cater, 2011).

Some have argued that online etiquette is such that trust and rapport between interview participants are implicit (Kite & Phongsavan, 2017) and may even be established quicker online than face-to-face (Deakin & Wakefield, 2014). Participants may experience a greater sense of security or comfort in an online environment, helping to improve the candour with which they contribute (Adams-Hutcheson & Longhurst, 2017) and creating what Weller (2017) terms the nurturing of a "co-presence" (p. 618). In an online environment, participants may consequently be more open and expressive (Deakin & Wakefield, 2014). The lack of physical proximity to the interviewer may explain this (Mabragaña et al., 2013), with participants feeling more comfortable expressing personal views in their own space (Gray et al., 2020).

The fact that participants were already using Zoom for seminars meant that they had a working knowledge of the platform (Boland et al., 2021), making breakout room use easy to facilitate. Like other video conferencing platforms, Zoom provides a recording and transcription feature. I was concerned that participants might experience video conferencing fatigue - defined by Vallejo et al. (2022) as "an exhaustion one feels from overusing online video conferencing" (p. 6) - but this did not seem to be a problem.

Some research has indicated that the quality of online interviews is no lower than those conducted face-to-face (Cabaroglu et al., 2010; Deakin & Wakefield, 2014) as long as the participants can clearly see the interviewer (Mabragaña et al., 2013). Boland et al. (2021) argue that videoconferencing is a viable alternative to face-to-face interviewing as long as rapport is cultivated. My students could clearly see me and rapport seemed to be relatively easy to achieve.

3.9 Research Methods

Providing an account of how data has been collected will help provide AR transparency, rigour and credibility (Heikkinen et al., 2012). The research methods I used have been changed and adapted across the two phases and four cycles. For each research method employed, I will explain its purpose in terms of the type(s) of

data I planned to collect and the justification for its choice. In doing this, I will evaluate each method, although their use is discussed in more depth in Chapters 4 and 5. Etherington (2007) emphasises the importance of being authentic in our research, choosing research methods and methodologies that resonate with us. To this end, I have remained flexible (Morse et al., 2002) and attempted to improve and enhance my research methods in the same spirit that, as an action researcher, I am attempting to improve and enhance my teaching practice.

3.9.1 Surveys

According to Basit (2010), surveys are the most commonly used research method in education. A well-structured questionnaire-based survey is an effective way to quickly and efficiently generate basic data from a large sample, enabling the researcher to begin making inferences (Basit, 2010). It should also be suitable for repeated use and therefore demonstrate a high level of reliability (Cohen et al., 2002). However, Wellington (2015) warns that a survey should be best treated as a “fact finding” (p. 101) exercise that, although in itself unlikely to contribute to the development of a theory, may help with testing or adding weight to it.

In Phase 1 I made use of a survey to collect profiling data on my participants and to gauge their impressions of my use of visual metaphors. In Phase 2, I made a decision that the surveys would be used to collect only profiling data and to seek informed consent from the participants. In line with Wellington (2015), it became apparent through Phase 1 that only basic data could be collected using surveys. Chapters 4 and 5 provide a more detailed discussion of the surveys and their use. What follows is a general summary of the principles applied to each cycle.

I constructed the questionnaires using the Qualtrics online survey tool. This produced a clear and professional layout, usable on a mobile device, which was necessary for the credibility of the research (Rowley, 2014). The Qualtrics semantic correction tool helped to enhance presentational clarity further. For analytical simplicity, the questions

were almost all multiple-choice (Creswell, 2002). To make the questions accessible, I used simple language, avoided jargon or technical language, avoided negative wording, and made the answer options as straightforward as possible (Creswell, 2002).

The administration of the surveys was simple, as the link to the Qualtrics questionnaire could be distributed through the Cohort email list. The automated processing of the collected data using this software was efficient (Basit, 2010) and made it easy to generate clear summaries.

Students are inundated with invitations to participate in surveys from their institutions. They can find the process exhausting (Porter et al., 2004), often resulting in low-quality data and a poor response rate (Adams & Umbach, 2012), so the questionnaires were kept concise. In Phase 1, the short statement asking students to consent to participate reassured them of their anonymity (Opie, 2004). In so doing, it was hoped that participants felt that they could be completely honest and be reassured that they did not need to conform to any norms or provide the answers they thought I expected or hoped for (Jedinger et al., 2018).

3.9.2 Focus Groups

Focus groups bring together a group of people to discuss a topic in a moderated setting, capitalising on group dynamics to stimulate discussion and interaction in order or generate data that individual respondents would not provide (Greenbaum, 2003; Kidd & Parshall, 2000). Focus groups can be helpful in AR when the researcher is interested in subtle factors such as attitudes, motivations, and opinions (Krueger et al., 2000). In their meta-study of research conducted through individual interviews and focus groups, Guest et al. (2017) found that focus groups were better than interviews for eliciting information on sensitive topics. For some students, being asked to discuss the quality and effectiveness of my teaching (with me) is a sensitive topic.

In Phase 1, I decided to use focus groups rather than individual or group interviews as I wanted to create a relaxed environment in which students who might be reluctant to express their views were more willing to do so (Barbour, 2008; Xerri, 2018). Through discussion, I hoped to gain an insight into whether visual metaphors were helpful to students as a means of understanding abstract concepts; the attention was placed on answering what became RQ2. I created focus group guides for each cycle to provide a loose overall structure for the discussion (Smithson, 2000). The guides included open prompts (Xerri, 2018) such as: 'Can we talk about what you think lectures are for?'. Aligned with each of these, I prepared several more specific and direct questions. The primary reason for using this structure was that, while I did not want to lose the dynamic discussion possibilities of the focus groups and did not want to drive the discussions too forcefully towards specific themes, I was concerned that linguistic and cultural factors might at times mean that the discussion stalled (Stewart & Shamdasani, 2014).

Newby (2014) argues that successful focus group discussions will not be a simple matter of pre-prepared questions being asked and answers being given. He warns that this approach will likely result in superficial research and fail to take advantage of the opportunities for interactions between participants. He also believes that while eliciting opinions from participants is possible, encouraging them to articulate *why* they have these opinions is the real challenge; this was a problem that I encountered, associated with the metacognitive problems discussed in section 1.6.4. Breen (2006) feels that an effective way to elicit explanations through a focus group is to encourage participants to compare their experiences and explore their disagreements. A secondary reason for creating some structure for the focus groups was that I planned to replicate them across groups and cycles. Some structure enabled direct comparisons and patterns to be identified and analysed (Krueger et al., 2000; Russell Bernard et al., 2016).

Almost all participants in the focus groups were from China. This participant homogeneity, in terms of language and cultural background, arguably helped to improve dynamics (Dörnyei, 2007). The homogeneity also strengthened the

subsequent analysis, as it allowed for more meaningful comparisons between groups and cycle cohorts (Barbour, 2008).

The focus groups made use of images from lecture slides. Using artefacts in this way is a technique that has been acknowledged to help generate focus group discussion (Mann, 2016b; Xerri, 2018). As the research was based on my use of these images, it was logical to make them the centre of the focus group discussions.

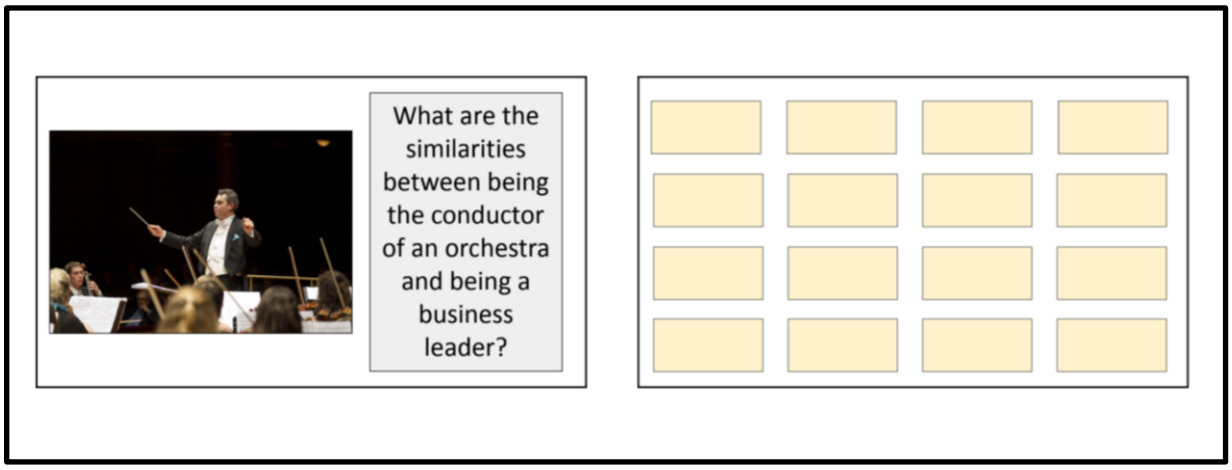
3.9.3 Metaphor Extension Exercises

Metaphor extension stretches the connection between the source and target beyond the original main comparison (Semino, 2008). If a visual metaphor was powerful, extending it would be easier, and input from participants would be more meaningful or diverse. Metaphor extension activities were designed to tease out this data and to establish whether participants could suggest characteristics of the metaphor beyond simple features.

The exercises I produced, and used in Phase 2, were based on *virtual sticky notes* using shared Google Slides. I witnessed this technique being used effectively at a learning technology online training workshop I attended at the UNE. When discussing creative research methods, Kara et al. (2021) explain how digital technologies, such as the one employed here, have the potential to collect rich data. The exercises used images taken from lectures to create simple starter activities in which students were shown the image and then asked to think of ways in which the image resembled the concept or conveyed information about it. The image was placed on one slide, along with the prompt question(s), and a second (and third if required) slide contained the virtual sticky notes. An example pair of slides are shown in Figure 4. The slides were shared with seminar groups, and students were each encouraged to make one or two contributions. There followed a class discussion about the contributions made.

Figure 4

An Example of a Metaphor Extension Exercise



Baumfield et al. (2012) discuss how useful it may be for action researchers to collect data in this way - through teaching and learning activities that enhance pedagogy while simultaneously generating research data. The metaphor extension exercises were therefore designed to fulfil more than one purpose (although were primarily used for research purposes) and did not impede or interfere with the learning process. A discussion of the use of metaphor extension exercises is provided in Chapter 5.

3.9.4 Semi-structured Interviews

A semi-structured format was used for the Cycle 1 interviews with postgraduate education students. Semi-structured interviews use guideline questions but are flexible in how they are asked, the wording used, the order in which they are asked, and the follow-up questions (Newby, 2014). The purpose is “to allow the researcher and participant the freedom through which to explore an honest and authentic account” (McAteer, 2013, p. 73). The interview thus resembles more of a conversation than an interrogation and is described by Baumbusch (2010) as a “social interaction” (p. 255). Norton (2009) describes semi-structured interviews as those that:

> Follow an interview schedule with pre-determined questions but are more flexible than a structured interview in that you use probes designed to elicit further information when necessary. The purpose of a semi-structured interview is to understand the respondent's point of view. (p. 100)

The format of semi-structured interviews is suitable for exploring each individual's feelings and perceptions (Koven, 2014) through a conversational format (Clifford et al., 2016).

Further advantages of using a semi-structured interview include the ability to clarify any misunderstandings that participants might have (Newby, 2014) and the quality and richness of the data that can be generated (DiCicco-Bloom & Crabtree, 2006; Lambert & Loiselle, 2008). Having a backbone of structure to the interviews I conducted with the postgraduate students enabled the interaction to remain focused (Ryan et al., 2009) and allowed a range of specific and predetermined topics to be explored, with some structured questions, but provided the flexibility to explain questions where necessary and to probe more deeply into pertinent or interesting issues (Roulston & Choi, 2017).

Conducting a semi-structured rather than a structured interview requires more skill, as the interviewer needs to be perceptive, knowledgeable of the context and have the confidence and flexibility to explore emerging issues (Newby, 2014). It is also vital that the flexibility afforded to the semi-structured interview does not allow the interviewer to create bias by pushing respondents to answer in a particular way (Newby, 2014). I have had many years of experience interviewing students and teachers; therefore, I was familiar with and comfortable conducting semi-structured interviews. A discussion of the semi-structured interviews with the postgraduate education students is provided in section 4.3.3.

3.9.5 Metaphor Elicitation

In Phase 2, I used a simple form of metaphor elicitation to gain an insight into the types of images my students associate with concepts used in models and frameworks that are part of the course, such as Mintzberg's roles of management (Boddy, 2017). Metaphor elicitation was initially used by Coulter and Zaltman (1994) to improve the quality and authenticity of insights from market research. The technique they outlined was a complex multistage process framed using the model known as ZMET or the Zaltman Metaphor Elicitation Technique (Zaltman & Coulter, 1995).

The central feature of metaphor elicitation is that participants select images that are brought into an interview environment and used as the focus of questioning. The images are treated as metaphors and are used to help understand participants' conscious and, more importantly, unconscious mental processes (Christensen & Olson, 2002). The unconscious element of metaphor elicitation originates in the Freudian psychology of repressed thinking (Khoo-Lattimore & Prideaux, 2013). Coulter and Zaltman (1994) assert that a deeper understanding of participants' thought processes can be achieved by asking them to select pictures which are then used as the focus of discussion through interviews. Where thoughts and behaviours are complex or difficult to articulate, metaphor elicitation may be useful to expose participants' views that might otherwise be obscured or hidden (Khoo-Lattimore & Prideaux, 2013).

Metaphor elicitation is, therefore, a potentially helpful way of gaining insight into hidden knowledge, may enable participants to embody cognition and is based on the assertion that most communication is nonverbal (Zaltman, 1997). The technique's theoretical foundations are strong, based on "cognitive neuroscience, neurobiology, art critique, semiotics, the philosophy of mind, art therapy, and psycholinguistics" (Catchings-Castello, 2000, p. 8). The insights gained through metaphor elicitation may provide rich data and a deep understanding of participants' thoughts and feelings, with the selected images forming an entry point to them (Haneberg & Aadland, 2020).

Metaphor elicitation has been used successfully in a variety of contexts. It has helped researchers gain insights into doctoral students' views on training and research culture (Piercy et al., 2005), students' views of the quality of higher education (Voss et al., 2007), opinions on unsustainable tourism (Khoo-Lattimore & Prideaux, 2013), attitudes to travel risks during the COVID-19 pandemic (Jung, 2022), school childrens' self-perceptions (Stickney, 2022), and attitudes to social responsibility amongst university students (Acuti & Sit, 2022).

The method is particularly useful when investigating complex and overlooked issues that have not previously been investigated (Catchings-Castello, 2000) making it ideal for original research. Using images found by participants in an interview enables rich and deep insights into thought processes by allowing the images to support explanation and articulation (Christensen & Olson, 2002; Zaltman & Coulter, 1995). The projective nature of metaphor elicitation and, most importantly, the fact that the participants set the agenda for discussion through their choice of images makes it a powerful psychological research tool (Khoo-Lattimore & Prideaux, 2013).

I wanted to use metaphor elicitation to gain insights into the types of images that my students would choose as visual metaphors. The images found by participants were used to stimulate discussion in the Phase 2 interviews. This helped to personalise the interviews. My use of metaphor elicitation is discussed in Chapter 5.

3.9.6 Process Interviews

Process interviews were developed in response to encountering the metacognitive issues (in Phase 1) of asking participants to talk about their learning. Conducting in-depth interviews with people unfamiliar with the terminology and conceptual ideas being investigated, especially when I was from a different culture to the participants (Harper, 2002), was challenging. Process interviews capitalise on the key strengths of the focus groups. Their structure and theoretical foundations will be explained in detail to clarify how they are worthy of recognition as a secondary contribution to knowledge.

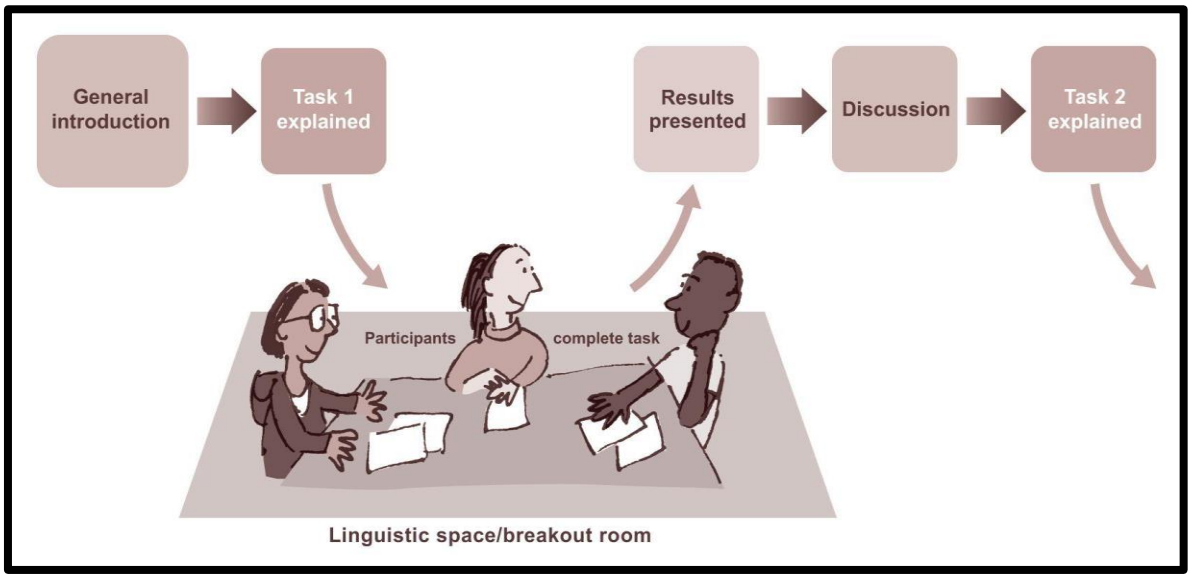
Process interviews involve punctuating a semi-structured group interview with *cognitive tasks*. Completing these tasks is designed to provide context and relevant material for questioning. In Phase 1, one of the focus groups' most productive features involved participants completing tasks. Process interviews build on these features and construct the interview discussion around their completion. While completing the tasks, participants are encouraged to speak their first language and use translation software as needed.

In section 5.2.3, there is a detailed explanation of how process interviews were used in Phase 2, including examples of tasks used. However, the basic format is depicted in Figure 5. After a general introduction to the interview in which issues such as the purpose of the research and informed consent are covered, the first task is explained. Participants are invited to complete the task and are encouraged to use their first language and translators as necessary. In an online interview, the participants are placed in a breakout room to complete the task; in face-to-face interviews, the interviewer encourages discussion between participants and remains largely detached. This *linguistic space* promotes high-quality discussion while the task is completed. Once the task is complete, the participants present their results and then discuss them with the interviewer. The group then moves on to the second task.

The approach is novel, and I claim it is a secondary contribution to knowledge (complementing my main contribution related to visual metaphors). A peer reviewer of the paper I wrote for CERJ (Cotterill, 2022b) emphasised the cultural sensitivity that was implicit in the approach, reflecting a reported potential difficulty associated with asking Chinese students to talk openly about how they feel about their learning experience; they may be uncomfortable about expressing negative opinions (Long & Aziz, 2022).

Figure 5

The Integration of Tasks into Process Interviews



Process interviews have similarities with *photo-elicitation,* which involves, in its most basic form, using photographs as part of an interview to provide context for discussion and questioning (Harper, 2002). It is reasoned that “images invoke deeper elements of human consciousness than do words” (Harper, 2002, p. 2) and, therefore, more information and different types of information are generated. Images may push deep into parts of consciousness that words are unable to. The term photo-elicitation was first used by Collier (1957), who employed it for anthropological research into mental health issues. He felt that using photos sharpened participants' memory and resulted in more extended and insightful interviews in which participants were less fatigued by the process. He described the use of images as a “compelling effect upon the informant, its ability to prod latent memory, to stimulate and release emotional statements about the informant’s life” (Collier, 1957, p. 858). Photo elicitation has been used extensively in educational research (e.g., Dempsey & Tucker, 1994; Smith et al., 1998).

Process interviews also have similar features to interviews based on *stimulated recall*. This typically involves video or audio in a post-lesson interview (O’Brien, 1993). A split

screen may be used with the former, showing the teacher on one side and the student(s) on the other. The approach has been used successfully in educational research (Edwards & Marland, 1982; Edwards & Marland, 1984; Marland & Edwards, 1986). Stimulated recall has been used in AR studies to better understand students' thinking processes when they are learning (O'Brien, 1993). An advantage of the technique is that it maintains a naturalistic context in which reflection on the learning process can occur (Marland & Edwards, 1986), improving the process validity of the research (Heikkinen et al., 2012). The freshness of the context and the connection promoted between the participant and researcher are valuable. The "process provides a medium through which the teacher and the student can interact, using first hand data, with thinking as the focus for the discussion" (O'Brien, 1993, p. 219). This may help to generate data that "is both diverse and rich" (O'Brien, 1993, p. 220).

Process interviews are also similar, in some ways, to the concept of *thinking aloud*, a verbal protocol analysis technique that is influenced by the work of Ericsson and Simon (1998) and draws on much earlier work by Newell and Simon (1972) into cognitive information processing. The concept of thinking aloud assumes that recalling information from working memory in the moment of experience is likely to yield better quality research results and richer data than attempting to draw on long-term memories (Fonteyn & Fisher, 1995; Willis, 2004). It has been demonstrated to be highly effective in a cognitive interviewing context where a deeper understanding of participants' thought processes is desired (Priede & Farrall, 2011). For Ericsson and Simon (1998), a particular strength of the thinking aloud protocol is that it slows down cognitive processing to enable a more *investigative* feel to be achieved in an interview.

A structured form of thinking aloud has been effectively applied to identifying misunderstandings in objective tests (Peterson et al., 2017). This approach builds on the assertions of Tourangeau (2003) that when responding to an interview question, a participant engages in four distinct cognitive operations: comprehension of the question, retrieval of the relevant information from memory, making judgements about the retrieved information and choosing how to form a response. As a participant moves through each stage, there is potential for error; an approach to questioning that asks

participants to explain their reasoning at each step has been shown to increase the validity of responses by identifying misalignments, for example, in terms of interpretation and planned meaning (Peterson et al., 2017). Cousin (2009) refers to using a "task question" (p. 86) where a participant is asked to perform a task which is then used as the basis for interview discussion. Although this seems strikingly similar to my approach, most tasks that Cousins suggests are passive, such as reading a passage or looking at a photograph. However, she propounds that participants could be asked to create a drawing to depict something.

The action of performing a task and then being asked to talk about how they had completed it in a particular way follows Mason's notion of the *Discipline of Noticing* and the concepts of *account-of* and *account-for* (Mason, 2002). It is logical that unless a feature or phenomenon is first truly noticed and attended to, a participant will be unable to discuss it (Loughran, 2006). To do this, the most pertinent features must be identified (Van Es & Sherin, 2002). Mason explains that an *account-of* "describes as objectively as possible by minimising emotive terms, evaluation, judgement and explanation. It attempts to draw attention to or to resonate with experience of some phenomenon. But a phenomenon is a construction made by a person" (Mason, 2002, p. 40). Whereas "To *account-for* something is to offer interpretation, explanation, value-judgements, justification, or criticism. To give an *account-of* is to describe or define something in terms that others who were present (or who might have been present) can recognise" (Mason, 2002, p. 41). Mason suggests that the key question researchers should ask (in his text, he is discussing asking oneself) is *why*. Pantalon (2011) advocates that when speaking to someone about difficult-to-articulate issues, moving from a rigid format (such as the diamond nine task in the case of my research) to asking participants *why* assists with helping them to explain their thoughts. Our memories are unreliable (George, 2018), which makes process interviews a potentially powerful way to overcome this problem, ensuring that what is discussed is based on fresh cognitive experiences, not drawn from long-term memory where recall may be hazy.

I have made six conference and symposia presentations based on my research, each of which has included (to a greater or lesser extent) a discussion of process interviews (see Appendix 3). The feedback I have received supporting the technique has contributed to my work's dialogic validity (McAteer, 2013). It has also increased my confidence to claim that process interviews are a modest secondary contribution to knowledge. In Chapter 5, I discuss how process interviews were used to collect data, providing details of the tasks used.

3.10: Participants in the Research

With quantitative research, the simple rule of thumb is that the bigger the sample from the population size the better (Opie, 2004). However, with qualitative research, the sample and sample size should be sufficient to answer the research questions in a meaningful and trustworthy way, with the selected participants being those that are best placed to answer the research questions (Newton Suter, 2011). A high participation rate in a qualitative study helps to reduce bias and to strengthen the trustworthiness of the research by better reflecting the views of the population as a whole (Newby, 2014).

Table 3 summarises some key data relating to the participants in my study (chapters 4 and 5 include more details about the profiles of participants). The participation rates, measured as a percentage of the cohort (or population) available to be participants, in many of the data collection activities was 100%.[13] In each cycle except the second, all students in the cohorts were taught by me.[14]

[13] The high level of participation is discussed in sections 5.2.5, 7.2 and 7.5.
[14] As explained in more detail on page 140, this impacted on the lower participation rate in Cycle 2. Only students taught by be were invited to participate in the Cycle 2 focus groups; the participation rate of this subset was 100%.

Table 3

Participants in the Research

Data collection method	Cycle	Participants	Number of participants	Participation rate	Groups
Survey	1	ITM students	22	76%	n/a
Survey	2	ITM students	22	61%	n/a
Semi-structured interviews	1	Chinese PG education students	8	n/a	n/a
Focus groups	1	ITM students	8	n/a	3
Focus groups	2	ITM students	18	50%	6
Profiling survey	3 & 4	ITM students	49	88%	n/a
Metaphor extension exercises	3	ITM students	22	100%	n/a
Metaphor extension exercises	4	ITM students	34	100%	n/a
Metaphor elicitation	3	ITM students	22	100%	n/a
Metaphor elicitation	4	ITM students	34	100%	n/a
Process interviews	3	ITM students	22	100%	8
Follow-up questions	3	ITM students	17	77%	n/a
Process interviews	4	ITM students	34	100%	12
Phased narrowing	4	ITM students	34	100%	12
Phased narrowing: explanations	4	ITM students	12	35%	n/a
Feedback on model	4	ITM students	10	29%	n/a

The sampling technique used could be described as *purposive*, as I was interested in a “closely defined group” (Newby, 2014, p. 251), specifically international postgraduate management students operating in a second language; 100% of the participants

fulfilled these criteria.[15] A carefully and appropriately selected purposeful sample can help qualitative researchers achieve a high level of depth of understanding (Palinkas et al., 2015). All participants in my study were enrolled as full-time students at the UNE. The high level of participation has helped to provide a wide range of rich data that has been used to answer the research questions.

3.11 Using Chinese or English?

As explained above, through process interviews, opportunities were provided for participants to use their first language when discussing tasks, but the interactions with me were almost entirely in English. I can speak only elementary Mandarin Chinese. Consequently, I would be unable to realistically conduct anything other than superficial and extremely basic interviews in Chinese. It is worth reflecting on whether this was a disadvantage to my research and whether it impacted the quantity and, more importantly, the quality of the data I collected.

Cortazzi et al. (2011) evaluated language choices made by researchers whose participants were Chinese and conducted their own research to investigate how these choices impacted the richness of the data collected. They argue that this issue is generally given too low a priority in methodological discussions of research; the assumption often made by researchers is that if participants have English of sufficient standard to engage in study in that language, then they should also be able to engage in interviews in English (Durkin, 2004). Cortazzi et al. (2011) assert that providing participants with a *choice* of language enables them to better express themselves, particularly in relation to being critical or evaluative. Other researchers have claimed that even when participants appear fluent in a second language, in the context of an interview, they may lack confidence and feel incompetent (Miller, 2010) and that language issues may mediate their ability or desire to express their thoughts clearly

[15] In previous cohorts there have, on occasion, been students for whom their first language was English. No such students were in the cohorts who contributed to this study.

(Skyrme, 2007). Xerri (2018) contends that participants operating in a second language find it more challenging to express themselves in interviews. There is also a danger that participants misunderstand questions (Esposito, 2001), resulting in incorrect responses. Some of these arguments suggest a potential weakness in my data collection and imply that richer data would have been obtained had interviews been conducted entirely in the participants' first language.

However, in their review of research papers, Cortazzi et al. (2011) found evidence that some participants might welcome the opportunity to practise English through an interview and so would prefer to use it. I found that to be the case with my participants; when I offered them the opportunity to speak in Mandarin (when completing the tasks), some continued to speak predominantly English and needed encouragement to move back into their mother tongue. In terms of issues relating to language skills, Cortazzi et al. (2011) warn:

> Researchers may overestimate participants' language skills yet underestimate the practicalities of speaking in a second language; participants who converse freely on social topics can feel constrained discussing more complex or technical topics; degrees of meaning and expression can be sacrificed in the trade-off between participants' desire to express complex thoughts or expressions and a need to simplify language in feasible expression. (p. 509)

I attempted to overcome these potentially significant problems in the Phase 2 process interviews by encouraging participants to use their first language when completing the embedded tasks. As Cortazzi et al. (2011) report, the advantage of this technique is that "data elicited in one language may be discussed and interpreted in a second language by other team members before reporting results in the second language" (p. 509). They emphasise that interview discussion in English will take longer, something I was prepared for and budgeted time accordingly. I also encouraged participants to help each other with language problems and to use translation software as necessary.

Much of the above discussion implies that there is a danger that researchers who are interviewing Chinese learners entirely in English will gain only a tiny fraction of the complete picture, and the data collected may therefore be of poor quality. However, given that I wanted participants to disclose problems/weaknesses and drawbacks with my teaching, there may have been some advantages to using English. There are, for example, the issues of preserving harmony in interactions and saving face - cultural issues that can mitigate the questioning of Chinese participants (Long & Aziz, 2022). Cortazzi et al. (2011) explain that “it is possible that interviews in English with a westerner may lead to a frankness not disclosed to a fellow Chinese in Chinese on some topics” (p. 519). They found examples of participants divulging more sensitive and personal information when interviewed in English, supporting similar arguments by Durkin (2004). These assertions imply that reporting sensitive topics in English rather than in Chinese may have provided some advantages regarding the frankness and honesty that participants exuded. A Chinese participant might break away from a cultural expectation when speaking in English, for example, the norm that Chinese students are not lazy. Spivak (2015) argues that listening to the voices of students is always culturally situated. As such, the listener should be culturally sensitive.

3.12 Deductive Analysis

A deductive approach begins with theoretical assumptions and applies these to research design, data collection, and data analysis (Pearse, 2019). An elementary form of deductive analysis was used in Cycle 1. Basic data was collected through the recordings of the focus groups, so a simple deductive approach was appropriate for analysis (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005). The focus group guide had structured prompts designed to explore aspects of theory, including whether the use of visual metaphors was useful. These prompts were used as headings under which I made notes as I listened (and relistened) to the recordings of the focus groups.

3.13 Framework Analysis

In Cycle 1, I interviewed Chinese postgraduate education students at the UNE. A large quantity of data was collected through the interviews, necessitating a more structured approach to analysis than was needed for the Cycle 1 focus groups. I decided to use the *framework method* (Gale et al., 2013) as this provided a suitably simple structure and would provide an opportunity to explore an alternative analysis method that might have been suitable for the larger datasets that would be encountered in subsequent cycles.

A framework analysis involves identifying *thematic codes* from the interview audio and using these to generate columns in a matrix, with the rows representing participants (Ritchie et al., 2013). The cells produced are used to summarise data from the interviews. When the data contains common themes, as it was with my interviews, this simple and systematic approach to organising the data can be very effective (Gale et al., 2013).

3.14 Thematic Analysis

3.14.1 What is Thematic Analysis?

My principal analytical technique for Cycles 2, 3 and 4 was thematic analysis (TA). TA is a pattern-based approach to analysing data (Braun & Clarke, 2021a) and is arguably a distinct analytical method (Vaismoradi et al., 2013), composed of a clear set of procedures (Braun & Clarke, 2013). The attractiveness of TA is that it allows the researcher to identify meaningful themes and patterns across a potentially large dataset to answer their research questions (Braun & Clarke, 2006). The method may also offer unanticipated insights and highlight differences and similarities between items in the dataset or across datasets. For qualitative researchers, it offers the advantage of being able to “capture complex, messy and contradictory relationships that prevail in the real world” (Damayanthi, 2019, p. 4).

Braun and Clarke (2018), with whom the approach is most closely associated, argue that TA is not a singular method but has a range of variations. They define TA as “a method for identifying, analysing and reporting patterns (themes) within data” (Braun & Clarke, 2006, p. 79). Braun and Clarke have become primarily focused on *reflexive thematic analysis*, which they argue is the form of TA best suited to qualitative research (Braun & Clarke, 2022). A distinctive feature of reflexive TA is that it does not claim to be value-neutral. Instead, it embraces reflexivity (Braun & Clarke, 2021b).

3.14.2 Stages of Thematic Analysis

The following is a summary of the approach to TA that I have taken. Braun and Clarke emphasise how the researcher should not approach TA as a rigidly structured format that must be worked through “like a baking recipe” (Braun & Clarke, 2019, p. 589). Instead, they argue that when a researcher chooses to use TA, they should engage with the *process*. However, TA's structured guidance and systematic approach make it inherently attractive (Braun & Clarke, 2021a).

1. Transcribing, reading and familiarisation with the transcripts to notice and begin interpreting items of interest (Damayanthi, 2019). Braun and Clark (2013) emphasise the importance of conducting this process using the theoretical lens relevant to the researcher’s focus; they term this “analytical sensibility” (p. 7). My research uses the theoretical lens of conceptual metaphor theory which has its own conceptual framework and vocabulary, shaping how I have used TA. As I transcribed interview recordings, I was mindful of how, when participants expressed their reasoning, it might be viewed through this lens.

2. *Coding* to identify items of data that may be pertinent to answering the research questions (Damayanthi, 2019). Braun and Clarke (2013) define a code as “a word or brief phrase that captures the essence of why you think a particular bit of data may be useful” (p. 207).

Codes, and their associated themes, may be *semantic* (data-driven) or *latent* (researcher-driven). The latter involves an interpretive role for the data analyst (Boyatzis, 1998). Semantic coding is based on the surface meaning of the data or the overt meaning expressed by participants (Braun & Clarke, 2021a), while latent coding "starts to identify or examine the *underlying* ideas, assumptions, and conceptualizations - and ideologies - that are theorized as shaping or informing the semantic content of the data" (Braun & Clarke, 2006, p. 84). Latent coding involves the researcher imposing their standpoint on the process (Braun & Clarke, 2021a). Coding should be viewed as an inherently subjective process; it is here that the acknowledgement of reflexivity is essential, as reflexive TA involves the researcher openly expressing how their values, assumptions, and theoretical lenses shape their approach to the process of coding and theming (Braun & Clarke, 2021a). Braun and Clarke encourage the researcher to focus on the themes rather than the codes, arguing that the latter risks a focus on believing that the truth is there to be found in the data (Braun & Clarke, 2016). Braun and Clarke also warn that relying on technology to conduct the coding and theming process (for example, using NVivo) can result in what they call "lazy coding", where the researcher stops thinking about meaning and loses focus on understanding the data (Braun & Clarke, 2022).

3. Identifying patterns: moving from codes to *themes*. Braun and Clarke (2006) state that a theme "captures something important about the data in relation to the research question and represents some level of patterned responses or meaning within the data set" (p. 82). Themes may not necessarily depend upon the frequency of codes; codes that do not appear often may still form powerful support in helping to answer a research question (Braun & Clarke, 2021b). Braun and Clarke (2006) assert that the importance of a theme is also not necessarily dependent on the frequency of appearance. Instead, themes are generalised, "patterns of shared meaning underpinned by a central organising concept" (Braun & Clarke, 2019, p. 589). The counting of codes *may* be relevant. For example, the number of occurrences or participants who express

a particular view may have a bearing on whether something is deemed to be a theme (Braun & Clarke, 2021b).

Braun and Clarke (2021b) warn against expecting themes to *emerge* from the data. The researcher does not *find* the themes, and data sets do not contain themes that are waiting to be liberated; instead, the researcher acts as interpreter and must hold responsibility for generating first codes, and then themes, through the approach that they choose to take (Braun & Clarke, 2021a).

Braun and Clarke (2021b) stress that researcher judgement is key to determining themes and emphasise that high quality and meaningful TA often uses a small number of themes - often in low single figures. They contend that researchers who generate large numbers of themes are in danger of losing the richness of the data; it is better to tell detailed stories about each theme, avoiding the temptation to add more and more themes as the analysis develops (Braun & Clarke, 2022).

4. Analysis, which can be described as telling "the complicated story of your data in a way which convinces the reader of the merit and validity of your analysis" (Braun & Clarke, 2006, p. 93). This process involves extracting vivid examples and selecting quotations. Braun and Clarke (2006) emphasise that the analysis does more than describe the data. It provides a clear, coherent, and compelling argument. I have attempted to do this by incorporating examples of images into the analytical text and using quotations from participants to provide an authentic voice to their contributions.

3.14.3 Why Thematic Analysis?

I chose TA to analyse the data collected in Cycles 2, 3 and 4 primarily because of its flexibility. It is also suitable for generating themes *across* datasets (Braun & Clarke,

2006), a requirement that became increasingly necessary as I widened the range of data collection methods employed. In Phase 2, for example, the data from the process interviews was supplemented by other sources, such as the images and explanations from the phased narrowing exercise. Braun and Clarke (2021a) suggest that the flexibility of TA may be useful when data is in a variety of formats such as this.

Flexibly applying latent and semantic coding (Braun & Clarke, 2006) was also attractive and compatible with my research questions, data types, and conceptual frameworks. In some places, in transcripts, meaning was explicitly stated by participants, allowing for semantic coding. However, given the complex metacognitive nature of the process interviews, I also attempted to interpret meaning from passages within the transcripts; these latent codes became an essential part of the analysis. Using latent codes fits closely with a constructivist approach (Braun & Clarke, 2022), where researchers build meaning by interpreting data and patterns. As Braun and Clarke (2019) explain, choosing whether latent or semantic coding is chosen, is not always an either/or choice. This flexibility was compatible with the often subtle or nuanced aspects of the transcript, related to both language issues and the complexity of the material under discussion.

3.14.4 Embracing Reflexivity

Braun and Clarke (2019) prefer to use the term *reflexive TA* to describe the form of TA associated with their work. In using this term, they stress the importance of the role of the researcher in creating knowledge. Sword (2012) explains how the objectivity to which some researchers aspire is impossible and extends into the way they present their findings:

> Academic writers often strive to convey a completely neutral perspective; as merchants of truth rather than fiction, we see it as our job to inform readers, not to play with their expectations or their minds. Yet that neutrality, when examined closely, turns out to be something of a myth. (p. 94)

Braun and Clarke (2019, 2022) emphasise that codes and themes do not emerge but are created by the researcher through the analysis process. Qualitative research, such as mine, is inevitably subjective, although rather than viewing it as an obstacle to creating knowledge, it can be embraced as a resource (Finlay & Gough, 2008).

Braun and Clarke (2019) describe the TA process as one of "telling stories" (p. 591), a framing that I have used to title the chapters of this thesis in which I discuss and analyse the data collected. They argue that qualitative data analysis is a reflexive process of interpretation and creation by the researcher, not discovery. Themes are not passive and waiting to be found (Ho et al., 2017). As Braun and Clarke (2019) state, "Themes are creative and interpretive *stories* [emphasis added] about the data, produced at the intersection of the researcher's theoretical assumptions, their analytic resources and skill, and the data themselves" (p. 594). They prefer to use terms such as "develop" (Braun et al., 2016, p. 741), "constructing" (Braun & Clarke, 2022), and "generating" (Braun & Clarke, 2019, p. 593).

The control afforded by embracing reflexivity enabled me to guide the entire research process in the desired direction. I wanted to answer *my* research questions, and I have been able to focus my analysis on obtaining sufficient processed data to do this. Further, by acknowledging that the theoretical frameworks I have chosen to use have affected how I have used TA, I have attempted to be entirely transparent about my decisions with regard to the analytical process. In practice, this has meant that when coding, theming, and analysing, I have been mindful of the theories that frame my research and the vocabulary embedded in them.

3.15 Generalisation, Transferability and Resonance

It is broadly accepted that AR findings are not generalisable, as the data collected is usually specific to a practitioner in a particular situation and context (Tracy, 2010). Cultural differences also mean that qualitative research may have a high level of locational specificity (Stake & Trumbull, 1982). Not all agree with this assertion.

Thompson and Perry (2004) argue that the results and findings from AR *can* be generalised to other similar settings, while Rolfe (1998) when discussing medical research, claims that when multiple case studies are used and interpreted by experts, AR results *are* generalisable. Bassey (1999) contends that non-scientific research findings would be better termed "fuzzy generalisation" (p. 51), using the concept to refer to tentative applications and predictions in other contexts but emphasising that an educational researcher is likely to encounter many problems and questions when attempting to generalise. He clarifies that the generalisability will, inevitably, depend upon the similarity between the context studied and that in which the research findings are being applied. Moseley (2022) argues that if AR is to bring about positive change in the ambitious way that it often aspires to, if its findings are not disseminated and used by others, this will not happen.

The instructional design technique I have evaluated may be helpful as a teaching tool for those who are also attempting to deliver concept-heavy courses to international students. When findings are used to claim applicability to a different context in this way *transferability* is being claimed (Bassey, 1981; Guba et al., 1989). Transferability is achieved when the readers of a report's findings feel that the research story overlaps with their own context (Tracy, 2010). Tracy (2010) uses the term *resonance* to describe the "research's ability to meaningfully reverberate and affect an audience" (p. 844) and argues that high-quality qualitative research can have transferability to other contexts and have impacts in and on them. Other practitioners will undoubtedly be facing similar issues. However, also, "researchers can engage in practices that will promote empathy, identification, and reverberation of the research by readers who have no direct experience with the topic discussed" (Tracy, 2010, p. 844).

Caution is needed here to clarify that resonance is not the same as generalisation. Tracy (2010) explains that formal definitions of generalisability (as used in the positivist, scientific domain) do not apply to qualitative research situations. For example, scientists may generalise by demonstrating that identical outcomes can be achieved by others who replicate their experimental methods. However, I hope readers may find resonance through what Tracy (2010) describes as "vicarious

experience" (p. 845), in which high-quality reporting of research can find meaning with those in other contexts or cultures. McNiff and Whitehead (2009) describe how other practitioners may realistically make use of AR findings: "they may be able to adopt or adapt your ideas to their practices" (p. 64).

The construction of a model of strong visual metaphor (Section 6.3) is an example of my creating an example of a "fuzzy generalisation" (Bassey, 2001, p. 51). The model builds generalisations from multiple transferable components (Briggs, 2007) and hopefully enables them to resonate with others in a useful way.[16]

3.16 Telling Stories

I have used the terminology of *storytelling*, reflecting McNiff and Whitehead's (2009) assertion that AR involves, "Telling the story and sharing your findings: telling others what you have done and how you have done it, and why it is important" (p. 11). This storytelling is designed to show the process I have moved through as I have refined my data collection methods, reflecting the view that AR reporting is not only about knowledge creation but about showing "the learning that led to the creation of that knowledge" (McNiff & Whitehead, 2009, p. 13); the reporting should clarify the data collection, not just report the actions and impacts. Presenting my research as stories shows that they are "distinctive because they contain, among other things, people, actions, a plot and a script" (McNiff & Whitehead, 2009, p. 22). All these elements are fundamental to my study.

[16] Examples of feedback I have received from other practitioners and researchers are provided in section 3.5.2. This feedback is representative of a high level of resonance.

3.17 Conclusion

This chapter has provided an overview of my methodology and the research design and methods I have employed across the four cycles of my AR. The reasons for using an AR approach have been explained at length, with particular justification for employing pedagogical AR. How the validity of an AR inquiry can be most appropriately judged has been described, and the techniques that have been used to validate this study have been explained, with particular emphasis on the value of dialogic validity. The chapter has explained the steps I have taken to ensure that my research maintained high standards of ethics. The research methods used have been described, and their choice has been justified. How the research methods have evolved, in some cases by generating original methods to collect data, has also been outlined. The chapter has also explained and justified how my approach to qualitative data analysis has similarly evolved as the complexity of the data collected has increased. Finally, a clear distinction has been made between generalisation, transferability and resonance - key to understanding how RQ3 has been answered - and my use of a storytelling approach to describing the research has been explained.

Chapter 4: Stories from Phase 1

4.1 Introduction

This chapter outlines the first two cycles of my research, Cycles 1 and 2, which I have collectively termed Phase 1. Initially, I had envisaged that the first cycle would be a purely pilot cycle, used to expose any deficiencies in my research methods and the research instruments used (Hassan et al., 2006), thus strengthening the process validity of the research (Burns, 2009; Heikkinen et al., 2012). However, as well as exposing some weaknesses in the research methods, Cycle 1 generated valuable foundational data. The cyclical nature of my AR study has meant that I have not only adjusted and adapted the materials related to the topic I am researching, but I have also revised and developed the research methods and instruments to more effectively capture data that could help to answer my research questions. This second iterative process has ultimately been critical to the progression of my research and the quality of the data I have collected.

4.2 The Story of Data Collection

4.2.1 Piloting

A pilot is a small-scale study designed to test data collection instruments, sampling methods and approaches (Stewart, 2016). The piloting process should help refine research instruments (Gillham, 2000a) and identify problems or unnecessary questions (Hassan et al., 2006).

Piloting is often associated with positivist studies, such as quantitative health-related inquiries (Malmqvist et al., 2019). However, Sampson (2004) argues that pilot studies are not used as extensively as they should be in qualitative research and that when employed, they are often used in an informal and unsystematic way.

In Phase 1, data were collected using two main research methods, surveys and focus groups (although semi-structured interviews were used to collect data from the postgraduate education students). There *was* an element of piloting, given that this was the first stage of my research, and that Cycle 1 was the first cycle of the AR. The cycle was exploratory, as I was testing out research methods to judge the quantity and quality of data they generated and how useful this data would be to help answer my research questions. As Guest et al. (2017) recommend, it provided a valuable opportunity to pilot the focus group guide. Importantly, critically reflecting on the methods used in Cycle 1 helped shape how the focus groups eventually evolved into process interviews.

4.2.2 The Surveys

In Week 4 of Cycles 1 and 2, students were invited to participate in a survey. The survey's primary purpose was to collect profiling and contextual data on the cohort. The questionnaire used in Cycle 1 (see Appendix 8) included questions to establish where students were from, what subjects they had studied at undergraduate level and their experiences and expectations of lectures.

The questionnaire also included a small number of questions that asked participants about the use of visual metaphors in my lectures. Now four weeks into the course, students had been exposed to eight lecture recordings with visual metaphors embedded within them. An example image (Figure 6) was included in the questionnaire to help remind participants of how the images had been used (Newton Suter, 2011). In Cycle 2, the questionnaire also asked about student experiences using visual metaphors in seminars (see Appendix 9).

Figure 6

Image of Duck and Ducklings Used in Phase 1 Questionnaire



4.2.3 The Focus Groups

The focus groups in Cycles 1 and 2 were held and recorded through Zoom. The focus groups in Cycle 1 used a simple guide and related questions (see Appendix 10). The primary purpose of the focus groups was to discuss how participants felt about the use of visual metaphors in the lectures and effectively to decide whether this approach was worthy of further investigation. I also wanted to evaluate the use of focus groups as a data collection method. Ten images were taken from lectures and used as stimulus material (see Appendix 11). Participants were asked to explain what they thought the target concept was for each image and to discuss the effectiveness of the images, identifying those that were helpful and those that were unhelpful in terms of finding meaning.

There was an existing rapport between me and most of the participants as I had been teaching them for four hours a week for the last seven weeks. However, the dynamic shifted somewhat as I was now asking them for feedback, whereas they had been used to me providing feedback on their work and contributions. It was clear that participants sensed this shift and there was hesitancy on the part of some to contribute or to be critical. Despite this, the atmosphere was positive, and I was surprised by the high level of enthusiasm that participants demonstrated, particularly when completing the practical tasks.

The first stage of the Cycle 1 deductive analysis (Pearse, 2019) involved making summary notes under the focus group prompts while listening to the recordings. This process took approximately six hours to complete, as each recording had to be listened to several times. I was then able to produce the analytical text presented in section 4.3.2. This form of deductive analysis - driven by the focus group prompts - was a very simplistic approach, but the data was basic and relatively homogenous across the three focus groups. The material in the recordings was so meandering in places that I decided not to attempt transcribing the discussions.

A disadvantage of using deductive analysis with the focus group data was that I generalised what participants said in summary and used my own words when interpreting their voices. I did not take quotations from the recordings. This is not necessarily a weakness given the simplicity of the data and is arguably an effective way to reflect the main issues in the data (Thomson & Kamler, 2016). However, the insights I needed to be able to effectively answer my research questions were not forthcoming.

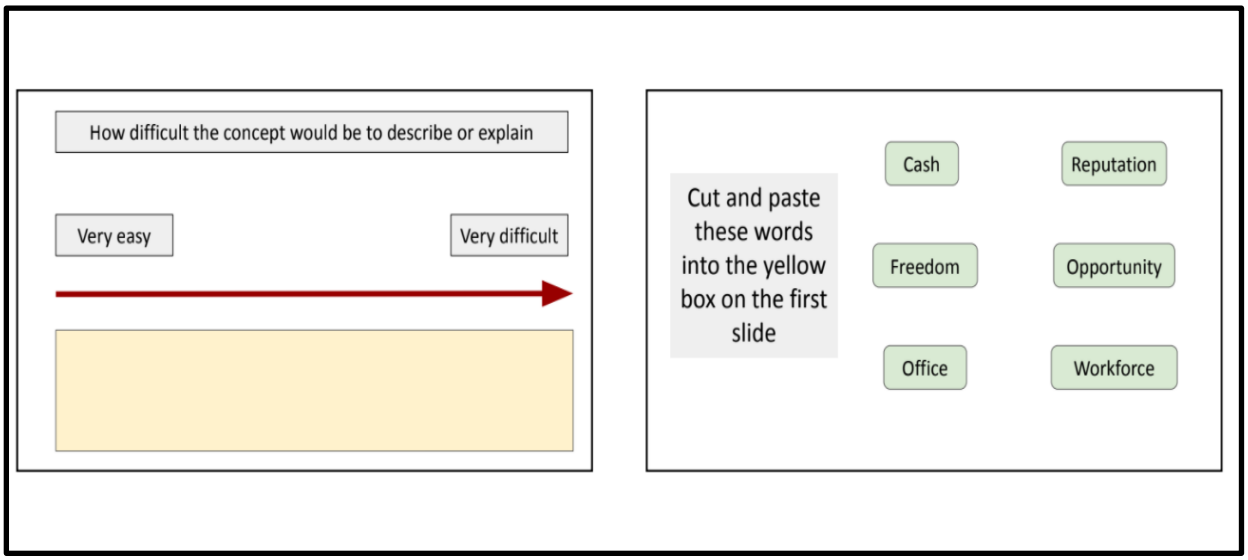
In Cycle 2, I shifted the emphasis of the focus group discussion to talking more about what *types* of images were most effective as visual metaphors and why. The focus group guide for Cycle 2 (see Appendix 12) was more complex, and the structure of the focus groups was changed by introducing three tasks into the discussion.

The first task in the Cycle 2 focus groups was an exercise which involved sorting six concepts into how difficult they would be to explain to someone else. Being able to do this is arguably a facet of understanding (Wiggins & McTighe, 2005). Three concepts were abstract (reputation, freedom, and opportunity) and three concrete (cash, office, and workforce). The task involved the participants working as a group to put the concepts, presented using editable Google Slides, in order of difficulty (see Figure 7). I then asked them to explain their decisions and the reasoning behind them.

The abstract and concrete concepts task was completed enthusiastically by each group. There were purposeful discussions about what order to place the items in, and the explanations provided varied from the simplistic to the highly articulate. However, on reflection, this activity did little more than demonstrate that abstract concepts are more challenging to describe or explain than concrete concepts. Except for the term *workforce*, all groups quickly placed concrete concepts in the 'very easy to explain' zone and abstract concepts in the 'very difficult to explain' zone.

Figure 7

Scale of Abstraction Exercise



The second task in the Cycle 2 focus groups was similar to the one used in Cycle 1. However, in this cycle I presented four, rather than ten, images taken from lectures (see Appendix 13). The reasoning behind this was to narrow the focus of the discussion to generate richer data about the use of visual metaphors. The participants were asked to talk about and then explain which images they found easiest and most difficult to interpret in terms of the concept they had used to represent. A slide with a short explanatory phrase containing the target concept was also presented (see Appendix 14). Participants were encouraged to discuss the most and least useful and why this was. The task stimulated interesting discussions in each group, with the reduced number of images helping to create a sharper focus.

The third task involved showing the participants two slides, each with two images. One image was a metaphorical representation, the other a literal or business-related image, with the target concept labelled on the slide (see Appendix 15). The participants were asked to discuss which image was most helpful for gaining an understanding of the concept and why.

I had wondered if participants might describe the use of visual metaphors as childish, but they did not. Even when I pushed them about this directly, all participants were adamant that they did not think that it was a childish approach. This was reassuring but surprising; I had expected some participants to tell me that using visual metaphors was *not academic* and so detracted from the credibility of the teaching.

Some of the issues discussed in the focus groups were also not relevant. For example, in the Cycle 1 focus groups, we explored the use and value of lectures and what constituted a good quality lecture. A large quantity of interesting data was generated, but much of it was of little direct value to this particular study. The loose nature of a focus group discussion inevitably meant that extra, surplus data was provided, but I was concerned about how much time was devoted to largely irrelevant topics. Tightening the direction in which the discussion moved, in the Cycle 2 focus groups, helped me to better attend to my research questions (particularly RQ2) and to obtain more meaningful and relevant data.

I know from my previous experiences of moderating focus groups that rapport between the moderator and participants can make a big difference to the quality and flow of the discussion (Guest et al., 2017) and, ultimately, the quality of the data generated (Coe et al., 2017). My familiarity with the participants was an advantage. They generally seemed relaxed and comfortable. The tasks needed careful explanation and, for most groups, clarification of their purpose. I realised, in both Cycles 1 and 2, that there was some unease in relation to whether English or Chinese was appropriate for the language in which participants discussed the tasks, and in relation to whether they could check the meaning of words using devices or by asking me. It was far more productive to encourage them to use their first language, freely use devices and to encourage them to ask me for clarification.

4.3 Analysis of Data Collected in Phase 1

4.3.1 The Survey Data

In Cycle 1, 22 of the 29 students in the cohort participated in the survey, the 76% response rate exceeding the notional desirable figure of 70% cited by Newton Suter (2011, p. 331). In Cycle 2, 22 of the 36 students in the cohort participated in the survey (61%). This was a lower participation rate than in Cycle 1; I did remind the students about completing the questionnaire but did not want to put them under pressure to do so. I would attribute the lower survey participation rate to the fact that one seminar group was not taught by me; the majority of those who chose not to participate were in this group and inevitably would have felt less obligation or interest in participating. In total, 44 students participated in the Phase 1 surveys, a participation rate of 68%, which was close to the rate aspired to by Newton Suter (2011).

In Cycle 1, 82% of the participants and in Cycle 2, 90% of the participants had completed their first degree in China. This was lower than the 95% that has characterised most cohorts over the last five years but still represented a clear predominance of Chinese students.

Business, management, or economics were the undergraduate subjects taken by 67% of the participants in Cycle 1 and 59% in Cycle 2. Although this might indicate that most students already had familiarity with the subject matter, I know from experience that the material covered in the ITM course is entirely new to the vast majority of those who take it, even those who have previously studied management.

55% of Cycle 1 participants expected lectures to provide a detailed explanation of a topic, with 41% expressing the view that they expected lectures to provide only basic details of a topic. The figures for Cycle 2 were 73% and 18%. The expectations of many students are at odds with the aims that lecturers often have, which are to provide basic introductory details and coverage of topics (Race, 2013). That many students expect detailed coverage of topics does not conflict with the use of visual metaphors as the images are being used to unlock the meaning of abstract concepts rather than to provide a deep, technical explanation.

In Cycle 1, 64% of the participants agreed or strongly agreed that using images contributed to the effectiveness of the lectures. In Cycle 2, 100% of the participants agreed that using images in lectures contributed to their effectiveness, with 45% strongly agreeing with the statement. Without further explanation and inquiry, it was impossible to know whether this was simply because of aesthetics, entertainment or for genuine pedagogical reasons connected with enhancing understanding. The term *effectiveness* may have been interpreted in various ways by participants.

In Cycle 1, 91%, and Cycle 2, 100% of the participants were aware of my use of visual metaphors in the lectures. This was not surprising as, by Week 4, exposure had been extensive. In Cycle 1, 87% and Cycle 2, 100% of the participants agreed or strongly agreed that the use of visual metaphors made the lectures more interesting. In Cycle 1, 86% agreed or strongly agreed that using visual metaphors helped them remember concepts, and 91% helped them understand concepts; the figures for Cycle 2 were both 100%.

When asked about the use of visual metaphors in seminars (in the metaphor extension activities), 59% of Cycle 2 participants strongly agreed, 36% agreed that they contributed to making the seminars more interesting, and 68% strongly agreed that they helped gain understanding. 100% of participants agreed or strongly agreed that the use of visual metaphors helped them remember concepts.

The surveys were not expected to provide explanations, but it was reassuring to see that the majority of responses related to the use of visual metaphors were very positive. The notion that lectures should provide detailed explanations of concepts could be somewhat concerning as this does not align with the view expressed in the literature (Race, 2013). Ultimately, the surveys provided basic data and a foundation for exploration in the focus groups.

4.3.2 The Focus Groups - Cycle 1

In Week 8 of Cycle 1, three focus groups were held, two composed of three and the other of two participants. Each of the discussions lasted approximately 30 minutes. The data produced lay neatly across the 'areas for discussion' in the focus group guide, with very similar views expressed across the three discussions. A simple deductive approach to analysis (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005) was used as the main focus of this Cycle was to establish that teaching through visual metaphors was worthy of further research. I also wanted to evaluate how effective focus groups would be as a data collection method and to identify possible target areas for further research.

All participants acknowledged that they were very much aware of how and why I used images in lectures. There was agreement by each group that using images as visual metaphors made the lectures more interesting and helped with the understanding of target concepts. Gaining interest and attention is a fundamental first step in ensuring learners engage with the learning process (Keller, 2009). When pushed, all participants found it challenging to articulate why this was, although several said that

the images helped because they replaced spoken or written explanations when new or unfamiliar concepts were introduced, which was a significant advantage to students working in a second language. At its most basic level, this alone is a powerful argument for using visual metaphors; if international students find lectures cognitively demanding, helping to reduce these demands is potentially valuable to enhancing the overall learning process and experience.

The ten images were presented towards the end of the focus group discussion. Participants were asked to interpret them in terms of what concept each was used to represent and to discuss their usefulness. Each group was asked to select the two images they thought were most useful. Each group selected the same two images. These were the image of the duck and ducklings (Figure 6) and the image of the tightrope walker (Figure 8).

Figure 8 was used when introducing the concept of *business risk*. Participants noted that it was memorable because it was such a dramatic and unusual image. The person wearing a pink dress crossing a raging torrent was described by one group as more powerful than just an image of someone crossing a tightrope wearing appropriate clothing in a more familiar location (for example, between two buildings). This reflects the argument that unusual, juxtaposed images incorporating people are especially effective for gaining attention (Isola et al., 2014). The type of risks faced by the tightrope walker being very different to the type of business risks discussed in the lecture it was taken from was not an issue. The participants in one group explained that it was a helpful way to lead into a more complex explanation of risk in a business context. Contextual transfer was possible, an issue that was identified as a particularly important theme in Phase 2 and a strong determinant of the power and effectiveness of a visual metaphor.

Figure 6 was also regarded by all groups as a very simple and clear way to understand what is meant by the concept of a leader and the view (held by some theorists at least) that leaders should have followers (Mattone, 2015). In terms of CMT, Figure 6 enabled a very clear connection to be made between the source and target domain.

Figure 8

Image of Tightrope Walker Used to Represent the Concept of Risk



Note. Image from *Dietrich, Pixabay.*

Overall, the discussions in the Cycle 1 focus groups were fairly basic in terms of insights. The participants were overwhelmingly and enthusiastically positive about the use of visual metaphors. They were generally good at identifying which concept the images had been used to represent and made it clear that visual metaphors were more useful than simple business-related images for supporting understanding. However, I could not elicit from them any detailed explanations of *why* particular visual metaphors were more helpful than others or in what context. At this point, I realised that I was asking participants to perform a *metacognitive task* - effectively to think and articulate their thinking which, as explained in section 1.6.4, is exceptionally difficult and requires deep introspection (Rhodes, 2019).

4.3.3 Interviews with Postgraduate Education Students

AR rarely takes a clear and linear path (Cook, 2009). Towards the end of Cycle 1, an opportunity arose to interview a group of Chinese students completing a master's degree in education at the UNE. A colleague was supervising a project to provide academic support to these students and offered to invite them to be interviewed by me. I knew that these students would have a high standard of English (they typically had an average IELTS score of 6.5, compared with the 5.5 that was usual for my students) and expected them, as postgraduate education students, to be able to articulate issues relating to teaching and learning in a more erudite way than management students. These interviews did not neatly fit into my research cycles. However, it was a valuable opportunity to explore some of the concepts I was interested in with a group of participants who should be capable of articulating their thoughts.

I wanted to see if students with strong English skills combined with an academic, and in most cases practice-based, background in education could articulate the *process* of learning and discuss the use of visual metaphors in the context of learning. I also anticipated that the interviews would help me to select terminology, prompts, and lines of questioning that might be introduced into the Cycle 2 focus groups.

In April 2021, I conducted eight semi-structured interviews, each lasting between 30 to 60 minutes and involving the participants answering questions about lectures, knowledge and understanding. The interview questions can be found in Appendix 16. A sample of four visual metaphors from my lectures were used to stimulate discussion (see Appendix 17). The interview questions, which I realised were potentially very challenging, were screened for the level of language by the Assessment Lead in my department using the Common European Framework of Reference for Languages (CEFR, n.d.). He, along with another academic, trialled the questions to strengthen their suitability (Gillham, 2000b) and provided me with feedback. The original questions were adjusted to ensure that the vocabulary and language were appropriate for a second language user at a postgraduate academic level. The interviews took

place via Zoom but were recorded using Otter software which, at this point, I expected to provide a higher quality audio recording than Zoom (O'Dea, 2022).

The recordings were analysed using a framework method, following the steps set out by Gale et al. (2013). The Otter software I used automatically generated transcripts, but these were extremely low quality with many errors that would have taken a very long time to correct. I decided instead to work from the audio recordings. I first listened to the recordings and familiarised myself with the content of the interviews. I then listened to each recording for a second time and identified the key thematic codes; Otter lists the most commonly used words in the recording, which was helpful with this process (Hafferty, 2020). Once I was happy that the principal thematic codes had been identified, I constructed a framework. I then worked through the recordings once more and completed the framework matrix, pausing the recordings and replaying as necessary; this was less onerous than anticipated as the interview questions had been grouped into themes. Once this was satisfactorily completed, I was able to analyse the data, identifying the most meaningful items in the matrix, looking for patterns across rows and drafting the conclusions below. This whole process was worthwhile as a means of placing the data in a format that I could interpret and use. The completed framework is in Appendix 18.

Based on the framework analysis, the following conclusions were drawn from the interviews:

1. All participants had extensive experience with lectures as a means of teaching. In China, some undergraduate courses had been delivered almost entirely using lectures rather than seminars, tutorials, or workshops. This helped explain the expectation that many Cycle 1 participants had that lectures should deliver detailed content.

2. There were some variations in the way that knowledge was distinguished from understanding. Some participants felt that understanding described a situation where coverage of a concept was superficial, whereas mastery of a concept

would constitute knowledge. Others presented a more recognisable distinction where knowledge does not necessarily equate with understanding (Anderson et al., 2001), reflected in the statement by participant PG4, “knowledge does not mean that I understand it”. When something is understood, explained several participants, it is possible to explain it to someone else. This latter interpretation sits with my preferred conceptualisation of understanding and that of Wiggins and McTighe (2005). An interesting statement was made by participant PG2 who stated that “Understanding results in the knowledge being my own”. I interpreted this as material resonating with the participant when they gained understanding - it had meaning to them.

3. Surprisingly, even though these were postgraduate education students, talking about learning was challenging. Most directly or implicitly asserted that learning was a process and that this process “involves obtaining new knowledge” (participant PG1). Given the various interpretations of knowledge and understanding, further explanation proved challenging to elicit. In line with the literature (Hattie & Donoghue, 2018), it seems that even students who are completing a postgraduate course in Education find it very difficult to explain the learning process; their understanding of what it means may form part of their tacit knowledge (Polanyi, 1958) and as such is not easily available for conscious retrieval (Kirsner et al., 1998). None of those interviewed could articulate *how* the process worked other than to suggest ways in which they studied (for example, making notes or reading books). Nevertheless, I was aware that articulating metacognition in relation to the learning process is challenging (de Blume et al., 2017), even when participants are actively involved in the academic study of learning about learning. Interestingly, participant PG2 explained, when discussing learning, that “it feels different after the learning has been successful”, using the same vocabulary relating to feelings used by De Blume et al. (2017) when describing how their research participants articulated learning.

4. All the participants provided appropriate interpretations of the four images presented (appropriate since they quickly and accurately identified the target concept using the image as a source). Most explained that they thought the images would make lectures more interesting and less boring, and they would help introduce difficult or unfamiliar concepts and develop an appreciation of the bigger picture or "broad concepts" (participant PG1). This was an alternative way to see the value of using visual metaphors; they might not only be helpful in unlocking meaning but also make clear connections with other concepts and contexts and help to provide a more general overview of a topic or issue. As participant PG2 explained, visual metaphors "might be easier for them [students] to make a connection". When discussing the speed at which concepts are communicated in lectures, participant PG4 explained how visual metaphors might be "more easier to catch the concepts"; this in itself provides a useful metaphor of concepts rapidly moving past the student watching and listening to a lecture, with the visual metaphors helping them to trap some of these concepts like butterflies in a net.

The participants all found it difficult, or in some cases impossible, to explain the *process* of learning through these images in any meaningful way. However, most explanations reiterated that images were more accessible to interpret than words, particularly for international students.

4.3.4 The Focus Groups - Cycle 2

Six focus groups were conducted and recorded via Zoom in Cycle 2. Each contained three participants and lasted between 45 minutes and an hour. These focus groups were more structured than in Cycle 1 and were built around three tasks. This was the first iteration of what subsequently became *process interviews* in Phase 2.

With a greater volume and range of data, I decided to analyse the focus group data using a basic form of TA. Producing the transcripts from the audio recordings was a slow process. I needed to listen to each recording three times in order to be able to create some coherence. The unstructured nature of some parts of the focus group discussions contributed to this problem. I used the comment tool in Word to annotate the transcripts, taking a question-driven approach to create codes (Saldana, 2012), the questions being drawn from the focus group guide. After the first attempt at coding, I worked through each transcript again while watching the video recordings of the focus groups. This helped me better understand some of the more subtle aspects of what participants were directly (through speech) or indirectly (through, for example, body language, group dynamics, and speed of response) attempting to communicate; this immersive approach to data analysis is advocated by McMullin (2021). The key codes were then grouped under the three themes (expressed as questions), as shown in Appendix 19. I then worked through each transcription again, using highlighter pens to classify each case under one of three themes. The entire process took approximately twenty hours to complete. Two examples of extracts from transcriptions that have been subjected to TA are shown in Appendix 20.[17]

Theme 1: Difficulties with Explaining the Meaning of Abstract Concepts

All the participants appeared to understand the fundamental differences between concrete and abstract concepts and the difficulties associated with explaining them. For example, participants in two groups explained that abstract concepts such as *opportunity* were lacking in "physicality", whereas concrete concepts were. As a participant in Group 2-3C explained when discussing concrete concepts, "they are real thing. You can name it, you can shape it", and a participant in Group 2-2A stated when referring to a concrete concept, "Yeah, I can touch it, so I think it's easy to explain it". A participant in Group 2-3B succinctly summarised the difference between the two types of concept: "In my point of view, the difference between these two words are

[17] The colour that the themes in Appendix 19 are highlighted in correspond with the highlighting of the codes in the extracts in Appendix 20.

physical and not physical". Other participants suggested that the different ways in which abstract concepts might be interpreted adds complexity and ambiguity, reflecting the arguments proposed by Borghi & Binkofski (2014). Participants were articulating an acknowledged problem with abstract concepts, that because they are often not tangible, making sense of them is more difficult (Borghi et al., 2018).

The concept of *workforce* proved interesting; I had chosen it as an example of a concrete concept, but all participants placed it towards the 'very difficult to explain' end of the scale, even though some initially regarded it as quite easy to explain. In hindsight, I recognise that the *force* part of the word adds abstraction and that the participants were, quite rightly, not recognising the concept as a concrete concept that described the people who work for an organisation but something more subtle (perhaps the efforts and motivations of these people, which is, of course, an abstract concept). Effectively, the addition of *force* turned a concrete noun into an abstract noun.

The appropriateness of their choices was borne out when I asked participants to explain the concepts. As explained in section 2.3, the relative difficulty of understanding abstract concepts compared to concrete concepts is widely detailed in the literature (e.g. Kirschner & Hendrick, 2020). Although the participants enjoyed the exercise and formed a purposeful start to the focus groups, the results contributed nothing new of great value to my study.

Theme 2: Strong Visual Metaphors

As with the Cycle 1 focus groups, all participants found explaining why visual metaphors might help with understanding difficult. However, most explained that images being used to convey complex ideas in place of, or as well as, verbal and written explanations were extremely helpful for international students. The simple justification was that an image with meaning would replace the need to listen to the lecturer's words or read text on the screen. Participants argued that images make

lectures more interesting and that the least interesting lectures, frequently described as ‘the boring ones’, involve text-heavy slides.

When discussing the four images, most participants easily recognised the image of the goats fighting (Figure 9) as representing the concept of *competition* (the image had been used in a section of a lecture that explored the significance of competition in markets). There was some hesitation as participants ascertained that the two goats were engaged in combat or conflict. I reflected on the image's static nature, perhaps impeding the ability to achieve the intended interpretation. In this situation, an image that better communicates dynamism would be more powerful and benefit from the potential increased attentional vigilance that Cian et al. (2015) argue such an image would create. A more dynamic image was evaluated in Phase 2.

Figure 9

Image of Goats Fighting Used to Illustrate the Concept of Competition



In group 2-C2, there was an interesting discussion about placing oneself in the image. A participant in this group described how an image might have particular meaning if “maybe we are one of the character in these photos”, reflecting the proposal made by Berger (2008) that we attempt to place ourselves in some types of image, such as landscapes, to find meaning in them.

In each of the Cycle 2 focus groups, there was some form of discussion about how the visual metaphors that used animals were effective. The theme of anthropomorphism (see section 2.12.5) using animals is explored in more depth in Phase 2 of the research and seems to repeatedly strengthen the argument that humans enjoy anthropomorphism and attribute animal characteristics and behaviours to humans (Epley et al., 2007). In line with Wang and Basso (2019) and CMT (Lakoff & Johnson, 1980), participants argued that non-human images could help understand and make sense of human actions, attitudes and behaviours. An example of this was the image of ants (Figure 10) which was used to represent the concept of *teamwork*. The image was unanimously regarded as easy to understand as a visual metaphor, with only two participants expressing distaste at images of insects, which they regarded as unclean; the subjective view that an image is aesthetically poor can reduce the level of interest shown in it (Jensen & Lieberoth, 2019).

Figure 10

Image of Ants Used to Represent the Concept of Teamwork



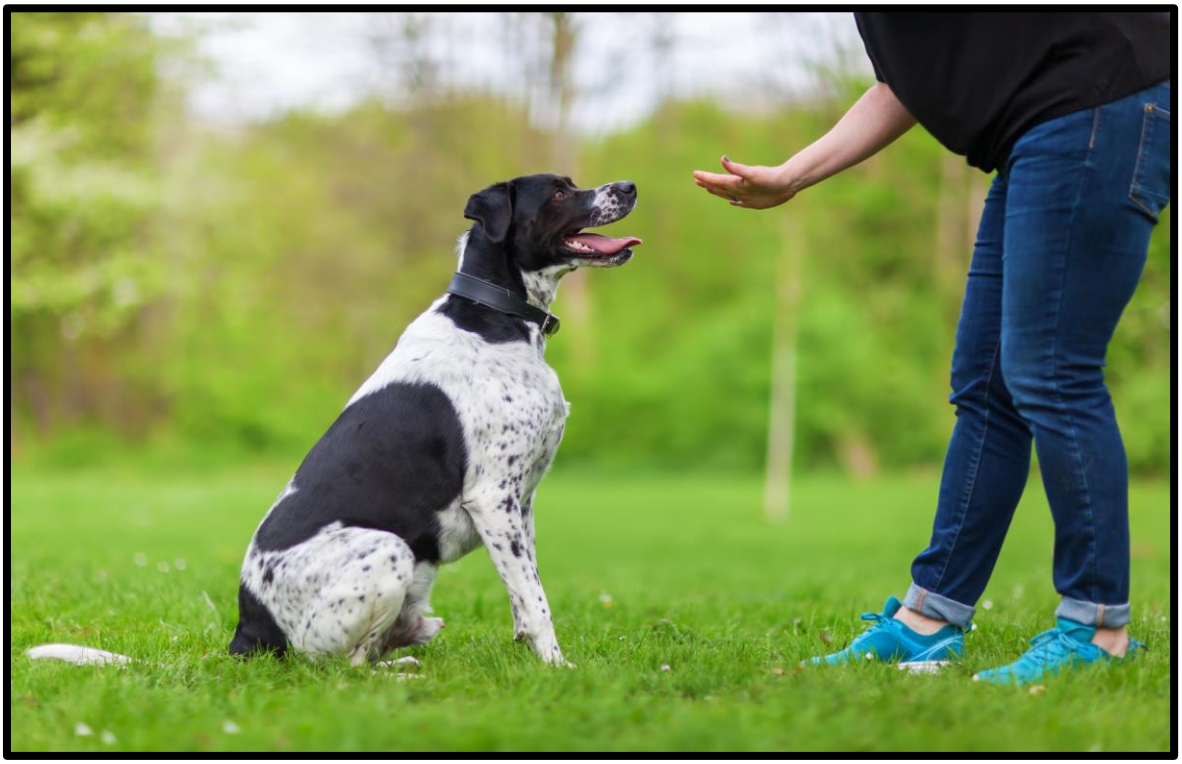
Theme 3: Weak Visual Metaphors and Improvements

I pushed the participants very hard to explain what was *not* effective far more than what *was* effective. As the focus groups progressed and having learned lessons from Cycle 1, I knew that it would be very easy to generate excessively positive data that did nothing more than endorse my use of visual metaphors. A victory narrative AR project (McDonagh et al., 2022) would not be worthy of claiming a high level of outcome validity (Heikkinen et al., 2012) as it would celebrate what was effective while not acknowledging what was ineffective. I wanted to explore what *did not* work well and *why* to get closer to understanding how to use visual metaphors in the most impactful way. Consequently, this Theme 3 analysis is more detailed than the other themes for Cycle 2.

The picture of the dog being trained (Figure 11), used to represent the concept of *discipline*, took a few moments to be interpreted by the groups. It was eventually identified as representing either *discipline* or *obeying orders*, but there was some uncertainty about what was happening in the picture. For example, some participants were unsure if the dog was being praised or punished. The image had been used in a section of a lecture about bureaucratic, rules-based management (Boddy, 2016), so the importance of the distinction between these two interpretations was minimal. In a lecture situation, there would, ideally, be no need for learners to decide what an image was designed to represent, as this would interrupt the flow of the delivery and would mean that the visual metaphor had failed in its desired purpose: to enable meaning to be unlocked in real-time. If the image's intended meaning is ambiguous or takes valuable time to interpret, then the visual metaphor itself is weak.

Figure 11

Image of a Dog and Owner Used to Represent the Concept of Discipline



The image of the doctor taking a patient's blood pressure (Figure 12), used to represent the concept of *monitoring*, caused some confusion for two groups. Their interpretations were predominantly about *medicine, doctors, illness* or *health* rather than focussing on the checking process that was being undertaken. When pressed to explain why the image did not connect with the target concept of monitoring, participants in these groups articulated that it was simply 'not clear', that it seemed vague, or that it represented some aspect of healthcare, such as treating patients. They also explained that they could not understand how this would help explain a business situation. As Moser (2000) acknowledges, contextual transfer can be difficult for learners, an issue explored further in Phase 2. This image appeared to be an example that could connect with multiple target concepts rather than one strong and dominant target concept (Memon, 2021), the latter forming a more powerful metaphor.

Figure 12

Image of Doctor Taking a Patient's Blood Pressure Used to Represent the Concept of Monitoring



Note. Image from *tomwieden, Pixabay.*

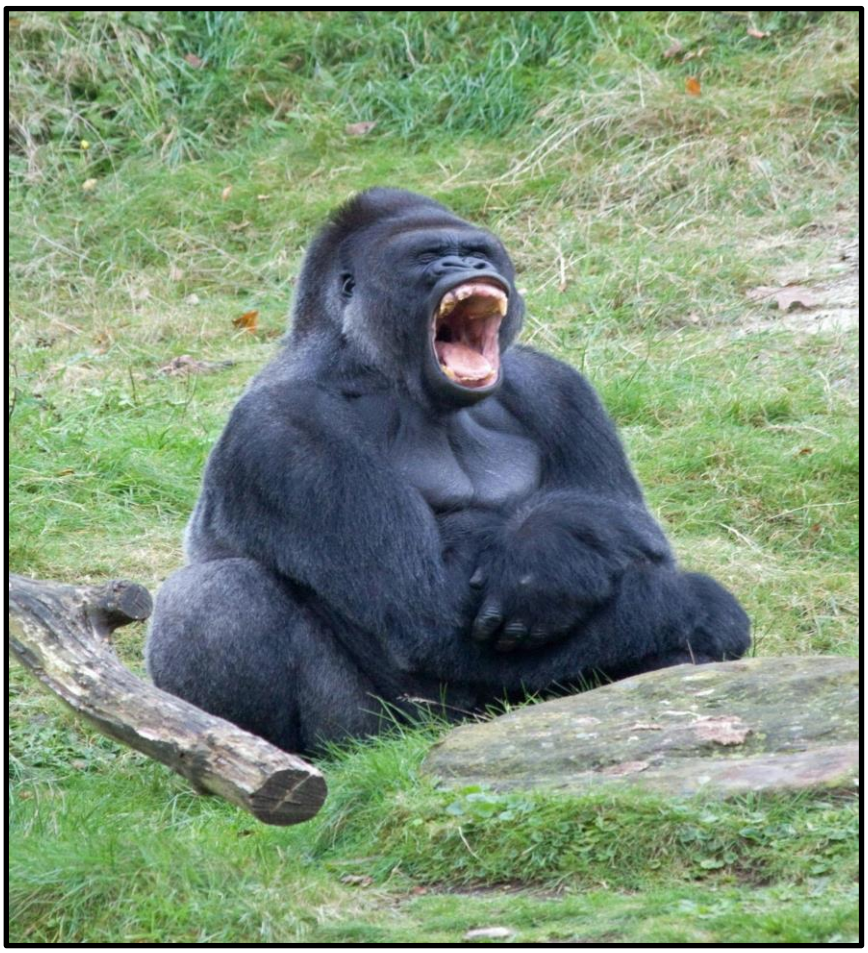
As explained in Chapter 2, a potential problem with using metaphors as a vehicle for explanation is that there is scope for misunderstanding (Carpenter, 2008). This is an important point: the power of the visual metaphor is only helpful if the target is clear and distinct. If there are multiple potential targets, or if the target is opaque, then the outcome for students may be confusion or bewilderment. Visual metaphors are most effective as an expositional tool when there is one clear and dominant target concept.

Another example of a weak visual metaphor using an animal image was that of the gorilla (Figure 13), which had been used to represent the concept of *autocratic leadership*. The intention had been to use the gorilla, in this case, a silverback, as a visual metaphor that implied dominance in leadership, a key characteristic of autocratic leadership (Boddy, 2016). Participants in two groups felt that the image was too subtle and that because the gorilla was alone in the picture, there was no representation of leadership as such. Clearly, in this case, the target concept (leadership) needed to be more evident in the image, so the impact needed to be stronger. Participants were also undoubtedly embracing the primary feature of leaders having followers that seemed so easily reflected in the image of the ducks (Figure 6).

In the final two focus groups, an alternative image (Figure 14), chosen by me, was used to replace Figure 13. Participants in these groups found it much easier to identify and explain the target concept, with this image having more meaningful features in relation to it. In this image, the silverback gorilla has others to have *authority over*. This way, the image better represents a leader and an *autocratic* scenario. This image was used as a replacement in the lectures delivered in Phase 2.

Figure 13

Image of a Silverback Gorilla Used to Represent the Concept of Autocratic Leadership



Note. Image from *hpdesign, Pixabay.*

The comparison task generated some basic but interesting data. For the first three focus groups, a pair of images was used to represent the concept of *paternalistic leadership* (Combe, 2014): kindergarten children being led along and a manager leading a business meeting (Figure 15). Participants in these three groups strongly argued that the picture of the children needed to be clearer to help with understanding the target concept; one aspect of their reasoning was that this was not relatable to business (it could not be contextualised in a business situation). This reasoning was based on the argument that the other image *was* business related and so was clearer. With the image of the children, the implication was that such an image was difficult to

associate with anything business-related, and so was a weak visual metaphor. For the second three focus groups, I replaced the image with the now-familiar picture of the mother duck and ducklings (Figure 6). Participants in all three groups regarded the latter image as clear, helpful, and easy to understand. This image was also more conducive to contextual transfer into a business situation. A participant in Group 2-3B reflected on how the mindlessness of the children following meant that the image was incompatible with use in a business context, stating: “I think the children don’t have their idea of mind – just to follow their teacher”. Reflecting on the participants' responses, I would speculate that although participants do not regard the principle of visual metaphor as childish when the image contains children, they may feel the image is inappropriate for use in an academic context.

Figure 14

Alternative Image of Gorillas to Represent the Concept of Autocratic Leadership



Figure 15

Images Used to Represent the Concept of Paternalistic Leadership



It was challenging to establish how useful a literal (business-related) image being incorporated into a slide that presented a visual metaphor was. Participant opinion was mixed on this issue; some were indifferent, some felt it was unnecessary, and a small number thought it was useful. I reflected that the juxtaposition of the two images was confusing; one or the other was acceptable, but the clarity and usefulness diminished with participants having to decide what was essential or relevant from a range of visual cues.[18]

A general conclusion is that there is no need to include two images. If the visual metaphor is strong and clear, then supplementing the representation with another image is unnecessary. This congruences with the assertion by Mayer et al. (2001) that

[18] This may represent the *coherence effect* (Mayer & Moreno, 2003) which holds that the contents of a lecture slide should be restricted to only those elements that communicate meaning.

unnecessary content should be removed from instructional materials to improve the learning experience.

4.4 Conclusion

Phase 1 provided the reassurance that using visual metaphors to communicate the meaning of abstract concepts is valuable and impactful. A typical statement was made by a participant in Group 2-3B: “Visually things are more easy to understand compared to the words”, while another participant in Group 2-2C succinctly stated, “When I see the picture it’s easy to understand the word”. The enthusiasm for animal-based images supported the view that anthropomorphism worked well as a vehicle for visual metaphor and was worthy of further investigation.

It was apparent that using a survey to collect data relating to visual metaphor use did little other than gain confirmation that students approved of them. However, some elements of the survey were useful and worth continuing into Phase 2 to gain students' academic and cultural profiles. The task-based features of the focus groups were particularly helpful in eliciting feedback from participants relating to what types of images were most and especially least useful and why. Using this task-based approach was the central development of the research methods as I moved into Phase 2.

Phase 1, therefore, enabled me to begin answering research questions RQ1 and RQ2. I was learning how to work with my students to help them articulate their thoughts on using visual metaphors and was discovering which research methods and techniques were most effective at eliciting these thoughts, and which were not. I was also beginning to understand how visual metaphors helped communicate meaning in a way that helped to enhance the learning experience. However, I wanted to push further and overcome the metacognitive issues associated with participants attempting to articulate and explain their thoughts. In Phase 2, I hoped to gain deeper insights into

the types of images most effective as visual metaphors, which were not, and most importantly, why.

Chapter 5: Stories from Phase 2

5.1 Introduction and Transition to Phase 2

The approach I decided to take in Phase 2 was informed by what I had learned about the strengths and weaknesses of the Phase 1 research methods and how to work with participants, along with some exceptionally helpful and constructive feedback following a presentation at a BERA network symposium on *Overcoming Challenges in Educational Research*. The symposium took place in October 2021, during the Autumn term in which my module was not delivered and was thus between Phase 1 and Phase 2.

In the symposium, I summarised my research, my conclusions from Phase 1, the problems I was still wrestling with in eliciting participants' explanations, and the metacognitive challenges they faced when being asked to talk about their own learning. I found the session extremely useful; as well as reassuring validatory support (McAteer, 2013) and encouragement for my research, it was suggested by the discussants (who were experienced in AR) that I incorporate tasks into my seminars where students are asked to find images to represent abstract concepts and then explain their choices. While my research mainly focused on using images in lectures, it was suggested that this exercise would help students articulate their thinking when using such images and would be a valuable, potentially original addition to the research. I decided to experiment with this approach with a foundation business group I took for seminars in the Autumn term and was reassured that it was effective as a means of generating data.

Prior to the symposium, I also obtained some valuable direct advice from a colleague (a member of my validation team) who suggested that I use *diamond nine* templates (Bullivant et al., 2022) as a way of enabling participants to structure their choices when classifying images as helpful or unhelpful. I described this approach at the symposium and was encouraged by the discussants to use the technique. In Phase 2, the main development was using *process interviews* as the principal data collection method.

This approach was built on the key strengths from the Phase 1 focus groups, the advice provided through the BERA symposium and advice from my colleague. As a further data collection method, Phase 2 used metaphor elicitation (Coulter & Zaltman, 1994) and incorporated a phased narrowing exercise (Levin & Jasper, 1995) into Cycle 4. It should be noted that in Phase 2 all seminars were taken by me; no other staff were involved in delivering the ITM course.

5.2 The Story of Data Collection

5.2.1 The Consent Form and Profiling Survey

In Phase 2, I wanted to make data collection an integral and natural part of the course. I knew from Phase 1 that data collected through formal research instruments often requires elaboration and clarification, some of which might involve speaking to a student during a seminar and asking them what they had meant by a comment in an interview or why they had chosen a particular image. In order to make the consent process less clumsy and demanding of participants' time, I developed (with the assistance of my supervisors) a consent form (see Appendix 6) that could be issued at the start of the course that would be detailed and clear enough to mean that no further, formal, consent was required. The questionnaire used in the Phase 2 profiling survey is in Appendix 21.

Before each part of the Phase 2 data collection, I clarified to potential participants that their participation was entirely voluntary, explained the purpose of my research, invited questions, and encouraged them to look at the participant information sheet (see Appendix 22).

5.2.2 Metaphor Extension Exercises

Between Week 2 and Week 6 in Cycles 3 and 4, a metaphor extension exercise was completed at the start of one of each week's two seminars; therefore, data from five metaphor extension activities was generated. As the exercises were conducted using shared Google Slides, I had a record to use after each had been completed. This data was used to supplement the TA for Phase 2.

5.2.3 Process interviews[19]

In Cycle 3, eight, and Cycle 4, twelve process interviews were held. In Cycle 3, I used three structured tasks in the interviews. Half the interviews in Phase 2 were face-to-face, and half via Zoom, the latter with participants who had chosen to complete the course online and were located abroad. The Zoom interviews were recorded using the Zoom recording feature, while the face-to-face interviews were recorded using Otter.

I produced laminated cards of the images/lecture slides for the face-to-face interviews and printed out the task templates (a time-consuming process, but one that meant that I could concentrate on the data collection). After completing each task, I took a photograph of it, ensuring that the image was labelled with the group's code name. In the online interviews, I used Google Slides that, when shared with participants, enabled them to manipulate elements similarly to the face-to-face participants. As discussed in section 3.9.6, I encouraged the participants to converse freely in Chinese - almost all were Mandarin speakers - while completing the tasks as a group, and if necessary, to seek clarification for the meaning of words, either using translation apps on their phones or by asking me.

[19] Some of the content of this section is based on the paper published in CERJ (Cotterill, 2022b). This is acknowledged in the Thesis Submission Form.

The three tasks used in Cycle 3 were as follows:

1. Twelve abstract concepts were selected (these had yet to be used in the lectures). On cards, six visual metaphors were placed alongside six concepts, with the remaining six having a non-metaphorical, business image. The participants were asked to place the cards along a *continuum of difficulty*, ranging from *very difficult to explain* to *very easy to explain*. Demonstrating an ability to explain a concept is regarded as a fundamental dimension of understanding (Wiggins & McTighe, 2005). An example of a completed task is shown in Appendix 23.

2. Ten images were selected from those used to explain concepts in lectures. Various types of images were selected (for example, involving humans, animals, static, and dynamic - all issues relevant to my research). The participants were asked to match the images with the concepts. An example of a completed task is shown in Appendix 24.

3. Nine additional images were selected from the lecture slides; again, various types were selected. Participants were asked to arrange these in a diamond nine template. The template was labelled *most useful* at the top and *least useful* at the bottom. Diamond nine exercises have been used successfully by other researchers and are helpful when participants have difficulty finding the language and vocabulary to explain their choices (Bullivant et al., 2022) or collaboration in decision-making requires dialogue between participants (Clark, 2012; Niemi, 2019). An example of a completed task is shown in Appendix 25.

In Cycle 4, an additional (fourth) task was introduced. This involved viewing four different versions of the same image (with no annotations, annotated with the name of the concept, annotated with the name of the image, and annotated with both concept and image). Participants were asked to place the four slides (see Appendix 26) in order of usefulness.

As explained in section 3.9.6, after each task, a discussion followed in which the participants were asked to describe and explain their choices. During these discussions, the focus was maintained on the outcomes of the tasks. In this way, participants reflected on their choices and decisions and were asked to explain *why* they had made them.

In seminars (prior to the interviews), students had been asked to find images to match abstract concepts. This was a basic form of *metaphor elicitation* (Coulter & Zaltman, 1994) which involved students working alone or in groups to find images that matched concepts in management frameworks being explored that week; for example, Fayol's management principles include concepts such as the highly abstract *esprit de corps* (Boddy, 2016). Examples of images that participants had been responsible for finding were brought into the process interviews as stimulus material for questioning and discussion. I wanted to know why they had chosen these images.

I had anticipated that I would experience problems when using Zoom. Because my process interviews involved a staged series of tasks, I thought this might be exceptionally difficult and clumsy to execute in an online environment. However, I found distinct advantages to taking the interviews online. While the participants completed the tasks using Google Slides, I put them in a breakout room. This meant that they could communicate fluidly in their first language and were less susceptible to response bias (Burchett & Ben-Porath, 2019) due to my physical absence. When the participants were interviewed face-to-face, despite being encouraged to speak in their first language (for almost all, Chinese), they frequently attempted to speak in English, I assume out of politeness to me. While participants discussed the tasks set in the breakout room, I could watch them complete them on Google Slides and bring them back into the main room when a task was complete. Normally at least one participant could articulate the group's answers to my questions. A group consensus was often evident, and the quality and depth of answers were often better than in the face-to-face interviews.

5.2.4 Follow-up Questions

I asked the students who had agreed to participate in Cycle 3 to answer some follow-up questions. This was because, when I read through the transcripts, there were some specific issues that I wanted to know more about. Five very direct questions were created with a focus on issues that were discussed in the process interviews (see Appendix 27). The final question was a basic alternative to the fourth task used in Cycle 4. Students were invited to participate, and answer the questions, through the Google Classroom site they used to submit written homework tasks. Two examples of participant responses are shown in Appendix 28.

Seventeen students agreed to participate, most of whom provided practical, detailed explanations. These were inevitably some of the more enthusiastic students, but their insights were valuable. The explanations were coded and used to help build the themes in the TA. Since participants had more time to think and reflect, some thoughtful responses were provided, several of which provided valuable quotations. I did not use follow-up questions in Cycle 4 as I had identified areas that needed addressing and included these in the revised interview planner.

5.2.5 Phased Narrowing - Finding Better Images

As a coda to Cycle 4, I decided to ask my students to participate in an exercise to find replacement images for those deemed ineffective through the Cycle 4 research process. I selected ten images that participants in the Phase 2 process interviews were most critical of.

The exercise employed *phased narrowing* (Levin et al., 2000; Levin & Jasper, 1995). The purpose was to allow participants to suggest better images, to enable group discussion of the suitability and merit of choices, and to move through a four-stage decision-making process. I was conscious that my students had been extremely generous with their time over the term; I emphasised that participating in this exercise

was completely voluntary, that it was part of my research and not part of their course, and that they should therefore feel no obligation to contribute. However, there was a high level of participation; this was perhaps because the starting point of the exercise was based on the information drawn from interviews with these students. For them, this was the final stage in the research journey, and they wanted to be part of it. The strengthened relationship that I had built with them through the research process may also have been a factor in determining the high level of enthusiasm that they had to participate.

The four stages of the phased narrowing unfolded as follows:

Stage 1: Students were given an electronic document with the ten images in it, along with a statement of what the image was meant to represent and some brief details of why the image was roundly regarded as weak in terms of supporting understanding (see Appendix 29). They were invited to find (at least) replacements for six images and asked to provide a brief justification for their choices.

Thirty-three students collectively submitted 271 images. Almost 50% of participants submitted ten images, despite being assured that six were sufficient. This again is an indicator of the participants' enthusiasm.

Stage 2: A member of my validation team had worked extensively in media art. With her help, I filtered the 271 images, removing any that made no discernible connection with the concept. Where there were several similar images, we used our judgement to choose the most impactful one (often because of its clarity or simplicity). Any images for which a legally permissible version could not be obtained were removed; for example, a photograph from a movie. In order to ensure that participants had sufficient choices for the final stage, the number of concepts was reduced to eight, with six possible images for each (see Appendix 30).

Stage 3: At the end of seminars, in groups of three, participants were asked to choose their three favourite images - the most impactful ones - and rank them from 1 to 3 (1

for their favourite from the three). About twenty minutes were required for group discussions and the selection process. I then allocated three points for each 1, two for each 2, and one for each 3. By adding up the scores, I could narrow down the choices and select the image that seemed to be most popular using this semi-democratic system. Twelve groups of students participated in this exercise. Again, the participation was enthusiastic. The results are shown in Appendix 31.

Stage 4: Finally, the eight images selected through stages 1 to 3 were shared with the entire cohort. I did this using a Google Form and invited participants to submit comments that might help me to understand why these images were selected as the most impactful. I had not anticipated many contributors as this was near the end of the course, but twelve participants provided explanations - some very perceptive and thoughtful - that were used to supplement the other data from Phase 2. Examples of participant comments are shown in Appendix 32.[20]

5.3 Analysis of Data Collected

5.3.1 The Consent Form and Profiling Survey

In Week 1 of Cycles 3 and 4, the participants' consent form was distributed, along with details of the nature and purpose of my research (see Appendices 6 and 22). Surprisingly, all 56 students in the cohorts agreed to participate in the research. This meant that I did not need to ask for written consent again. Before each element of data collection I did, however, verbally remind the students that their participation was voluntary and of their right to withdraw.

In Week 2 of each cycle, I distributed the much-simplified profiling survey. 88% of the students in the cohort completed it of whom 90% had undertaken their undergraduate

[20] For the purpose of this exercise, and being mindful that I wanted to incorporate these images into my instructional materials, similar (or identical) images to those selected by participants were found through Shutterstock.

studies in Mainland China with a further two completing their studies in the autonomous Chinese region of Macau. 65% held an undergraduate degree in a business/management/accounting/economics related field. I knew from the entry data that 93% of the cohort were Chinese.

5.3.2 Thematic Analysis

TA was used to analyse the data collected through the process interviews, supplemented by the answers to the follow-up questions and the phased narrowing data. Unlike in Phase 1, the Phase 2 transcripts were much better quality, a feature that can be attributed to the tighter and more focused structure of the discussions in the process interviews. The process undertaken, which broadly followed the steps outlined in section 3.13.2, is concisely summarised as follows:

1. The recordings of the process interviews were transcribed. This was a slow process, taking approximately thirty hours to complete, but was eased by being able to refer to the completed tasks; this enabled what was being said to be contextualised. The immersive and highly focused process of slowly working through the transcripts helped me to gain familiarity with the data and to begin thinking about possible codes. Reissman (1993) argues “analysis cannot be easily distinguished from transcription” (p. 60), which was apparent for me as I carefully listened to the recordings; I was beginning to think about the meaning of the data and to see patterns within it.

2. The transcripts were reread through twice, and, where necessary, edits took place by using the original recordings. The aim was to provide an authentic representation of what was discussed by, as far as possible, creating a verbatim transcript of what was said (McMullin, 2021). This inevitably meant there were some long sections of the transcripts that would not be suitable for coding as they included irrelevant or peripheral discussion between the participants and between the participants and me.

3. The transcripts were coded. Both latent and semantic coding was used, a flexible approach advocated by Braun & Clarke (2006). This meant that some codes were simple identifications of points made by participants (semantic codes) while others were my interpretations of hidden or intended meaning (latent codes). There was not always a clear distinction made.

4. Once this task was complete, I read through all the transcripts and other data again and checked the codes' wording. Where possible, I attempted to move towards a more homogenised wording for the codes (e.g. 'characteristics of animals are familiar') while ensuring that I did not manipulate the meaning or erase the contradictions and differences of opinion that were inevitably present. As I worked through this process, I began to group codes into what would become themes. The maps of the codes are shown in Appendix 33.

5. I then used the codes and maps to begin creating the main themes from the data, along with sub-themes classification based on images being helpful or unhelpful. I read through the data again and, using highlighter pens, initially categorised codes as being either: factors that were positive, factors that were negative, cultural factors, and factors related to the use of metaphor elicitation. The categorisation was reorganised more logically into five main themes, along with a further theme to cover metaphor elicitation. These are summarised in Appendix 34.

6. Finally, I worked through all the data again, a fourth reading, adding extra codes in places and looking for potentially valuable quotations. Codes were highlighted to classify them under the five main themes and then further categorised under the two subthemes (helpful or unhelpful).[21] As I completed this process, I created a record of the location of codes and noted where

[21] Appendix 34 shows the colours used to markup the transcripts with each theme. The semantic and latent coding comments were highlighted to categorise them under the five main themes. The comments were further classified as being either helpful or unhelpful.

potential quotations could be found. The code location summary is in Appendix 35.[22]

Four transcript extracts are shown in Appendix 36. These extracts show examples of latent and semantic coding.

The following analysis is structured under the six main themes developed through the TA. The analysis is supplemented by data collected through the follow-up questions, metaphor elicitation, metaphor extension exercises and the phased narrowing exercise.[23] The subthemes were deductively applied to these other sources of data to identify relevant material and examples. The volume and quality of data collected from the process interviews felt sufficiently strong to direct the analysis in this direction.

Theme 1: Familiarity and Relatability of the Source Image

One of the most important reasons why certain images were regarded as being helpful to gaining an understanding of a concept was if they were *familiar* and *relatable*. In 18 of the 20 interviews the issue of the image being familiar and relatable was discussed in some form, the word 'familiar' often being used to explain why an image had meaning. These two factors are important for ensuring that an image is accessible and useful as a source domain. If a learner is unable to appreciate the characteristics and features of whatever is included in the selected image, then it will be difficult or impossible to unlock the meaning of the target concept (Carpenter, 2008). As participant Q4 stated, for meaning to be found it is important to have a "high associative or personal connection".

[22] The extra number after the group code indicates the page number in the annotated transcript where the relevant material is located. For example, 4-3A-7 indicates cycle 4, group 3A, page 7 of the annotated transcript.

[23] I was also able to seek informal verbal clarification from my participants. This was extremely useful as a means of strengthening the quality of my latent coding - I was able to informally ask participants to clarify the meaning of their contributions.

Familiarity and relatability have subtle differences. Familiarity concerns the image being one that learners have seen before, or rather have seen something *similar* before. Familiarity equates with recognition of, and connection, with the image. There is an argument that images representing events that observers have real-life perceptions and experiences of will resonate more powerfully with them (Conway, 2001), particularly when such images connect with an emotional experience (Holmes & Mathews, 2005). The ability to empathise with a situation may add further connection to a metaphor (Grisham, 2006). The purpose of the source domain is to make understanding of a complex or abstract target domain easier, so expecting learners to determine what the image is, or requiring them to decide what the most salient features of it are, defeats the point of using it.

Relatability concerns the ability of the students to connect the image with their own life experiences and knowledge. This pushes beyond familiarity; students may make connections with memories, feelings, emotions or personal experiences. As McNiff and Whitehead (2009) explain, “Meaning and experience are integrated, each part containing the other parts, and each part capable of making new meanings from and with other parts” (p. 41). These connections can help to construct new understanding or perspectives (Schön, 1979). Building relatability into instructional design will arguably improve relevance and “enhance cognitive performance” (Means et al., 1997, p. 5) by lowering the obstacle between the learner and the source domain in the metaphorical construction. Removing this obstacle should increase the speed and effectiveness with which new information is processed.

In the phased narrowing exercise, the theme of familiarity appeared frequently. For example, when explaining why they thought the image of the rock climber (Figure 16) was selected through the phased narrowing exercise as the most suitable image to represent *challenge*, half the participants expressed a view that stated or implied that there was a high level of familiarity with the *difficulty* of rock climbing. Similar comments were made by most participants about the CCTV image (Figure 17), chosen through phased narrowing to represent *monitoring*, with several participant comments describing the image as ubiquitous, possibly reflecting the situation in China where

CCTV is used extensively by the authorities to monitor the movements of the population (Qian et al., 2022). The image of the crown (Figure 18), selected to represent *power culture*, again through the phased narrowing exercise, was described as being “obvious”, “simple” and “easy to understand” by participants.

Figure 16

Image of a Rock Climber Selected to Represent the Concept of Challenge

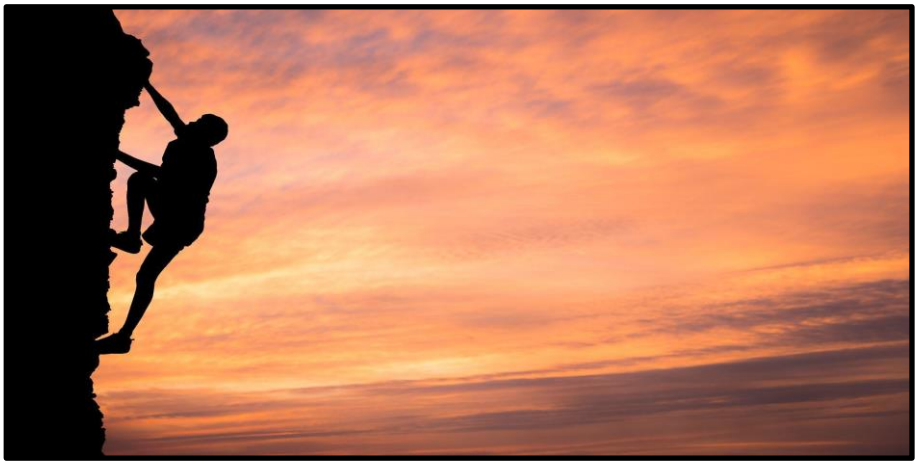


Figure 17

Image of a CCTV Camera Selected to Represent the Concept of Monitoring

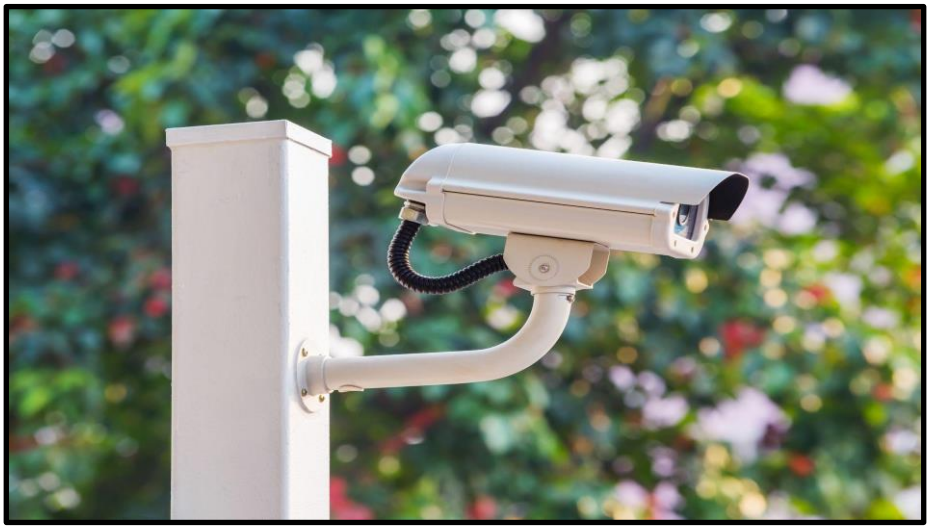


Figure 18

Image of a Crown Selected to Represent the Concept of Power Culture



Through the four Cycles of the research, it became clear that animal-related images had particular resonance with participants. As discussed in section 2.12.5 humans enjoy animal anthropomorphism and often express relatability with animals, whether real or imagined (Epley, 2018). To achieve relatability and familiarity, learners need to be aware of the characteristics and behaviours of the animals in the pictures. Furthermore, being able to relate to these, in the sense that they can be connected to human behaviours and characteristics, is essential. A participant in Group 4-3A explained how animal choices should be made based on how knowledgeable the target audience is likely to be of the characteristics of that animal. This assertion acknowledges differences in the ways in which a target audience locates familiarity and relatability.

The image of the tortoise (Figure 19), used to represent being *slow and inflexible,* was an example of a highly relatable source. In almost all interviews it was placed in the

top three images in the diamond nine task. When questioned about this choice, participants asserted that the most important and obvious feature of tortoises is that they are slow, pushing this adjective to the forefront of their thoughts. When I convened a workshop of action researchers at the ARNA 2022 Conference, I displayed the image of the tortoise and asked attendees to submit, via Mentimeter, an adjective that came to mind when they saw the image. In the word cloud that I created and displayed, based on the contributions of the attendees, the dominant word was *slow*, with a very small number of attendees submitting related adjectives such as *tired* or *contemplative*.

The image of the bees (Figure 20) was also regarded as one of the most useful visual metaphors. In ten interviews, participants emphasised how this image was familiar to them, and was thus easy to interpret in terms of its intended message (*teamwork*). As a participant in Group 4-1B explained, bees can form a strong visual metaphor because, “Everybody knows that bees are working together animals, so this shows that… The picture and the word is well matched”. Or, as a participant in Group 4-1C stated, “And the bees, all the bees are working so it makes sense - everyone contributing”, while another participant in this group added “We know worker bees’ behaviours, so we understand, we clearly understand the work they do”. At the ARNA 2022 workshop I used the Mentimeter traffic light response option to gain feedback from attendees as to how effective they thought examples of visual metaphors might have been perceived as being by my participants. When I displayed the image of the bees, 60% of attendees chose green (a strong visual metaphor) and 40% selected amber (neutral).

Figure 19

Image of a Tortoise Used to Represent the Concept of Being Slow



Figure 20

Image of Bees Used to Represent the Concept of Teamwork



An example of an animal image that was not familiar to most participants was that of the penguins (Figure 21), used to represent the concept of *subculture*. This was an

unpopular choice in the diamond nine exercise, being placed in the bottom three by most groups. While some participants were confused by the target concept, for many the lack of familiarity with the behaviours and characteristics of penguins was a source of confusion. The image of the flock of birds, used to explain the concept of *shared values*, was similarly unfamiliar to participants. Perhaps for those who live in large urban areas such as Beijing, where interest in observing birds is less common (The Economist, 2021), it is unfamiliar and unrelatable. A participant in Group 3-4A explained that this was a distinct possibility for such students, who would be unfamiliar with the behaviour of flocks of birds. A participant in Group 3-6A innocently asked whether birds flying like this, with no clear leader, was a uniquely British phenomenon as it was not something they were familiar with.

Figure 21

Image of Penguins Used to Represent the Concept of Subculture



The familiarity and relatability of animals was explained by a participant in Group 4-2A as being associated with animals that they were interested in as children. Watching television programmes in which animals were anthropomorphised built an *assumed understanding* of the characteristics and behaviours of certain animals. This is a subtle, but potentially influential factor in determining whether an animal has familiarity and relatability, or not, and reflects the suggestion put forward by Small (2016), that depicting animals in cartoon form is particularly effective at fostering connection with those animals.

Some images were culturally inaccessible or ambiguous, thus rendering them unfamiliar (Lu et al., 2019). For example, an image of the British royal family (Figure 22) had been used to represent *stakeholders*, the diversity of objectives, and conflicts between them (Boddy, 2016). I had several conversations with my students at the start of seminars in which they had expressed an interest in the royal family and their conflicts, something that was being widely reported at the time in the media. However, the image was unanimously described as confusing, the primary reason for this being that participants regarded the royal family as the official leadership of Britain; as such the term stakeholders confused them and concepts such as *leaders* and *power* seemed more obvious target domains.

Through the phased narrowing exercise, a replacement image of a photograph of world leaders sitting at a table during an international summit (Figure 23) was chosen by participants. This replacement seemed to resonate with most participants, who commented on the difficulties of reaching agreement when representatives were drawn from a variety of different, and diverse, countries. This image may also be more powerful because of its suitability for contextual transfer (Theme 4), as the image of a meeting of world leaders has many similarities with a meeting of business leaders.

Figure 22

Image of the British Royal Family Used to Represent Stakeholders



Figure 23

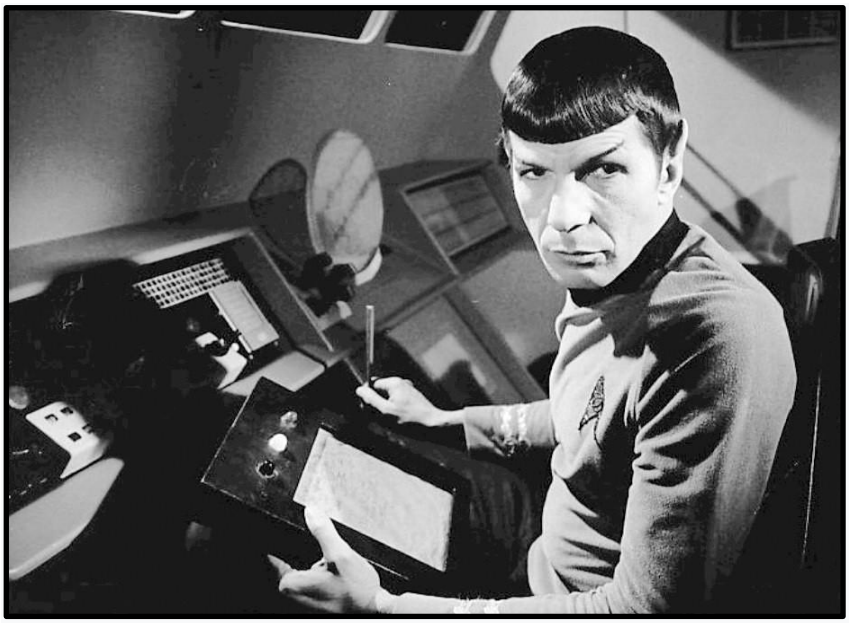
Image of World Leaders Selected to Represent Diverse Stakeholder Interests



Another example was both culturally, and generationally, inaccessible. I used the image of Mr Spock, from Star Trek, to introduce the concept of *rationality* (Figure 24). Very few participants had any familiarity with this character. However, interestingly, several said that they had taken the trouble to find out more about him following the lecture in which the image was used. Participants in Group 4-2C thought that he appeared to be a captain of a spaceship, a reasonable assumption, which meant that a more appropriate target concept would be *leadership*. Through the phased narrowing exercise an image of a robot (Figure 25) was the most popular choice to represent rationality; as participant PN1 stated in their final comments, "The word *rationality* gives the feeling of no emotion and behave only with logic, the picture of robot seems well explaining the concept" while participant PN8 stated perceptively that, "A robot's mind is designed through computer programming and does not have any self-initiated emotions, so it is completely rational".

Figure 24

Image of Mr Spock Used to Represent Rationality



Note. From *Leonard Nimoy as Mr Spock* [Photograph], between 1966 and 1969. Wikimedia Commons. https://commons.wikimedia.org/wiki/File:Star_Trek_Spock.jpg

Figure 25

Image of a Robot Selected to Represent the Concept of Rationality



The image of a tyre pressure gauge (Figure 26) being used to represent *monitoring* was regarded as confusing because, many participants explained, they were unfamiliar with the act of measuring the tyre pressure of cars. When this image was used for the traffic light exercise at the ARNA 2022 workshop (see Appendix 3), although 50% of attendees regarded the visual metaphor as strong, 33% regarded it

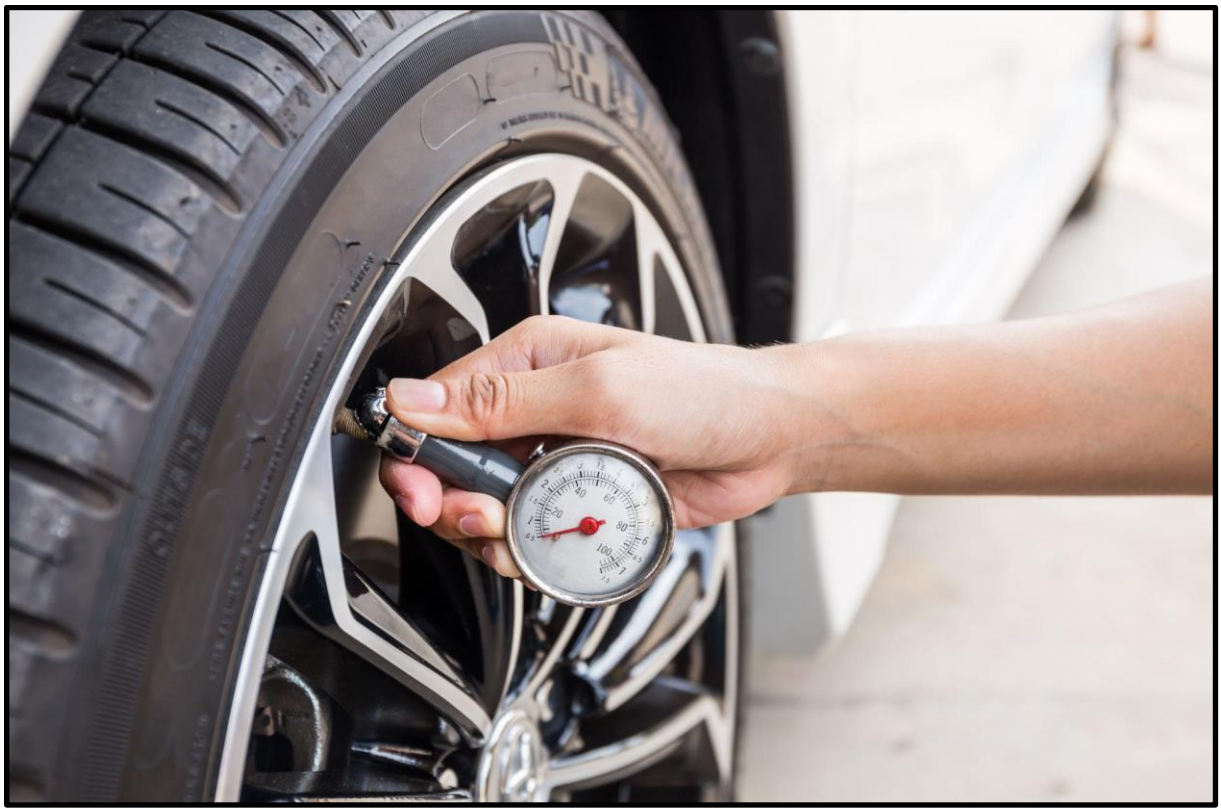
as neutral, and 17% as weak. Despite this being a more *mature* group of participants, some of them also questioned whether the image and its related meaning would be widely understood, concurring with the view of the interview participants.

A participant at the ARNA workshop, a high school teacher and action researcher, recognised and reflected on the significance of this issue but felt that some level of difficulty was an important part of the process of learning through visual metaphor. He stated in his feedback that:

> The meaning of the source images should not be too obvious. More than simple source images may lead to boredom for the learner. Reduces interest in learning. Appropriate source images allow students to discuss and make it easier for them to gain a deeper understanding.

Figure 26

Image of Tyre Pressure Being Taken Used to Represent the Concept of Monitoring



This reflects an awareness of the balance between something being so obvious that it is boring, but interesting enough to gain the interest of the learner and to stimulate discussion. As Memon (2021) implies, some cognitive effort may make the process of metaphor interpretation more compelling. Schön (1979) uses the term "generative metaphor" (p. 137) to describe those that actively challenge and help create fresh perspectives. I would suggest that more experienced learners are more open to the use of generative metaphors than more inexperienced learners. The image of a CCTV camera (Figure 17) was chosen by participants in the phased narrowing exercise as a more familiar alternative to the tyre pressure gauge.

The degree to which familiarity and relatability are important is contextual. During the question-and-answer session following my workshop at the 2022 ARNA Conference, this issue was raised. The audience was composed of experienced academics, researchers, and doctoral students. The consensus from the group was that if visual metaphors were being used in the context of delivering material to novices or younger students, then familiarity and relatability would be extremely important for them to benefit from the use of a visual metaphor. However, they argued that when the target audience was more experienced or mature, a lack of complete familiarity might be useful as a way to pique curiosity and engage deeper thinking. This significance of the target audience was recognised by a participant in Group 3-1A who concisely described how image choice "depends on which kind of person you are talking with".

The above conclusions align with previous research into metaphor use that has indicated that if a metaphor does not resonate with the recipient of the information, the impact is weak. An example of this is provided in a study by Ottati et al. (1999) who considered the impact of the language used to motivate students. They found that sporting metaphors (such as 'play ball') were less impactful when persuasive language was used with non-sporting students than with those who were sporting. As Dutton (2020) concludes: "metaphors, it would seem, are like dentures. They're only good if they fit" (p. 255). Selecting visual metaphors that are familiar and relatable is essential if they are to have the desired impact.

Clearly, familiarity and relatability cannot be ubiquitous. However, it is important to consider the background of the target audience when selecting images. Familiarity and relatability are fundamental to creating a strong visual metaphor.

Theme 2: Comparison Between Source Image and Target Concept

As explained in section 2.9, according to CMT, metaphors involve a target and a source domain (Lakoff and Johnson, 1980). It was apparent from the interviews that for a visual metaphor to be effective there must be a strong and clear connection between the image (the source) and the target concept. When most effective, this connection is characterised by being clear and unambiguous.

When images were regarded as most helpful, the comparison was easy to recognise and elicited thoughts on the similarities mapped between the source and target domains. As participant Q2 explained, when reflecting on what characterises effective visual metaphors, “I personally think that the main feature of visual metaphors is that people can directly understand the general meaning of what they want to express through pictures”. This *directness* implies the requirement of a strong and easily understood comparison mapping between target and source, without any deep cognitive processing required to identify the connection.

Directness and simplicity may be a feature that is of particular importance to novice learners who face greater cognitive obstacles than more experienced learners, who may even enjoy finding the link (as also discussed in Theme 1). When I made a presentation at a 2022 Advance HE conference, delegates expressed pleasure at attempting to decide precisely how I was using visual metaphors that had been largely used as decorative features of the presentation. An example of such an image was the multiple layered sandwich (Figure 27) that was placed on a slide summarising the *layered* feature of the process interviews.

Images were regarded as less helpful by participants when the comparison mapping was not clear or was ambiguous. Weakness was also caused by there being multiple possible targets. As Participant Q7 argued, “It is necessary to choose metaphors with only one meaning as much as possible, and avoid metaphors that can be understood from different meanings”. Other participants also indicated a preference for the visual metaphor mapping against one distinct and identifiable target domain, or as participant M2 stated, “Sometimes a single picture could have different meanings which is confusing. Pictures showing a specific situation may be helpful for students to get the points”.

An example of an image for which a strong and clear connection could be made was that of the roulette wheel (Figure 28), used to explain *business risk*. In almost half of the process interviews this was identified as an image that could easily be connected with the target concept. As a participant in Group 3-3A, albeit rather clumsily, explained, “That is why, like gambling, because you have a lower chance of winning, as in certainty when you’re gambling all the times. I think it could be matched with… doing business”, while a participant in Group 4-3B similarly asserted that, “business sometimes just like gambling. We cannot guarantee fabulous outcomes. You will have risk. Just like gambling”. One domain being *like* another domain encapsulates the principle of a strong metaphor (Heath & Heath, 2007).

Other images that were regarded as strong visual metaphors included the surgeons (Figure 29), used to represent *teamwork*, and the chess game (Figure 30), used to represent *strategy*.

Figure 27

Image of a Sandwich Used to Represent the Layered Features of Process Interviews



Figure 28

Image of a Roulette Wheel Used to Represent the Concept of Business Risk



Figure 29

Image of Surgeons Used to Represent the Concept of Teamwork



Figure 30

Image of a Chess Game Used to Represent the Concept of Strategy



With both these images, many participants explained how there was a clear connection between the image and the target concept. Typical arguments as to why revolved around the surgeons being compelled to work together to save someone's life, and that without strategy it was almost impossible to win a game of chess. This issue was discussed by other participants who used terms such as 'point of reference' to describe what was needed for an image to be easily connected with the target concept. I understood this to mean that there needed to be features in the image that were understood as representing something in or of the target concept. It was implied by other participants that strong associative connections were important to help find meaning. Of course, it could be argued that in the case of the surgeons the image is not metaphorical at all, but simply an example of teamwork. However, it must be remembered that the concept was being transferred into a different context, that of business and management (discussed in Theme 4). The context in which the comparison is being made may also be a factor. Tversky (Lewis, 2016) emphasised how the strength of metaphorical comparisons could be context-dependent. For example, two US citizens in the US are unlikely to be perceived as being as similar as two US citizens in another country.

In Cycle 3 an image of a group of dogs (Figure 31) was used to represent the concept of *control* (of a group). This caused some confusion in terms of the connection with the target concept. A participant in 3-2A explained that "For me it's like racing, because those dogs are different shapes and maybe they're like have a race or competition for their fur or something". In Cycle 4 I substituted an image of police officers (Figure 32), although this also proved to be problematic in terms of establishing mapped connections. Over half the interview participants had placed the image in the bottom three choices in the diamond nine, arguing that the image could have other meanings. It was asserted that these alternative targets could be related to the police officers not controlling but protecting, defending, or preventing problems. Several participants explained that, in China, perhaps contrary to western assumptions, the police are generally very friendly and would not be regarded as a force for control. The perception of the police seemed to be that they keep the population safe. A participant in Group 4-3A explained his confusion: "Because when I see these cops, I only think security.

I’m not sure what they’re doing. Maybe defending the yard behind them, or they may be facing some, you know, people”. Other participants pointed out that in order to be used to represent control, the image would need to include something *being* controlled. This latter issue of what elements are included in the image is discussed in Theme 3. Through the phased narrowing exercise a replacement image of puppets, or marionettes (Figure 33), was selected by participants. Participant PN8 eloquently explained why this was a suitable choice by describing how *control* governs their actions:

> Marionettes are puppets whose hands and feet are completely tied, which means that every step they take and every movement they make is manipulated by the other end of the string. Their eyes are closed, and they don't need to think or know what to do next.

Figure 31

Image of Dogs and Handlers Used to Represent the Concept of Control



Figure 32

Image of Police Officers Used to Represent the Concept of Control



Figure 33

Image of Puppets Selected to Represent the Concept of Control



The image of the blind person and the guide dog (Figure 34) divided opinion. This image was used to represent *trust in authority*. Although some participants thought the image was striking and powerful, many argued that the directionality implied by the image was ambiguous. It did not seem unanimously clear who was trusting who: was the dog relying on the owner, or the owner relying on the dog? This lack of directionality weakened the strength of the visual metaphor. A participant in Group 4-1A argued that the dog could be a pet or could be interpreted as such by students who lack familiarity with such an image (see Theme 1). A participant in Group 4-1D provided another reason why the usefulness of the visual metaphor was weak: “Because we can’t get the information about the people from the picture. We can’t see she or he is blind, so we don’t know it’s a guide dog”. The issue of directionality in metaphor use has been discussed by Tversky (Lewis, 2016) who emphasised that many powerful metaphorical representations have a particular direction. For example, someone may say that their love for another is ‘as deep as the ocean’, not that ‘the ocean is as deep as my love’. Some visual metaphors may be constrained by somewhat similar directionality issues.

The confusion with the image in Figure 34 was probably related to the fact that in the UK encountering a blind person with a guide dog is common. In China, guide dogs are far more unusual (Gan, 2020) and blind people, despite progress being made in recent years (Dauncey, 2020), are often not part of mainstream society (Sizhuo, 2019). The lack of familiarity with this image compounds its unsuitability as a source domain.

Figure 34

Image of a Blind Person and Guide Dog Used to Represent the Concept of Trust in Authority



Directionality was also an issue with the image of the birds and the ox (Figure 35) introduced in Cycle 4. The birds were intended to represent the *value of subordinates,* but this seemed to be unclear from the image, weakening the connection. A participant in Group 4-3C explained how it was not apparent who was the subordinate, the birds or the ox, an opinion echoed by participants in two other groups. This made it difficult to decide how the image connected with the target concept. It also seemed apparent that the idea of symbiotic animal behaviour was unfamiliar to many (see Theme 1).

An issue discussed in several interviews was the degree to which a comparison requires explanation or clarification. In other words, when the lecturer is presenting an image as a visual metaphor, do they need to explicitly indicate the mapped

connections between source and target, in the way that Glynn et al. (2007) recommended? One participant (Q2) articulated when an explanation might be needed: “Because people cannot get the information of the target word from the pictures, or the pictures are too abstract and obscure”. The issue of whether sufficient information is presented in the source image is discussed in Theme 3. It was generally agreed that, if the connection needed to be explained, it would defeat the purpose of using that particular image. It was thought by most participants that it would make gaining an understanding more difficult. Providing explanations would also interrupt the flow and pace of an exposition.

Figure 35

Image of an Ox and Birds Used to Represent the Value of Subordinates



Another example of where the connection seemed weak was the image of the horse and rider (Figure 36), used to help explain the concept of *influencing*. Most interview groups in Cycle 3 placed this image in the bottom three choices in the diamond nine exercise; the image was so unpopular that it was replaced in Cycle 4 by another. Many participants explained how they were simply confused as to how the source and target domains were linked, as the image did not seem to indicate any mapping. Participant Q6 described the problem with this image as being that it, "seems to deliver ambiguous information, it can stand for various meanings like competition, work-life balance, etc., doesn't have a uniform understanding". The assertion reaffirms the potential problem with a visual metaphor for which there are multiple potential target domains.

Through the phased narrowing exercise participants selected a replacement image for Figure 36 of dominoes being toppled over (Figure 37). Participant PN2 provided a clear justification for this being a popular choice as, "The characteristic of domino is that as long as one moves, the others will fall. So, this picture shows how influential it is". The connection between the source and target domain is clear and unambiguous.

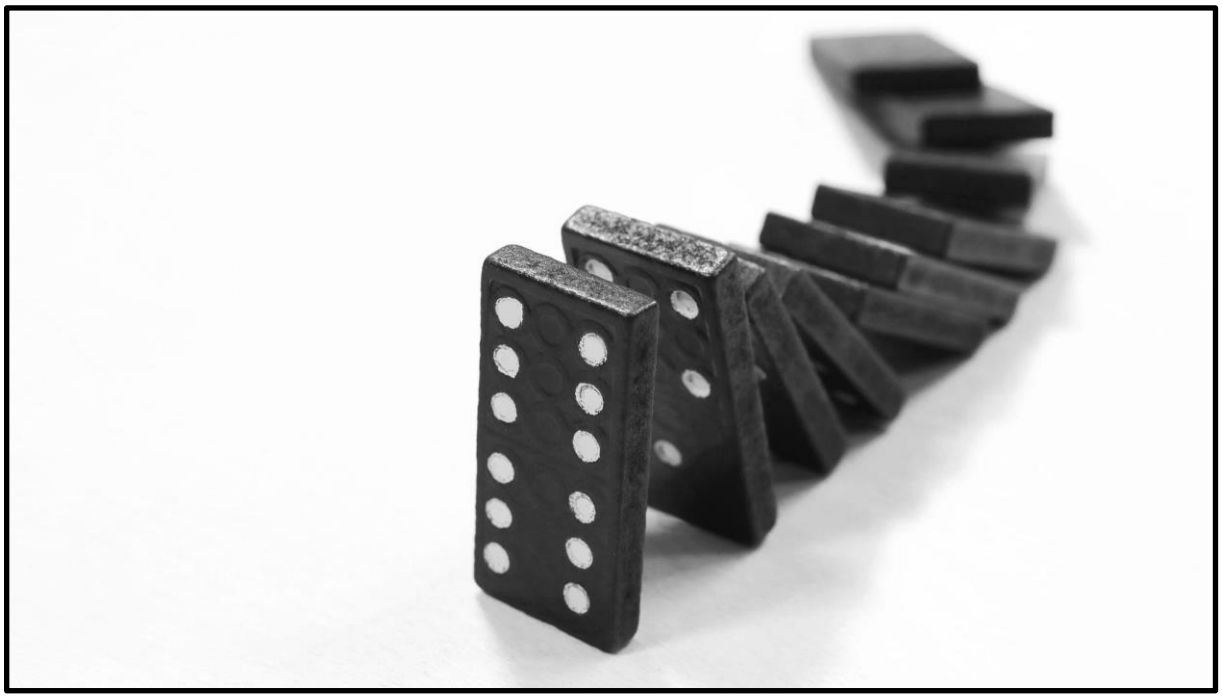
Figure 36

Image of a Horse and Rider Used to Represent the Concept of Influencing



Figure 37

Image of Toppling Dominoes Selected to Represent the Concept of Influencing



Through the four Cycles of the research, it became apparent that animal images were considered particularly useful for suggesting connections between domains. As discussed in section 2.12.5 the allure of anthropomorphism means that animals have particular appeal and, as explained in Theme 1, their familiarity and relatability also strengthen their suitability for use as visual metaphors. Several discussions in the interviews centred around the way in which animals have behaviours and characteristics that are comparable with humans or simply that, as a participant in Group 3-2B asserted, the images are often "lovely". However, animals may have a narrower range of features or (as with the tortoise image) have one dominant feature (slowness in this case). An image being animal rather than human-based might also promote deeper thinking and potentially generate more enthusiasm and interest in making sense of the concept. As a participant in Group 3-1B explained:

> Well if you just put a man or people on a picture it feels like it's too direct, you just don't think, you just see the image and, you know, OK this is just a bunch

> of businessmen doing their job, communicating. But if you… put the ducklings and the mother duck and the picture like this one, you might think, oh that's interesting, and you would… You actually would look even more detailed somehow this picture, because we… probably it's the… the enthusiasm of people - we love animals, do we pay more attention to the picture.

Participants in Group 4-1C argued that the way in which we can empathise with animals makes them suitable for creating strong metaphors, logically reasoning that this is because humans are also animals. Animal images are seemingly more interesting to look at and may be better for gaining the attention of a learner than a simple business-based image.

There are limitations to the use of animal images. Not all characteristics of human life can be compared to animals and their interactions. For example, in Group 4-3B a discussion took place about using animal images as visual metaphors for aspects of culture. Participants argued that this was confusing as animals do not have cultures. While some would argue that the animals do have cultures, these are generally regarded as being less sophisticated than human civilisation (Whiten, 2021). This reflects the argument put forward by Pashler et al. (2007) that fostering an opaque, abstract concept (such as culture) is best grounded in a well-understood concrete concept.

The image of the fairground bumper cars (Figure 38) was used to represent the concept of *turbulence*. Opinion was divided on whether this was a helpful and clear image. Of those in the interviews who expressed an opinion, slightly more than half argued that the source and target did not connect. Their reasoning was that bumper cars were associated with having fun (the dominant emotion was *enjoyment*), and turbulence was associated with unpleasantness or distress. A participant in Group 4-1C emphasised how enjoyable the experience of driving a bumper car is, and how the enjoyment is "embodied", a term used when describing metaphors related to bodily experiences (Anderson, 2018). Despite this, the familiarity of the image had appeal for

others, with a participant in Group 3-1B arguing that the image was especially powerful and “vivid”.

It is the mapping between the source and target that is fundamental to this facet. Willingham (2023) argues that understanding is strengthened by keeping the “focus on the mapping. The mapping is the pairing of the features of the *something you already understand* with the features of the *something you are trying to understand*” (p. 57). Eppler (2006) asserts that it is essential for the visual metaphor to have “a strong and clear association that is related to the conceptual domain that is mapped” (p. 203), while Coyne (1995) argues that the teaching power of a visual metaphor is most effective when the image has direct appeal to the learner.

Figure 38

Image of Bumper Cars Used to Represent the Concept of Turbulence



Theme 3: Source Image Type, Content and Aesthetics

This theme concerns the suitability of the type of image chosen as a visual metaphor. In other words, the extent to which the visual source is strong or weak in relation to what it is and the *elemental contents* of the image or its aesthetics. Many different reasons were given for why images were strong or weak as sources, although when expressing positivity, images were often described as ‘powerful’, ‘helpful’ or ‘interesting’. As one participant (Q16) asserted, such images “will give a strong impression of the metaphorical concept”. By drawing on the learner’s limited attention reserves (Oakley, 2017), an impactful image is seems more likely to be processed as a visual metaphor and thus lead to the target concept being understood. This was apparent in the way that many participants who explained why they liked the use of particular visual metaphors used words related to speed (such as ‘quick’ or ‘fast’) as adjectives to describe how their understanding was achieved.

An issue discussed in many process interviews, although with varying degrees of complexity, was the number of elements present in an image. Conciseness and content clarity was essential to make images suitable and meaningful choices. Participant Q16 described the characteristics suitable images should possess: “The pictures have one and only one obvious and prominent characteristic and this characteristic has something in common with the concept”. This implies a preference for one dominant feature in the image: a strong primary metaphorical source that is easy to understand (Burkhard & Meier, 2004). The word “prominent” captures this by indicating that the image should have one characteristic or feature that is more dominant than any others. The example of the tortoise, discussed under Theme 1, is an example of this. By contrast, participants in Group 4-2A thought that the image of the elephants (Figure 39), which was used to represent the concept of *social relations,* was a weak visual metaphor because there was an insufficient number of animals to indicate a social situation; it simply appeared to be a small family, which was the dominant representation from the image.

Figure 39

Image of Elephants Used to Represent the Concept of Social Relations



An interesting discussion took place in Group 3-2A about the image of the spider in the web (Figure 40) to illustrate *power culture* (Combe, 2014). Participants felt that elements were missing from the image. They argued that the spider could not be seen as exerting power over anything alone. If another insect was present in the image, this could be used to show that the spider has power over it, strengthening the visual metaphor. The problem here was similar to the issue with the image of the police officers (Figure 32) and the gorilla image (Figure 13). These images were *incomplete* in terms of the information they needed to provide to form strong visual metaphors.

Figure 40

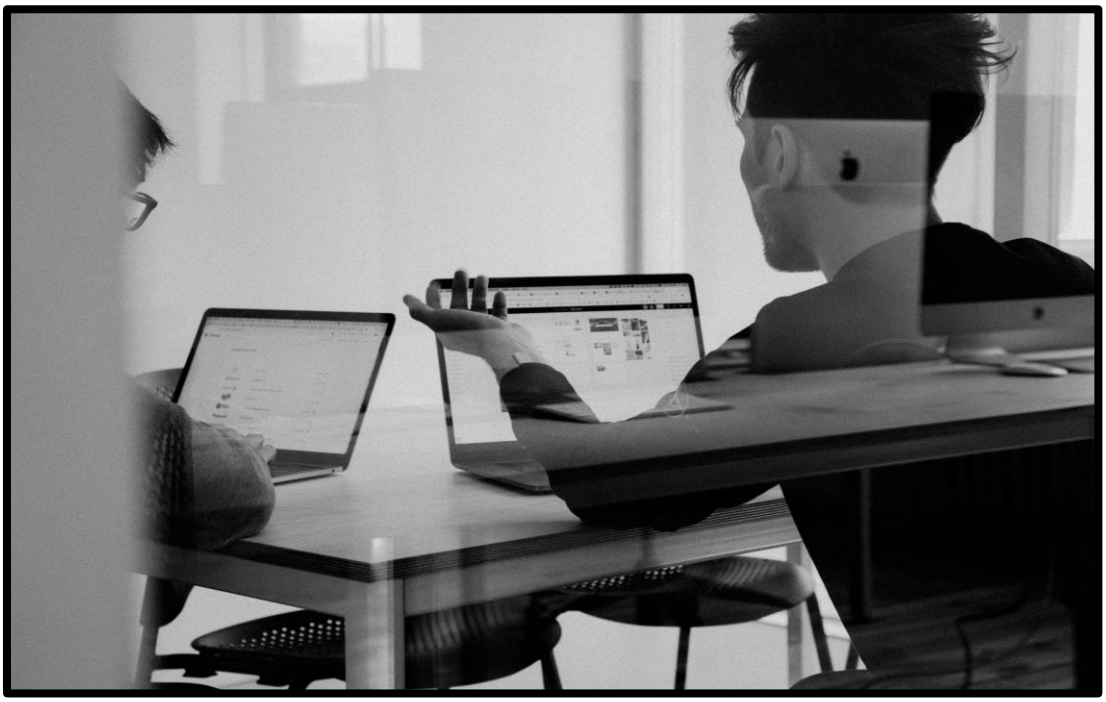
Image of a Spider in Web Used to Represent the Concept of Power Culture



Most groups recognised the non-metaphorical images in the first task as ones that contained no ‘clues’ as to what the concept meant; for example, a participant in Group 4-3C explained how the image used to correspond with *creativity* (see Figure 41) contained nothing that implied new products or new ideas, what he considered to be the outputs of creativity. The problematic penguin image (Figure 21) discussed under Theme 1 was identified as a difficult image to interpret by Group 4- 3A; for them, the dominant feature of the image was the sad loneliness of the single penguin walking away and did not imply anything relating to culture.

Figure 41

Non-Metaphorical Image Used to Represent Creativity



One participant (Q10) explained how some images might be too complicated, using an interesting example:

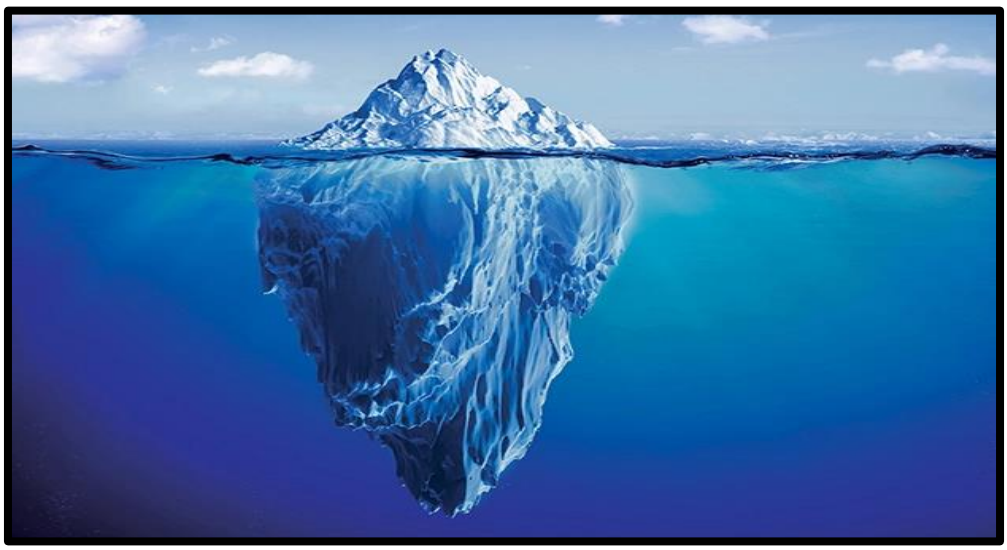
> Too many elements in the image. For example, you want to use a picture to explain what a cloud is, so please highlight it, do not choose a picture that contains an aeroplane, the sun, a balloon, or a bird in the sky.

This explanation is supported by the *coherence effect* argument described by Mayer and Moreno (2003). According to the coherence effect, unnecessary details should be removed from lecture slides and teachers should not be tempted to include *seductive detail* (Harp & Mayer, 1997). The image used as the source domain should include only relevant details.

The iceberg image (see Figure 42) was used twice across the teaching materials: to represent *hidden culture* and show the predominantly hidden nature of the *psychological contract* (Combe, 2014). The image was unanimously identified as a strong and clear visual metaphor in the Cycle 3 process interviews. Comments were so positive that it was replaced by an alternative image to evaluate in Cycle 4. This positivity may have been because the image was used twice, making it familiar through repeated exposure, but it may also be because it is striking. The image had been used in a metaphor extension exercise in which participants were asked, 'How does this picture represent the concept of organisational culture?'. The dominant feature of the examples provided was related to the iceberg representing how most of the culture is hidden. Phrases such as "hard to discover", "hard to change", "cannot be understood from the outside", "underlying culture", "mostly invisible", and "mainly hidden" are examples of perceptive responses provided by Groups S-1- 4 and S-3- 4. An iceberg as a metaphor has been employed in instructional design by other educators, such as Mandulak (Stachowiak, 2023) who uses the image to frame complex concepts that are part of her linguistics course (see section 2.13.2).

Figure 42

Image of an Iceberg Used to Represent the Concepts of Hidden Culture and the Psychological Contract



Through metaphor elicitation in Cycle 3, an image of an orchestra conductor was independently selected by two participants to represent the concept of *leadership*. In Cycle 4, I replaced the image of the duck and duckling (Figure 6) in a metaphor extension exercise with a conductor (Figure 43) to see if there was any difference in the quality of contributions.

Examples of six statements made by participants, one from Cycle 3 and one from Cycle 4, are shown in Table 4. The groups have been selected as they produced the most sophisticated interpretations of the images, using metaphor extension.

Figure 43

Image of an Orchestra Conductor Used to Represent the Concept of Leadership



Although a subjective conclusion, comparing the two columns would indicate that the image used for Cycle 3 provided relatively simplistic material relative to the one used in Cycle 4. The image of the ducks was interpreted using the word *lead*, supplied in the exercise prompt, or the word *follower*. Only the final statement ("Guide and nourish") provided a deeper interpretation/extension. The image of the orchestra conductor generated far more variety, including perceptive and subtle features such as "adjustment error" and "inspiring potential". Although powerful and clearly effective at communicating the concept of leadership, the image of the ducks did not seem to provide the potential for metaphor extension that the conductor image did. In this case, the latter image was familiar *enough* and, with the presence of other musicians in the picture, seemed to contain sufficient content to trigger deeper and more sophisticated thought.

Table 4

Examples of Metaphor Extension Statements from a Cycle 3 and a Cycle 4 Seminar Group

Cycle 3 (duck and ducklings	Cycle 4 (orchestra conductor)
Group S-A-3	Group S-1-4
"Comes with followers"	"Giving instructions"
"Followers trust the leader"	"Making harmony between departments"
"Take the lead"	"Controlling the situation"
"Leader provides the direction"	"Adjustment error"
"Teach to inexperienced followers"	"Transmitting information"
"Guide and nourish"	"Inspiring potential"

The image of the chameleon (see Figure 44) used in the matching task was also chosen as a strong visual metaphor by many groups, the image being used to represent the concept of *adaptability*. As well as the attractiveness and beauty of the image, something many participants commented on, this animal has the added advantage of being called Biànsèlóng (变色龙) in Mandarin, which translates as *change colour dragon* - a form of compound adjective (Shrives, 2011). This image was also highly regarded by attendees at the ARNA 2022 workshop; 86% regarded it as a strong visual metaphor, while the remaining 14% regarded it as neutral. Attendees also commented on how striking the image was. The somewhat nebulous concept of *aesthetics* is important, although challenging to analyse. However, research has suggested that when an individual perceives an image as aesthetically pleasing, the reward centres in their brain are activated (Reimann et al., 2010).

Figure 44

Image of a Chameleon Used to Represent the Concept of Adaptability



Image size differences were identified as another reason why an image was helpful in creating meaning. The most commonly discussed example of this was the image of the duck and ducklings (Figure 6). When I pushed participants to explain why this image had a particular impact in terms of helping them to understand the concept of leadership, several mentioned the size difference between the duck and her ducklings as a way of emphasising that the image contained a clear leader and clear followers. This size difference made the concept's core feature easily discernible.

A very articulate and thoughtful participant in Group 4-1A explained a subtle issue. He argued that visual metaphors are better for helping to explain nouns than verbs. For example, *limited resources* would be easier to communicate the meaning of than *controlling the workforce*. The participant also suggested that when action was involved, the best way to convey meaning would be to use a video; in this way, the movement that the verb suggests could be displayed. Using video was beyond the scope of my research, but it is something that I would like to explore in the future (see section 7.4).

In the 12 Cycle 4 process interviews, the participants were asked to consider four versions of lecture slides that included the familiar and popular image of the duck and ducklings (Figure 6). In each interview, there was a discussion about which of the slides was considered to be most effective. Eight groups chose Slide B (Figure 45) as the most effective, the slide labelled only with the word *leadership.* A participant in Group 4-1C argued that the smaller the number of words the better, and that, as long as the image was understood, text naming the image itself, its contents, or components were unnecessary. They even added that using a simple word next to an image helped deepen learning and made the concept more memorable. This may reflect the *signalling effect* from dual-channel theory, according to which learners should be explicitly directed towards the most important piece of information in learning materials (Mautone & Mayer, 2001) and, also from dual-channel theory, the *coherence effect* which suggests that any unnecessary information is a distraction and is better not included (Mayer & Moreno, 2003). Students need to know the word *leadership* but do not need to know the words *duck* or *ducklings*. This may be an

example of the *reverse redundancy effect* (Toh et al., 2010) and is not entirely contradictory to the instructional design advice of Clarke and Sweller (2016), who suggest that when text is included, it is short, concise and minimal. Toh et al. (2010) propose that concise on-screen text in English might be an effective way to gain the *attention* of learners. However, their research findings indicate that this technique is only effective when the delivery of the material (image, spoken word and text) is synchronised and delivered in small chunks. Treating a single word as a *one-word pitch* is, arguably, an effective and impactful way to communicate an idea (Pink, 2013). As Sword (2012) asserts, “The most effective illustrations, by and large, are those that complement rather than duplicate the text” (p. 108). There may also be an element of anticipation when an image is displayed first without text; such anticipation is a way to gain or maintain student attention and enjoyment of a lecture (Clark, 2008) and helps to begin the process of learning (Weinstein et al., 2018).

Figure 45

Most Popular Lecture Slide Format



Implied dynamism in an image, for example showing movement by blurring the picture, may contribute towards some images having more impact than others (Cian et al., 2015). The image of the two antelope fighting (Figure 46), used to represent the concept of *competition,* was chosen by many groups as a useful visual metaphor; this image includes implied dynamism in a way that the image used in Phase 1 (Figure 9) did not.

The usefulness of animal images cut through several themes. Some comments from participants related to the attractiveness of animal-based images. This implies a value in such images as being familiar, relatable and powerful as source domains and as a means of gaining learners' attention. As participant M3 stated, “using animal images (especially cute animals) will help a lot for student… more easier to keep pace with the class when they're still in process to get familiar with a new language”.

Figure 46

Image of Two Antelope Fighting Used to Represent the Concept of Competition



Theme 4: Contextual Transfer

A nuanced issue discussed in four interviews was how the image could be used to contextualise the concept in a business or management context. The circumstances and context in which we have perceived an image affect how we react to it (Maren et al., 2013); context matters, but contextual transfer is also needed. For some participants, if an image was being used to explain a concept in a business context, but the concept could be more appropriately contextualised in other ways, then the image might be problematic for use as a visual metaphor. As participant M8 clearly stated, “visual metaphors that link the source image to the target domain are useful when the information conveyed can be transferred to the context of the subject of study”.

The most problematic contextual transfer concerned the image of the runners crossing the finishing line (Figure 47), used to represent the concept of *commercial success*. Most participants who expressed an opinion thought the image was confusing because of its suggested association with word *commercial*. This was because the image itself had no commercial connections. Narrowing down the precision of the target domain to being commercial weakened the power of the visual metaphor. If the target had been simply *success* the image would not have been problematic for most participants, but it would not have been a metaphor. This is a subtle but important issue, as the reason for using the visual metaphor is to provide meaning by using an accessible context to apply to another (Cameron, 2003). Of this image, a participant in group 4-1C commented that sports are generally thought to be conducted in a “fair” way, but commercial activity and the actions of businesses are not fair; the image, therefore, seemed inappropriate to contextualise in this situation.

A potential problem with learning through assimilation[24] is that students may find it challenging to apply their learning to a different context from where it took place; for example, a location or subject (Illeris, 2007). It is important to ensure that what is being

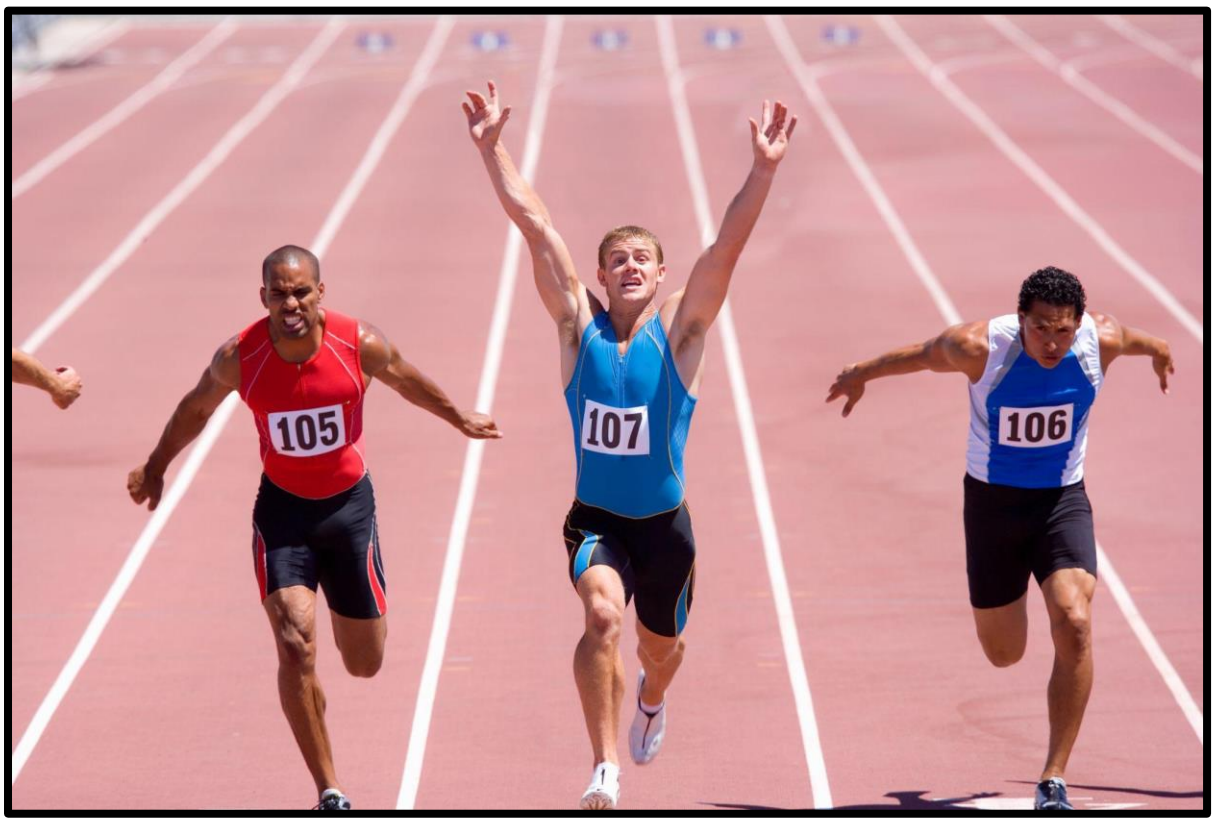
[24] Learning through assimilation is a process that is assumed to involve integrating new material with existing knowledge to construct new knowledge (Fry et al., 2008).

communicated resonates in the academic context in which the subject is being taught (for example, the world of business) for the learner to find meaning (Means et al., 1997).

All participants in my research were management students, and most had an academic background in business, management or economics. This foundational background inevitably meant that some concepts were more accessible than others. An image might help unlock meaning, but the understanding may already exist in another language. Thus, academic and linguistic background adds another dimension to contextualisation and contextual transfer. A participant in Group 3-1A explained this issue as follows: “Because I am studying management now, so that’s why I can understand it very easily, no doubt. But if I am not familiar with what is management, maybe I would not understand”.

Figure 47

Image of Athletes Used to Represent the Concept of Commercial Success



In Group 4- 2A, there was a discussion about how important it is for the source image to be easily contextualised in a business situation. This group also discussed how, if the source image itself becomes too abstract, the potential power of the visual metaphor is diminished. Returning to the key reason for using visual metaphors - to help make unlocking meaning easier - this reaffirms the importance of ensuring that images have clear meaning and are not themselves abstract but also that the metaphorical communication can be pushed into an appropriate context.

Theme 5: Cultural Contributions

Given that most of the students who take my course are from China, and therefore most participants in this research were Chinese, the issue of culture was inevitably an important factor. To be suitable as visual metaphors, images needed to be *culturally accessible* and *appropriate*. Being culturally accessible means they could be interpreted and used as visual metaphors by students from the dominant culture of the cohorts - China. Many images are culturally specific or situated (McFee & Degge, 1978; Roth & Diamantopoulos, 2009), so it is no surprise that images selected through metaphor elicitation were also reflective of or drawn from the participants' culture. As participant Q7 stated, "some metaphors of objects only exist in certain cultures and situations". Being appropriate means that the images did not have the potential to cause offence or discomfort, for example, by representing cultural appropriation (Han, 2019) or by depicting something that might be unacceptable in certain cultures.

Chinese and English use metaphors in slightly different ways, but this tends to be related to use in traditional, metonymical (non-literal or figurative) expressions (Goatly, 2007). Using metaphorical images should be less problematic, particularly as I attempted to ensure that images were *not* chosen based on what would be culturally appropriate for an exclusively western audience. Carefully chosen images should be accessible to Chinese students and arguably accessible to students wherever they are from and their cultural backgrounds. However, using images associated with a specific culture when a cohort is composed predominantly of students from that culture

might have value as a way of helping to unlock meaning. Aligning imagery with culture in this way might strengthen the familiarity and relatability discussed in Theme 1.

The concepts themselves had particular cultural resonance in some cases. The image of the lighthouse (see Figure 48) remaining steady in the face of stormy weather, and used to represent the concept of *resilience*, was an example of a situation where a better example based on Chinese culture could be used. Group 3-1A explained how the image of the lighthouse was unfamiliar to them. A participant in Group 3-1B explained how because of their Chinese background, the word resilience has particular cultural significance and is often explained using the metaphor of bamboo. The participant explained how bamboo may bend in strong wind or when laden with snow but will recover its posture. The metaphor is part of Chinese culture and is used in poetry that would be very familiar to students who have attended school in China (China Daily, 2011). Chinese poetry often contains rich layers of meaning and is economically expressed (Blakemore & Frith, 2005), with metaphors contributing to the perceived beauty of the language (Chen & Chung, 1994). In their comparative analysis of text production by Chinese and UK students, Xin et al. (2008) found that Chinese students were far more likely to use metaphorical language than UK writers. I asked other groups about the use of bamboo as a metaphor, and all were familiar with it; all were also confident that it would be helpful, and not inappropriate, for me to use an image of bamboo to help explain the concept of resilience. A participant in Group 4-2C explained how Chinese people have a "shared, common understanding" of meaning. She added that she believed that Chinese people "think the same way", so metaphor interpretations would be viewed through a particular cultural lens.

The metaphor elicitation tasks provided a valuable window into the participants' culture, as there were many examples of image choices that were strongly connected to Chinese culture. I brought examples of these into the process interviews to stimulate discussion and inquiry into the reasons for making particular choices and whether (or how) these images could be used in a more generalisable way in teaching materials. Three participants had independently brought in the image of Pu Yi (an example of one of these images is shown in Figure 49), the last Emperor of China, to illustrate the

concept of a *figurehead*, one of Mintzberg's principles of management (Boddy, 2016). When asked about this choice in the interviews, participants explained that an image of Pu Yi would be easily recognised by Chinese students (according to all the participants I asked directly, the image and his story should be very familiar to them). Justifying the choice, the participants who had chosen this image explained that it was suitable because he was a child when he became Emperor of China, so it was a good example of a figurehead in the way it had been explained in the lecture: the 'face' and ostensibly the leader of an organisation (here country) but not necessarily holding any real power or interest in management.

Figure 48

Image of a Lighthouse Used to Represent the Concept of Resilience



Figure 49

Image of the Emperor Pu Yi as a Child Used to Represent the Concept of Figurehead



Note. From *Pu Yi* [Photograph], 1914, Wikimedia Commons. https://commons.wikimedia.org/wiki/File:China_Under_Empress_Dowager

Participants described how, when asked to find an image to represent the word *sacrifice,* they immediately thought of stories they had been taught about sacrifice; they explained how such stories were integral to Chinese culture and education and, as such, were very familiar to them and their Chinese classmates. Several participants had found images of Chinese 'heroes' related to historical events such as war. These images seemed to resonate powerfully with participants when discussed. I had little familiarity with most of them or their stories, the exception being Lei Feng, who, it is claimed, was a soldier in the People's Liberation Army and whose image is still used in propaganda to support selfless obedience to the country (Osnos, 2013) making an image of him a good example to represent *loyalty*. Four participants independently used images of Feng to represent the concept of *sacrifice*. An example image is shown in Figure 50.

Drawing on the strong cultural traditions of China, many of which are embedded in Chinese history and reinforced through literature and education (Roth & Diamantopoulos, 2009; Blakemore & Frith, 2005), could provide material for strong visual metaphors. Such images were familiar and had well-established target domains, meaning the connections between source and target were already established. However, I was unsure how appropriate it would be for me, as a western educator, to use images not taken from my own western culture. This could be regarded as a moral dilemma; I have immense freedom when designing my instructional materials and what to include (e.g. a particular image) and whether it is appropriate is an example of the moral agency I am afforded (Molla & Nolan, 2020).

Figure 50

Image of Lei Feng Used to Represent the Concept of Sacrifice



Note. From *Lei Feng* [Photograph], before 1962, Wikimedia Commons. https://commons.wikimedia.org/wiki/File:Lei_Feng.jpg

The issue of images being appropriate for use in instructional design by a western educator was discussed at length in two interviews. While participants welcomed images drawn from their own culture and generally felt that it was acceptable for a western teacher to present them, there were some reservations. For example, a participant in Group 3-1B commented on an image of Chinese military marching in formation (a similar image is shown in Figure 51). A student had brought in this image to help explain the concept of *loyalty*. They used it to provide a highly effective explanation of the characteristics of the concept (for example, following orders, complying with rules, and not questioning authority). However, the participant in Group 3-1B contended that the image could be perceived as "aggressive" to non-Chinese students, especially those from countries with which China has a history of conflict or diplomatic sensitivities. The same participant explained that students from Japan or Korea, for example, might consider such an image being used in an academic situation as highly inappropriate and even in bad taste. This view is based on political sensitivities between China and other nations connected to historical and ongoing conflicts and disputes (Burcu, 2022). As the participant in Group 3-1B articulated:

> For Chinese people, the soldiers are loyal to the Chinese government and Chinese people, residents, and for England the UK military are loyal to their residents and people, so it would be strange if you… If anyone other foreigners put a military image of other country to show loyalty. It would be… I would say it's not that appropriate.

Figure 51

Image of Chinese Military Used to Represent the Concept of Loyalty



There were some discussions about how effective or suitable some images might be if *not* used in a context where students were almost all from China. Participants in Group 4-2A expressed concerns about how non-Chinese students might find it challenging to interpret culturally specific image choices. They believed that too many difficult questions about who a person in an image was could make some choices unsuitable. They showed a high level of awareness and sensitivity that Chinese students were the dominant group but were clear that images should not be used that would be problematic for non-Chinese students, even if there were few.

The image of the penguins (Figure 21) that had been used to represent *subculture* had caused confusion. The concept of subculture itself was problematic as a particularly challenging abstract concept. Through the phased narrowing exercise, an image of a *punk* (Figure 52) was selected as a more suitable image to represent

subculture. Interestingly, many of the images found by participants depicted Chinese punks. I discussed this with several participants, who explained that this is a strong example of a cultural subgroup in modern China and would be widely understood as such, particularly by younger people. As participant PN8 explained, “Her strange outfits and hairstyles are entirely different from the mainstream image, which is a popular culture among minority groups”, while for PN2, the way someone dresses *is* the primary representation of their subculture. I would assert that this example may now seem somewhat dated for a UK audience. However, many would no doubt understand punk culture as anti-establishment (Glass, 2012), not mainstream, and in that sense, a subculture.

Figure 52

Image of a Punk Selected to Represent the Concept of Subculture



Metaphor themes are often created or reinforced by cultural experiences (Goatly, 2007). Sensitivity and awareness of these themes will be advantageous to anyone attempting to build visual metaphors into instructional design. However, it was apparent that most of the visual metaphors used in the lectures, and most of those used by participants as part of the metaphor elicitation exercises, were not culturally specific and could provide meaning across cultures. One dissenting voice on this issue was participant M8, one of only two Korean students in the Phase 2 cohorts, who had observed differences in culture and had some concerns about the use of visual metaphors. Her cultural detachment gave her a different perspective on culture. As she explained:

> Meeting people from different backgrounds, I was surprised how different the learning level (or the way they comprehend the metaphoric messages) could be according to cultural background even though students have the same degree. Which means, it could be hard to deliver the messages you intended to all students at once.

Using images drawn from a particular culture in instructional design must be a judgement based on the cultural mix of a cohort and its dynamics. Culture and cultural differences are inherently interesting. As Leask (2005) explains when providing advice on how to improve the quality of teaching delivered to international students, “Cultural diversity in the classroom can be one of your greatest resources for developing your own as well as your students’ international/intercultural perspectives” (p. 122). As explained in section 2.5, images may also be used as external cues to activate related cultural constructs; it is possible that cues that are culturally familiar may allow students to use a cultural lens that they have been supressing which might help to enhance their learning experience.

Theme 6: Metaphor Elicitation

Simplified metaphor elicitation tasks were used to help gain insight into the types of images that students consider to be most helpful as visual metaphors (Coulter & Zaltman, 1994). However, it was apparent that what I had anticipated would be a simple and unobtrusive way to collect supplementary data (Spencer Clark et al., 2020) was also useful as an instructional technique. Metaphor elicitation provides insights for research purposes (Christensen & Olson, 2002) and conceptual insights for learners. Furthermore, beyond simply providing an insight into the types of images that participants regarded as helpful, the process also provided an insight into culture; this was because some example images were drawn from or representative of Chinese culture. Some of these image choices have been discussed under Theme 5.

In all the interviews, participants were clear that being asked to find images was easy to do, enjoyable, and not time-consuming. More importantly, most groups explained that they had undertaken the tasks thoughtfully, not simply selecting images based on a quick 'image search' using a search engine. A participant in Group 3-4A described how the images encouraged greater independence and depth of thought because, when looking for a suitable image, the task required them to think about what would effectively communicate meaning to their peers rather than that decision being made by me, the teacher. A participant in Group 4-1B explained how the selection process itself contributed to learning: "Even when we are trying to find the pictures, we were keep thinking of the meaning of the word, and the best match pictures of it, so it really helps I think". The way in which *thinking* was regarded as a necessary part of the selection process indicates that participants were generally attempting to make sense of the concept and how it would connect with a particular image; they were seeking meaning and learning. Of almost 150 images found by participants in Phase 2, approximately 60% could be regarded as visual metaphors.

In terms of cultural insights, it was apparent that there were three possible reasons why participants were choosing culturally specific images: because such images were familiar and relatable to them, because they knew that they would be familiar or

relatable to other students, or because they wanted to expose me to an aspect of their culture that they thought that I would be interested in, or unfamiliar with. Each of these reasons has value, the first two as they help to make images appropriate for the target audience, and the latter as it provides satisfaction and pride. All acted as powerful extrinsic motivators to complete the exercises to a high standard (Ryan & Deci, 2000). A participant in Group 4-3A described how he was intrigued by the idea of showing *me* images that were culturally specific to China: “I don’t know if you like some pictures about Chinese culture or history, but I think this is a good opportunity to introduce to you some of our country’s culture and history”. This enthusiasm helped to provide a stimulus to complete the exercises to a high standard and strengthened the relationship between us.

The ability of a visual metaphor to help anchor a concept in memory (Reyna, 2018) was also noted by several participants, or as a participant in Group 4-1D described it, the “idea is formed”. When pushed to elaborate on how helpful the metaphor elicitation tasks were in terms of supporting learning, a participant in Group 4-1B responded that, “Yeah, actually it’s really helpful to remember, and because we need to explain to you after that, so I think it was really helpful to me personally”. Again, the motivating effect of having feedback on their image choices and explanations from me in front of their peers seemed significant.

Therefore, the expectation that I would ask them to explain their allocated concepts using their chosen image created added useful pressure. In each of the two cycles in which metaphor elicitation was used, a pattern emerged whereby when the exercise was first used with a seminar group, some efforts were disappointing and needed more thought. A valuable competitive dynamic emerged after this, in which participants did not want to disappoint me or be embarrassed in front of the class. This may have been a cultural issue related to Chinese students placing great importance on saving face (Li, 2020). Consequently, the quality of image choices improved over the weeks, reflecting greater thought about how the source image connected with the target concept to create a more powerful visual metaphor. This *competitive* element

undoubtedly increased the quality of choices as students I often struggled to gain written homework from participated enthusiastically.

A participant in Group 4-2B explained that finding an image that was culturally connected to China added an extra impetus to the level of thinking that they would need to devote to the task as it would involve not only *explaining* the (target) concept but explaining the *relevance* or *context* of the image. They argued that this extra layer of explanation was helpful in that it pushed them to gain a deeper and more meaningful understanding of the concept. This is an example of learning due to being asked to explain to others (Duran, 2017).

Half the groups expressed concerns that they had found some, though not all, of the images chosen by other students as confusing or unhelpful. Some participants argued that although they had devoted time and energy to finding their own images, they felt that not all students had chosen carefully or meaningfully. A participant in Group 4-1A stated that a potential problem with using a particular visual metaphor is that “not all people think in this way”. Even when a group is composed entirely of Chinese students, this is not a group with a homogenous outlook; as a participant in Group 4-1D explained, “even if we are all Chinese… everybody’s idea is different”, reflecting the conclusion made by Heng (2019), that Chinese learners should not be regarded as a purely homogeneous group.

Some image choices were problematic because of their specificity. Examples of specificity included images from television programmes and films, the choice of which was not familiar to a large number of participants. A small number of participants remained oblivious to how such choices meant that their explanations were supported by images inaccessible to a large proportion of the group. The important features of familiarity and relatability (Theme 1) were largely lost.

There were surprisingly few instances of humour being used. Some participants chose cartoons, but these were often designed to make a point rather than to be amusing. The very small number of non-Chinese students were the ones most likely to seek

humour in their chosen images; this implied that Chinese students felt that a teaching and learning task was not an opportunity to introduce humour. This reflects the conclusion that Zhou and Li (2015) make that Chinese educators rarely employ humour in their teaching, regarding it as a waste of valuable instructional time.

5.4 General Analysis of the use of Visual Metaphors

Across all data collection forms in Phase 2, no participants argued that using visual metaphors was ineffective. Although my positionality (see section 3.6.5) could have contributed to an excessively enthusiastic interpretation, the depth of questioning in the interviews and the variety of data sources provided many opportunities to express an unfavourable view.

Although Phase 1 confirmed the difficulties that participants encountered when attempting to understand abstract concepts, Phase 2 also included some discussion of the issue. For example, participants in interview Groups 3-1B and 3-2B identified the concept of *creativity* as abstract and particularly difficult to explain. This is because, they argued, creativity can mean many different things. The concept itself is not only difficult to define but also open to various interpretations or calibrations. A participant in Group 4-1B explained another reason abstract concepts might be difficult to explain; they argued that there is often uncertainty about how the concept is used. Even when words are found to describe or explain an abstract concept, there is unlikely to be agreement on this choice of words.

Many general comments on the use of visual metaphors were related to the use of them in instructional design for international students. As a participant in Group 3-3A explained:

> I think it's a good way to teach and to learn because it can, especially where it's like international students, not know English that much, it's really good to connect to the words with a kind of image. It's really good to remember the words and to use it in daily life, and also the class.

The participant then explained how using an image when a concept is being explained to them can help with understanding the concept because of the connection that can be made. They described the link between source and target domains without using the terminology.

The power of visual metaphors to create an accessible point of entry to understanding a concept was also emphasised. A participant in Group 3-4A explained, albeit in a clumsy way, the benefits of visual metaphors for students new to the subject matter. They described how the images have real value and encourage them to engage with the learning process:

> I think most of the time it's very useful and, you know, for me I didn't study… management before. If you just put… give me a, like, charts and like write all the meanings of the words, maybe I don't have any like patience or within one look I just said it's very complex for me to understand, but if you send me with some picture, it's really helpful for me to be honest.

This argument was repeated by a participant in Group 3-5A who described how visual metaphors "Help me more understand a word… because some words is very strange for me. If I can look at this picture, I can know this picture taught me".

Images have an attractive directness and visual metaphors seem able to add meaning to this directness. However, participant Q1 explained, "The thing about visual metaphors I think is that they tell you what it means by way of suggestion rather than directly". The understanding is drawn from comparing the concept's name with the picture. A participant in Group 3-6A expressed this even more dramatically (and metaphorically):

> I think using pictures to let others know the meaning of the word is useful because it is like that the image is burning in my brain, so everytime I see these words I think about the image and then realise the image straightforward.

For a participant in Group 4-3E, visual metaphors are a valuable component of instructional design because communicating with students for whom English is not their first language is problematic and may be a slow process. They argued that understanding the meaning of abstract concepts is challenging, and visual metaphors can help make the concepts “easy to explain”. In this way, the use of visual metaphors may help to improve what cognitive scientists refer to as *cognitive fluency* (Pink, 2013), the speed and ease with which the human brain can make sense of stimuli.

It should also be acknowledged that too many images could be used in instructional design. If too much cognitive capacity is dedicated to interpreting image after image, that might actually impede learning. This potential problem was alluded to by a delegate who watched my presentation at an Oxford Brookes colloquium (see Appendix 3). While generally positive, they contested:

> Fascinating stuff, thank you. I will just say that the imagery is both captivating and distracting. One can be interpreting it oneself rather than agreeing with the presenter’s perceived reason for choosing it. On your slides with ideas/theorists I was also feeling the loss of a pictorial element, which shows that in using pictures you may be the victim of your own success?

We then had an online discussion about the issue of not overusing visual metaphors. Less may be more.

Participant M5 warned of the way in which visual metaphors may be useful, but may also be restrictive:

> I think visual metaphors are common in our daily lives and can deepen our understanding and empathy for things. What I mean by this is that it can visualise concepts in our minds, but at the same time, it can also limit our imagination of the pictorial sense of the target domain.

As a final general point, when I asked the groups I interviewed if they had any experiences of talking about their learning with teachers, researchers or anyone else, none of the Chinese participants had any experience of being asked to be metacognitive. Participants explained that many undergraduate courses in China are delivered predominantly through lectures (especially true of business and accounting courses). Participants also explained that very few *opportunities* to discuss learning with teachers were available. Students were primarily expected to follow instructions and to tackle any difficulties themselves, with teachers making all decisions about instructional design and its execution.

5.5 Conclusion

Phase 2 was more successful than Phase 1 in terms of the quantity and, more importantly, quality of data collected. Far greater specificity of what types of images were suitable or unsuitable, helpful or unhelpful, and why was expressed by participants. The process interviews were fundamental to this success. The tasks helped to overcome, although did not eradicate, the problem of metacognition, and the use of metaphor extension exercises and especially metaphor elicitation tasks generated artefacts that could be used as relevant stimulus material in the interviews. An unexpected outcome was how metaphor elicitation seemed to positively impact the learning experience and provided some fascinating insights into the participants' culture. By the end of Phase 2, I was confident that data saturation had been achieved and that no further formal cycles were needed (Saunders et al., 2018).

Chapter 6: Findings, Claims, Recommendations and Contributions to Knowledge

6.1 Introduction

The primary purpose of the research was to explore the use of visual metaphors to communicate the meaning of abstract concepts in lectures delivered to international postgraduate students. Gaining a sufficient understanding of what types of images were most effective and why to construct a model of strong visual metaphors has been achieved and is explained below. However, finding ways to gain the necessary insights also led me to develop process interviews and use simple metaphor elicitation. This chapter discusses my research findings and claims and contributions to new knowledge, as well as suggesting a model of the facets of strong visual metaphor. The chapter also includes some recommendations for how practitioners might use the model and how researchers might use process interviews.

6.2 Research Findings and Claims

6.2.1 Visual Metaphors to Unlock Meaning

Metaphor use has been shown to be a powerful way to communicate the meaning of complex or abstract concepts. As Deutscher (2005) explains:

> Metaphor is an essential tool of thought, an indispensable conceptual mechanism which allows us to think of abstract notions in terms of simpler concrete things. In fact, it is the only way we have of dealing with abstraction. The desire to communicate abstract concepts is thus behind a relentless surge from the concrete to the abstract. (p. 142)

My research has considered how the strength of metaphorical communication can be further enhanced using visual metaphors rather than those used in discourse. Visual

metaphors can be used to help unlock meaning when used in the context of lectures, contributing to a better learning experience. This unlocking process has particular merit when learners are encountering abstract concepts, which are more challenging to understand. Phase 1 of the research provided evidence that participants found the use of visual metaphors as a teaching technique enjoyable and, more importantly, impactful on their learning. When used in a thoughtful and informed way as part of instructional design, the powerful and effective communication possible using visual metaphors is compressed, engaging and, importantly for international students, can minimise the need for written or spoken words. The attention that images are able to gain is also valuable; according to du Sautoy (2021) tweets that contain an image are three times more likely to be engaged with than those that contain text only. Visual metaphors are also useful for helping students to see the bigger picture and to contextualise concepts. However, not all visual metaphors have equal strength and impact.

This study suggests there are seven principles regarding the use of visual metaphors in lectures. These are explained below, in order of importance:

1. The image used as the source domain should be familiar to the target audience, and they should be able to relate to it. Garner (2005) emphasises the importance of the source domain being recognisable when constructing metaphors, and the same is true for visual metaphors. Familiarity and relatability will ensure that learners can use the image to begin the process of unlocking meaning. An image must be familiar and relatable to succeed in its intended purpose.

2. A strong and unambiguous comparison between the source domain image and the intended target concept should be strived for. This bridge or link that maps between the source and target *makes* the image a visual metaphor, not simply a picture of a situation or object. Images have the most impact when the connection is clear, requires little or no explanation, and there are no multiple possible target concepts (Memon, 2021). Novice learners appear to prefer

simplicity and easily understood metaphors, though teachers, academics, and more experienced learners may enjoy the complexity and the challenge of interpretation.

3. The chosen image should be composed of features that strengthen the visual metaphor. The elements of the image should reflect the intended message; missing elements may be a source of confusion. To gain and maintain attention, it is also important that the chosen image is not too complex (Kang & Kim, 2019) and that the implied metaphor is itself not abstract (Griffey et al., 1986). Unnecessary extra content should be removed from learning materials and obstacles to learning minimised (Mayer & Moreno, 2003). However, different content elements may result in different levels of sophistication in terms of interpretation; as explained in the previous point, the audience to which the visual metaphor is presented may determine how complex the image choice should be. However, the research into image complexity and interest is inconclusive. Ultimately, the content of the image is important and can be supportive or distracting and confusing. As neuroscientist Willingham (2023) stresses, when someone gives attention to an example of metaphorical reasoning there are “features that matter and features that don’t” (p. 57).

4. Images of animals can be a powerful way to communicate concepts related to human features. Through anthropomorphism, animals may represent simplified, and therefore more easily understood, versions of human characteristics and behaviours (Wang & Basso, 2019) including those that are highly abstract. Animal images may also interest the viewer and help gain their attention as a first step towards deep thinking (Blakemore & Frith, 2005). However, it is important to ensure that learners have familiarity with the features and characteristics of the chosen animal; there are cultural and geographical differences in terms of which animals are familiar and which are not.

5. Images should be used to generate visual metaphors suitable for transferring into the learner’s academic field context. If an image is being used to help

communicate the meaning of an abstract business concept, it is vital to ensure that the transfer to that context, and mapping to that domain, is possible. This is a subtle feature, as the source domain will inevitably be detached from the target; otherwise, it would not be a visual metaphor. Nevertheless, if the image pulls the focus of the learners' thoughts too far away from their academic field, the visual metaphor will be weak or ambiguous. It is important that the visual metaphor does not lead to confusion in relation to meaning (Carey, 2014).

6. When the image is presented, the written word for the concept being introduced should be included on the slide. This is a basic form of the signalling effect (Mautone & Mayer, 2001). Naming the image itself or its content should not be necessary; if the image is familiar and relatable, the student will know what it is. Presenting the name of the concept implies the *reverse redundancy effect* (Toh et al., 2010), in which the extra item of information is valued because learners may be unfamiliar with it. However, being able to name the image or its contents should not be necessary for the visual metaphor to be effective.

7. The cultural background of the target audience is relevant to the choice of image. Images may be unsuitable as visual metaphors simply because of a cultural lack of familiarity or because the implicit meaning connected to the image is likely to be interpreted differently by students from different cultures. If the teacher uses images from the students' cultural backgrounds, this needs to be executed with caution and sensitivity. Some images might bring particularly welcome and appreciated familiarity, but images that could cause potential offence should obviously be avoided.

6.2.2 Process Interviews - An Innovative Research Method

Process interviews were developed as a direct result of the difficulties I encountered with eliciting explanations from participants in the focus groups used in Phase 1. These difficulties were based on the challenges of metacognition (de Blume et al., 2017). Successes with the tentative incorporation of tasks within the Cycle 2 focus groups motivated me to use this approach more extensively and, ultimately, to more effectively answer research question RQ1.

Although the process interviews were specifically designed to gather data relevant to my research, other researchers might also find the approach useful. Feedback at conferences and symposia where I explained the technique (see section 3.5) supported this view. The difficulties I have encountered when talking to international students about how they learn have resonated with other researchers; most of these researchers were not working with international students but were seeking ways to elicit difficult to find insights into participant thinking.

In research situations where the challenge of metacognition is encountered, process interviews have the potential to help elevate an interview to a context where reflection is deeper and more meaningful. Participants can be questioned about an issue fresh from having undertaken a cognitive task in which *that issue* is the focus. Researchers may find process interviews particularly useful when striving to find insights into participants' deeper thoughts, especially those that they are likely to have difficulty articulating.

The data collected through focus groups in Phase 1 was probably affected by the discussions being almost entirely in English, making it difficult for some participants to contribute. Conducting interviews completely in English and insisting that all discussions between participants be in English, would doubtless have harmed my ability to collect meaningful data (Skyrme, 2007). I would have left my participants frustrated and at a disadvantage linguistically and expressively. Therefore, the Phase 2 approach of taking more technical and complex discussions into their mother tongue

(in the linguistic space or breakout room) and reporting back, complex or possibly contentious, conclusions in English may have provided a worthwhile, if not superior, blend (Cortazzi et al., 2011). Ultimately, I was able to allow participants to draw on their language strengths, using their first language as necessary to help generate high-quality contributions. This cross-linguistic approach can be practical and flexible (Cummins, 2021) and is not necessarily a compromise.

My eleven recommendations for conducting successful process interviews, based on my experiences in Phase 2 of the research, are as follows:

1. Prepare the materials carefully. This will probably be a time-consuming process, but creating high quality resources (e.g. laminated images) and labelling templates (e.g. a diamond nine) with the group code will help to make the entire process unfold smoothly. The researcher's priority needs to be on data collection, so other elements need to be prepared in advance. Recording and photographic equipment should also be ready at the start of the interview. Interviewing people speaking in their second language, using strong accents will be a challenge to transcribe, so using a high quality omnidirectional microphone would be advisable.

2. As participants complete a task, allow them to talk amongst themselves freely. Depending on the situation, this might mean placing them in a breakout room or the researcher temporarily leaving the room. If the composition of a group is appropriate, provide them with a *linguistic space* in which language ceases to be an obstacle to discussion.

3. Allow participants space and time to discuss their responses. The use of breakout rooms in this situation provides a distinct advantage as the researcher is not physically present, minimising the possibility of response bias (Burchett & Ben-Porath, 2019). When interviews are face-to-face the interviewer should remain largely disassociated from the discussion while the participants consider their responses.

4. Allow adequate time for feedback following the completion of tasks and be patient with clumsy expression. The final step of communicating group consensus probably needs to be made in the participants' second language (or the language of the researcher), and the quantity and quality of data generated will be better if sufficient time is allocated to this process. The researcher will inevitably need to seek clarification of participants' intended meaning with some feedback.

5. Do not expect all participants to speak an equal amount. If the quality of the group discussion is sufficient, one dominant participant will likely emerge as the spokesperson for the group and its views. This is not a lesson, so the critical factor is that the participants' voices are heard in some form, even if reported and represented by others.

6. Make the tasks *puzzles* where possible. The diamond nine task was especially useful for eliciting thoughts about priority, strengths, and weaknesses. Agreeing on a hierarchy of preferences helped generate purposeful discussion and directed argument. Forcing negative choices to be made, such as selecting the weakest example, pushes the discussion into the valuable, although potentially uncomfortable, area of talking about what is not effective and why (see point 11).

7. Take photographs of the completed tasks. These will be useful as data sources in themselves but will also be helpful to refer to when transcribing the interviews (to recall and contextualise what participants were discussing). Ensure that the materials are clearly labelled with the group code in order to ensure that they can be matched with the appropriate transcript. Some completed tasks, for example diamond nine tasks, may be a valuable way to gain an overview quantitatively by counting choices that participants made.

8. Use images as a stimulus. Participants do not view incorporating images into research (and teaching) materials as childish. Images are accessible and

encourage thought; visual metaphors encourage *deep* thinking and can unlock meaning. Images found by the participants (in my case, through metaphor elicitation) will be welcomed by them as discussion material. They may be surprised by how interested the researcher is in their choices.

9. In the spirit of semi-structured interviews, do not rigidly keep to the interview schedule. The tasks will expose issues that were not expected and will differ between groups. These issues, where relevant to the research, should be explored.

10. Expect the interview, and the resultant transcripts, to ebb and flow in terms of relevant material. There may be transcribed passages that have little apparent relevance. This is part of allowing participants to feel that this is a discussion, not a series of questions to answer. Moving away from the interview questions, being playful with language, and listening to opinions on irrelevant material may all add to the length of the interview but will enhance its quality and dynamics. If it is appropriate, reassure participants that entire transcripts will not be seen by third parties, only extracts from them; this may help to reduce the pressure or anxiety that some participants may feel about their words being reproduced and used in academic documents.

11. Ask probing questions about extremes. Focus on what was chosen first, last, or regarded as strongest or weakest. Participants are likely able to explain more about *why* they made these choices than choices placed in the middle, where there may be little (if any) strong feelings.

The final recommendation is important. Focusing on what is wrong or weak might reveal more than focusing on what is right or strong. Minson et al. (2012) have described such questions as “negative assumption questions” (p. 275). They argue that such questions, in which there is an implicit assumption that something is wrong or weak, encourage participants to be assertive in their reasoning and likely to regard

researchers as “more determined to gather accurate information than those who asked a General or Positive Assumption question” (p. 275). It seems that if a researcher wants to uncover the *true* feelings and thoughts of participants, the best questions to ask concern what problems there are with the situation (Heath & Heath, 2013). The diamond nine task has a negative assumption built into it as participants must choose the least useful image.

I wrote the paper about my use of process interviews (Cotterill, 2022b) so others might judge their value. Significantly, one of the peer reviewers of the article commented on how the method was “culturally sensitive”, reflecting the way in which it enabled participants who might struggle linguistically, or find being asked questions uncomfortable, an opportunity to articulate and express their thoughts.

6.2.3 Metaphor Elicitation

The creative aspect of metaphor elicitation (Coulter & Zaltman, 1994) was an important contribution to answering research question RQ1, and the data generated subsequently helped me to answer research questions RQ2 and RQ3. Hughes (2006) argues that allowing people to create metaphors is a very effective way for them to find meaning. Metaphor elicitation worked well for gaining further insights into the types of images that participants felt were most useful. Furthermore, the process of metaphor elicitation was enjoyed by all those who expressed a view, partly because, as a homework task, it was easy and quick to do, but also because, many explained, it made them think deeply about the concept they had been allocated and how they could find a suitable image. In short, this was a relatively painless and enjoyable way of learning the meaning of abstract concepts.

Metaphor elicitation enabled some fascinating insights into Chinese culture to be exposed and discussed in seminars; this was something that many students enjoyed, not least because they found it satisfying to teach *me* something new and were surprised by how interested I was in what they had to present and explain. The subtle

connection we made, and the positive impact it had on classroom dynamics, cannot be understated. The shared element of gaining an understanding that was part of the process of finding and explaining image choices was important. In their Advance HE resource pack, Lomer et al. (2021) suggest the value of providing a platform for students to share their views in order for them to be given meaning and value; metaphor elicitation is such a platform.

Metaphor elicitation is a valuable research tool and a window into culture, but it has potential as a teaching method that can make lessons more interesting and the content more accessible. This use of metaphor elicitation - as a feature of instructional design - is suggested tentatively as a third, as yet not fully explored, contribution to knowledge.

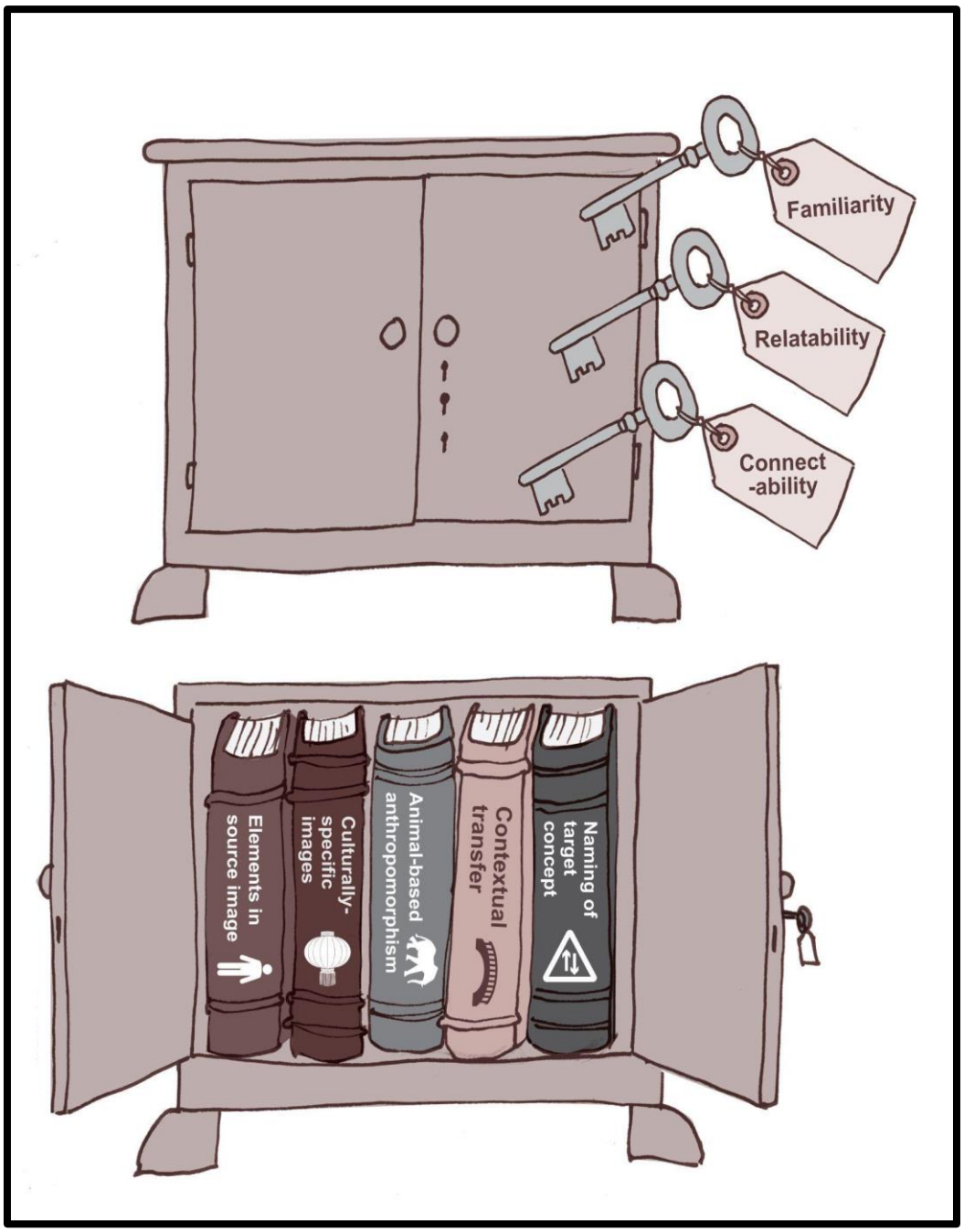
6.3 Eight Facets of Strong Visual Metaphors: A Model

Drawing on the research findings, I have constructed a simple model to summarise the important features of a strong visual metaphor. Creating a model has enabled me to engage in further, deeper analysis of the features, or facets, of a strong visual metaphor by considering the relative importance of, and relationships between, the features (Briggs, 2007). Depicting the facets as an image (see Figure 53) is not a gimmick but is a way of visualising the components of the model in a more meaningful way that is easier for the reader or viewer to interpret (Miles & Huberman, 1994). Briggs (2007) argues that “filtering the data through the model enables further understanding” (p. 591), implying that better insights are achieved through its construction. The hierarchical nature of the facets has been such an insight. Models can also be valuable for other practitioners to make practice-based decisions (David, 2001); I hope this model can do that, as one of my research questions (RQ3) was to find a way to allow my research findings to resonate with other practitioners. A model is a way to construct knowledge (Eriksson, 2003) but may also be a way to use it and operationalise visual metaphors in instructional design. I should acknowledge that my validation team was exceptionally helpful with critical input on how the model should

be presented, and what it should and should not include, in order to make it accessible and meaningful to readers of this thesis.

Figure 53

Depiction of the Model of Facets of Strong Visual Metaphors



There is no definitive way to construct a visual metaphor; this is not a science, and how different people interpret images means that this model will not necessarily ensure that a visual metaphor will always be effective for every situation. However, the research findings can be directly connected to facets of what will constitute a visual metaphor more likely to be successful at communicating meaning.

There are eight facets, the first three of which are essential for communicating and thus unlocking meaning: *familiarity, relatability* and *connectability*. In Figure 53, these are depicted as three keys that must all be used to unlock the cabinet. The remaining five facets are potential ways to improve the strength of a visual metaphor; these are not essential but can enhance a visual metaphor or the way it is used and therefore enhance the learning experience. The eight facets, expressed as recommendations, are described below:

1. The source image should be familiar to the learners. Practitioners should choose an image of an object, being or situation that learners are highly likely to have seen before. Unfamiliarity causes confusion.

2. The source image should be relatable to the learners' knowledge, life and experiences. If learners do not understand what is depicted in the image, it will make understanding a more abstract target domain difficult or impossible.

3. For novice learners, the connection and comparison between the source image and the target domain should be clear, simple, and unambiguous. While more experienced learners may enjoy contemplating the connection, for learners already experiencing a high level of challenge, this extra obstacle is unwanted and unhelpful.

4. The source image should contain sufficient elements to communicate meaning. If the target domain is based on interactions, for example, this needs to be clearly expressed in the image. Unnecessary elements may overwhelm and confuse.

5. Make use of culturally specific images, but with caution. Learners may enjoy discovering that their teacher is interested in their culture and may welcome the use of images drawn from it. However, culturally specific images have the potential to be confusing or even offensive to those from other cultures.

6. Consider using animal images as a source domain. The anthropomorphic features should be carefully considered; to be effective for building a useful visual metaphor, the animal (or animals) in the picture, and their characteristics and behaviours, should be familiar to and understood by the learners.

7. The visual metaphor will be most useful if the communicated message can be transferred to the context of the studied academic subject. A visual metaphor that explains a concept may lose effectiveness if the interpretation cannot be located within the subject matter context.

8. When presenting the visual metaphor, show the name of the target concept. There is no need to label or name the source image. If the image itself requires explanation, an alternative image that complies with the first three facets should be chosen.

6.4 Using the Model to Promote Learning

My research findings have found resonance with others who teach concept-heavy courses and those who teach international students learning in a second language (see section 3.5.2). The model described in 6.3 should enable practitioners to reflect on image choices and, based on my findings, identify images that will be most impactful. Depicting the model as an image has been used in the spirit of clarity and effectiveness of communication; as action researchers McNiff and Whitehead (2009) assert that “Medium and message are inseparable, and quality in one reflects quality in the other” (p. 3). The resonance that my findings seem to have with others is only possible if they are easily understood.

The research's original focus was on using visual metaphors in the context of lectures. However, the technique could, of course, be used in other instructional materials. Nevertheless, the most useful feature is the ability of a visual metaphor to provide a real-time understanding of a concept, making it particularly well-suited to exposition-based teaching situations.

When reflecting on Freire's teaching methodology, Bates (2019) - a highly experienced HE trainer - advises that teachers find original ways to represent problems. He suggests that such originality might be found through the use of metaphors. If metaphor is "not simply an ornamental aspect of language, but a fundamental scheme by which people conceptualize the world and their activities" (Gibbs Jr, 2008, p. 3), it has a role to play in effective teaching. Evidence suggests that lecturers in HE are often reluctant to move away from traditional pedagogical techniques (Henderson & Dancy, 2007), so creating an appealing way to present new pedagogical methods to such teachers is important. I believe the model is simple and accessible enough to be viewed as usable and useful by practitioners who might otherwise be resistant to new approaches.

Marton and Booth's (1998) view that learning is about perception, understanding and *finding meaning*, resonates with me. As a management teacher, I want my students to understand the language and mechanics of models and theories and be able to find ways to use these models and theories in the context of real business situations. To do the latter requires finding meaning, as, without this, models and theories remain abstract and unrelatable to the real world. More than simply remembering material is required. Meaning must be found in it, and effective teaching communicates that meaning. In situations where new, abstract, or complex material is being introduced, visual metaphors may be a powerful way to ease learners into finding meaning.

Illeris (2018) argues that learning in a formal educational context, such as a university lecture, requires two processes. The first is the interaction between the student and the external environment. For example, the exposure to an exposition made by the instructor. The second is an "internal psychological process of elaboration and

acquisition" (Illeris, 2018, p. 2). Theories of learning often focus on only one of these two processes, which can be used to explain why learning may be unsuccessful. For example, a teacher may be explaining a concept to students. The teacher may focus on achieving clarity of delivery, yet if the internal psychological process of learning is not engaged, the learning will be ineffective. One way of interpreting successful learning is when the possibly substantial gap between recognising information and understanding it is bridged, enabling a student to reconstruct material in a new context (Light et al., 2009). My research has involved evaluating a way to bridge this gap but acknowledges that, as Orru and Longo (2019) assert, "learning is a hard process, it is hard to evaluate it mostly because it is perceived as a subjective one" (p. 44). Researching learning has proved to be challenging.

Placing a visual metaphor on a slide at the point in the lecture when a new concept is introduced may unlock meaning in real-time and enhance the flow of the lecture. Displaying the concept's name helps secure the important pedagogical issue of ensuring that learners have seen the word for the concept in English. According to Willingham (2023), a psychologist who conducts research into the application of neuroscience findings to learning, if students want to learn from lectures, they need to avoid listening to the delivery of content in the way that they would listen to a friend speaking. This passive approach will fail to appreciate the deeper connections that the lecturer is attempting to communicate. Carefully selected visual metaphors, in conjunction with the judicious use of words may help to foster these deeper connections.

However, it is important to stress that the overuse of visual metaphors must be avoided. The subtle movement from visual metaphor to formal academic exposition must be carefully managed in such a way that learner attention is preserved. Visual metaphors are also not always suitable for helping to unlock meaning. A poor or misleading visual metaphor may confuse learners. In this situation, a literal representation may be more appropriate, or a more traditional text or diagram-based approach might be more effective. If the contextual transfer is difficult using the chosen visual metaphor, it may cause confusion rather than supporting understanding. It is

worth noting that practitioners should avoiding using images that have no pedagogic value but are merely interesting to look at: “seductive graphics do their damage by grabbing and holding the learner’s limited attention” (Sung & Mayer, 2012, p. 1618).

When selecting images, practitioners should be mindful of the cultural backgrounds of their students. Choosing images that are drawn from students’ cultures can be valuable and enabling learners themselves to make these choices is likely to be even more effective. This powerful way of informing and enhancing practice reflects the cyclical nature of AR as a methodology; *better* image selection is unlikely to be a destination but may be better viewed as an ongoing process.

To summarise, and in line with the overarching message of this thesis, when visual metaphors are used effectively, they may help to communicate and *unlock meaning*. They do not provide a comprehensive and detailed understanding of abstract concepts. Instead, they should be treated as an initial stage of learning. Instructional design can be enhanced by capitalising on existing knowledge (Mayer, 2009) and visual metaphors are a way of doing this.

6.5 Informing My Practice

The research findings have informed my teaching practice and planning. More effective images have replaced ineffective images in lectures. For example, the image of Mr Spock, used to represent the concept of rationality, being replaced by an image of a robot (a discussion of the rationale behind this substitution is provided in section 5.3 - Theme 1). Another example is the image of the penguins, used to represent the concept of subculture, being replaced by an image of a punk (a discussion of the rationale behind this substitution is provided in section 5.3 - Themes 1 and 5). These are examples of many image substitutions based on feedback from and image provision by participants.

My intention when undertaking this research was to enhance the quality of my practice. Working with my students to find how visual metaphors help them understand abstract concepts and what types of images are most useful for this purpose has enabled me to understand more about my own practice and when it is effective and ineffective. As practitioners we hold the power in terms of instructional design. We have latitude to decide how to teach and, often, what to teach. However, when deciding how to teach we make subtle choices about what we believe to be effective or ineffective. Arguably HE practitioners' practice is strongly influenced by their beliefs about what effective teaching involves, which may be based on their own experiences of education and what *worked for them* (Mofreh & Ghafar, 2019). I hope that I have demonstrated how valuable it can be to harness the enthusiasm in insights of learners to help support the development, and refinement, of instructional design.

As explained in section 6.2.3, metaphor elicitation was used primarily to collect data but was unexpectedly effective at helping students understand concepts in a simple and enjoyable way. I will continue to use the technique and plan to conduct further research into why the method is effective and how this effectiveness can be maximised (see section 7.4). Ultimately, the primary focus of my teaching is to prepare international students for postgraduate study. If the use of visual metaphors is helpful to them in gaining an understanding of abstract concepts and it can help create a stronger foundational base of threshold concepts. Consequently, their potential for success should be strengthened.

While there is an abundance of literature explaining the challenges faced by international students in western HE, and Chinese students in particular, there is a lack of research into practical, pedagogical tools that can better serve this group. At best, when examining educational research in this area "the link to pedagogy remains fuzzy" (Lomer & Mittelmeier, 2023, p.1244) and deserves greater attention. I am not simply a teacher of international students but am involved in preparing them to enter a system that is not very sensitive to their particular learning needs.

6.6 Conclusion

McNiff and Whitehead (2009) assert that one of the critical aspects of an AR study is that consideration is given to how the findings of the study are communicated to others. In doing so, the study's importance and contribution to knowledge are clarified. This chapter has summarised the research findings, presented them in what I hope is a clear and easy-to-understand form, and shown how they contribute to knowledge. The main contribution is based on the practical visual metaphor construction model, with smaller (subsidiary) claims related to developing process interviews as a data collection method and metaphor elicitation as a teaching technique. I have expressed some aspects of my findings as recommendations in the hope that this makes them less abstract and more useful to practitioners considering using my ideas in their instructional design or research.

Chapter 7: Conclusions

7.1 Introduction

This chapter summarises how, and the extent to which, the research questions have been answered. It also explains the implications that the research may have, for my own teaching practice and that of others. I will clarify what I believe are my contributions to knowledge, justify why they should be recognised as such, and will suggest where future research could make further contributions. This chapter is also an opportunity to reflect on the research process and how it has affected me, my practice, my students, and those who were participants.

7.2 Answering the Research Questions

My research aimed to answer three questions. As explained in section 3.5, *outcome validity* (Heikkinen et al., 2012) is based on the research findings being able to answer the research questions. Below, I explain how and the extent to which they have been answered.

Answering RQ1: How can I work with my international postgraduate management students to better understand their learning experiences and so enhance my practice of selecting and using visual metaphors in lectures?

This question was about finding ways to work with my students to design and undertake a complex piece of qualitative educational research in a way that generated relevant and meaningful data. Asking students to talk about their learning has required imagination and innovation in terms of research design and data collection methods. The focus groups used in Phase 1 provided useful, if relatively thin, data. The metaphor extension activities also provided only basic data and did little other than

show that participants could make a connection between the source and target domain.

The process interviews used in Phase 2 were an effective method for overcoming the metacognitive challenges of explaining learning. They generated data on how and why certain visual metaphors contributed to learning while others did not. Metaphor elicitation and the phased narrowing exercise provided further insights into my learners' thought processes and culture and enabled participants to choose which images *they* thought were most effective at representing concepts. As well as proving to be an unexpectedly enjoyable and seemingly pedagogically worthwhile technique, metaphor elicitation enabled my students to show me aspects of their culture and life that I would not otherwise have been exposed to. This was a privilege for me while they expressed the view that they enjoyed sharing images drawn from their culture and, most importantly to them, enjoyed seeing that I was genuinely interested in these images. This helped fuel their enthusiasm for participating in my research and contributed to the high Phase 2 participation rate and generally positive classroom atmosphere. Gaining their enthusiasm and trust through this process has generated richer and higher-quality data; they wanted to help and work with me. Recognising that I was willing to accept that *my* image choices might not be the most suitable enabled them to see that my curiosity and determination to enhance my teaching were genuine.

I suggest that other practitioners with misgivings about working with students to enhance their practice should be open to the approach. Students know we are imperfect and have valuable insights into how our instruction could be better designed. Techniques such as metaphor elicitation are not time-consuming for participants and may provide valuable learning opportunities.

Answering RQ2: To what extent can the choice and use of visual metaphors communicate the meaning of abstract concepts to international postgraduate management students, enhancing their learning experience from lectures?

This question was about investigating whether visual metaphors would be useful to communicate the meaning of abstract concepts in lectures and, if so, in what ways they would be most impactful. Phase 1 provided some foundational evidence that learners valued the communicative power of visual metaphors to provide meaning, while Phase 2 explored the more complex issues related to why certain types of images might be more impactful than others and how they could be used for the greatest effect. In short, Phase 1 explored the *what*, and Phase 2 explored the *why*.

Answering RQ3: How might understanding the communicative value of visual metaphors help to enhance professional practice and the student experience of HE?

This question was about making practical, pedagogical use of the research findings in a way that would help to enhance my practice. A model of the facets of strong visual metaphors has been built (see section 6.3). This model provides a framework for creating visual metaphors more likely to be effective at unlocking meaning when practitioners are attempting to communicate complex or abstract ideas to their learners. The model contains eight facets, three of which have been identified as essential for unlocking meaning: familiarity, relatability and connectability. The other five facets can be used to strengthen the visual metaphor.

The context in which the teaching and research has been conducted has been an important consideration here. However, it has been clear from feedback at conferences that the model resonates with teachers in a range of educational contexts (see section 3.5.2).

Although the findings and recommendations from this research are not generalisable, they resonate with practitioners who are also seeking to enhance their practice, and that of others, and overcome a common instructional design problem - how to communicate complex or abstract ideas and concepts to students. As McNiff and Whitehead (2009) assert, as an action researcher I cannot realistically claim to have changed more than my own practice but can justifiably “speak about influencing

others' thinking and practices" (p. 60). Ryan and Carroll (2005) use the metaphor of international students being the "canaries in the coalmine" (p. 9) whose difficulties should alert practitioners to wider problems that deserve attention; the "canaries" should help to "point out difficulties in our teaching that all students will probably experience as challenges" (p. 9). By focusing on improving pedagogy for this, vulnerable, group, pedagogy for all students should improve.

It is relevant to note that it has not been necessary for my participants to understand the concept of metaphor or visual metaphor to contribute to the research or to benefit from using visual metaphors to support learning. The word *metaphor* itself is an abstract noun (Sword, 2012), so insisting that learners understand the concept would have created an unnecessary obstacle to their participation (and learning).

7.3 Defending My Contributions to Knowledge

While what constitutes originality in doctoral knowledge generation is not agreed upon (Baptista et al., 2015), it is an essential element of the thesis and is usually associated with creativity or innovation (EUA, 2010). What is regarded as significant or sufficient originality varies by subject and has changed over time. As Baptista et al. (2015) assert, what would be considered significant originality in the 21st century would be very different from the 19th century. The former may be characterised by being smaller, highly specific or nuanced. I imagined that this would be a description of my contributions but, as has been explained, I have been delighted that my findings have found validational resonance with a diverse range of practitioners.

McNiff and Whitehead (2009) emphasise the importance of external validation for action researchers. They stress how it is important to show that, "It has involved testing your provisional claims to knowledge (asking other people to look at your work, listen while you explain why you think it is good, and give you feedback about whether you need to rethink some aspects)" (p. 12). I have included quotations provided by delegates from conferences and symposia I have presented at in section 3.5 (and

elsewhere in this thesis) to defend my arguments and claim a high level of external dialogic validation.

Originality might take the form of employing existing knowledge and applying it in a new context to generate new understanding (Baptista et al., 2015); this is what I have done by investigating how visual metaphors can be used to the greatest effect. I have also made recommendations about how visual metaphors can be constructed and used, presenting this in the form of a model and associated depiction (Figure 53) this constitutes an original contribution to research implementation (Lovitts, 2007) by explaining how to operationalise the research findings. The depiction of the model is designed to help communicate my ideas to others. Reassuringly, Thomson and Kamler (2016), when discussing expectations of originality, explain that "The contribution that is asked for is relatively modest, but is something where clarity of thought and rigour in process is conveyed through a well-expressed, well-organised thesis" (p. 18). The model described in section 6.3 is my primary contribution to knowledge.

New research methods and approaches can also be a feature of doctoral originality (Guetzkow et al., 2004). The development of process interviews has been externally recognised as a valuable, culturally sensitive, contribution to the field of educational research. I would also argue that providing new knowledge of significance to my academic field (Tinkler & Jackson, 2004) has been achieved in that I have disseminated my ideas and received positive feedback and validation from peers through conference and symposia presentations (see Appendix 3), a blog (Cotterill, 2022a), and most significantly, peer reviews of and feedback on a paper written for CERJ (Cotterill, 2022b). Process interviews are my second contribution to knowledge, the reflective aspects of their development contributing to the process validity of the study (Heikkinen et al., 2012) with this thesis including a detailed explanation of what I did and how I did it (McNiff & Whitehead, 2009).

The third contribution to knowledge was unanticipated. I had planned to use metaphor elicitation (Coulter & Zaltman, 1994) primarily to collect data. However, it became

apparent in the Phase 2 interviews that the technique also helped students understand abstract concepts. By allocating students concepts and asking them to find images to represent them, a simple homework task can be created that will take little time to complete. When the images are presented in a seminar, an accessible and fun way of finding meaning emerges. The competitive element of knowing that the image they found will be presented to the rest of the class for explanation quickly manifests itself once students see how the process unfolds. This helps to enhance the quality of the process as students attempt to find clever and interesting visual metaphors designed to impress their classmates and the teacher. I have identified metaphor elicitation - as a teaching method - as an area for further research, which is discussed in section 7.4.

McNiff and Whitehead (2009) explain the aim of the *research* element of AR is to create theory that is capable of explaining the action. The *action* part of AR may have helped to enhance my practice, but the new theory enables this process to be explained in a structured format that might be better understood by others. By producing the model explained in section 6.3 I have created a disseminatable theory of how effective visual metaphors should be selected.

7.4 New Questions Emerging

As an action researcher, I know that my research does not and should not reach a clear end (Heikkinen et al., 2012). “Qualitative researchers are always thinking, reflecting, learning and evolving - we do not reach a point where we have nothing more to learn” (Braun & Clarke, 2019, p. 592). I have found sufficient data to contribute to knowledge and broadly answer my research questions. However, through the processes of research, analysis, and evaluation, four issues for further research have emerged:

1. Metaphor elicitation was used in Phase 2 as a data collection method. This proved to be an effective way of gaining further insights into participants' image choices and preferences and provided material to support interview

discussions. However, it was clear that participants had enjoyed the process of finding images, had taken it seriously and had been able to find meaning in the concepts they had been allocated (see Theme 6 in section 5.3). This added another unintended dimension to metaphor elicitation: it can be used as a teaching method. As an enjoyable technique that is not time-consuming, metaphor elicitation can be used to help students find meaning in complex, abstract concepts. It appears to be another way to enhance practice, although I would add a degree of "provisionality" (McNiff & Whitehead, 2009, p. 27) to this claim. Better insights into *how* and *why* metaphor elicitation is effective would be a valuable further contribution to knowledge and are therefore worth further exploration.

2. A factor briefly explained in section 5.3 (Theme 3) was the use of video to support understanding or present a visual metaphor. It is possible that using video would be a more powerful way of communicating verbs or abstract concepts where movement or action is a feature. Although there are technological hurdles to overcome to make this an efficient and effective feature of lectures, this would be worth further investigation.

3. The type of visual metaphor that I have been primarily focused on is what Phillips and McQuarrie (2004) term a *replacement metaphor*. This is distinguished from *juxtaposition* and *fusion metaphors*. The latter two are often used in advertising and involve placing two objects alongside each other or blending two objects. Juxtaposition and fusion visual metaphors may involve complex image manipulation techniques using software such as Photoshop (Safko, 2021). With a replacement visual metaphor, an image is shown (or presented) and *implies* the target domain (Phillips & McQuarrie, 2004).

   Advances in generative artificial intelligence (AI) mean that producing bespoke images as visual metaphors is becoming possible, without relying on the services of a graphic designer. Software such as Night Cafe is able to generate high quality images based on text input alone (Qiu et al., 2022). Other recently

launched generative AI, such as Dalle.E2, Midjourney and RealityScan, offer a high level of flexibility for original image production. Creating a sophisticated hybrid visual metaphor in which “target and source domain are combined in a single ‘gestalt’” (Mulken et al., 2010, p. 3419) is becoming increasingly feasible and economical. Consequently, the creative imagination of practitioners, and their students, to combine elements from a range of sources into single images will potentially further enhance the scope for visual metaphor use. The ability of students to generate images for metaphor elicitation purposes will also be enhanced, permitting the kind of creative freedom previously afforded to research involving other creative media (Kara et al., 2021).

AR would be particularly appropriate for investigating the pedagogical potential of these technological developments. Development, testing and evaluating instructional materials and student evidence (all created through AI) would fit well into an inquiry structured in the same way as mine. Process interviews would also be a suitable way to collect data in such an inquiry as the images could be incorporated into the tasks embedded within the interviews.

4. I did not formally evaluate how my use of visual metaphors impacted on the academic writing of my students. I noticed that students would occasionally make reference to a visual metaphor used in lectures; for example, when discussing in an examination answer the value of teamwork a student described how a group of ants is stronger than the sum of the individual members of the group. However, use has been rare, reflecting Mouraz et al.’s (2013) conclusion that students are reluctant to make use of metaphorical language in their writing. It would be interesting to see how effectively students could weave metaphorical reasoning into their writing when actively encouraged to do so, drawing on the examples used in instructional materials.

Finally, it would be interesting to know how helpful the use of visual metaphors has been in terms of the transition my students have made to the UNE School of

Management. Given that I have attempted to help them find meaning in threshold concepts (Meyer & Land, 2003) I would like to know the extent to which this grounding eased their transition and strengthened their ability to access the teaching. Such research would, however, be a huge logistical and methodological challenge.

7.5 Reflections, Successes and Uncomfortable Truths

Conducting this research has achieved what Arnold and Norton (2018) argued is possible through AR: I have become closer to my students, discovered more about their culture, discussed their feelings about education and learning and reduced the power distance (Kasuya, 2008) between us; this has enabled me to answer, and move beyond, RQ1. My students have seen that I am genuinely interested in enhancing my teaching and doing what is best for them. This improved the level of trust and respect between us and positively contributed to classroom dynamics and student motivation. We have valued each other (Doyle, 2022). As participant M6 stated when I shared the model with her, “I am very honoured to have been involved in your research”. Therefore, reflecting on the research, I can see clear benefits in how to enhance my practice, but I can also see the benefits of engaging my students in the research process. Using an AR methodology has been an effective way to find ways to improve my practice in a structured (but flexible) way; as McNiff and Whitehead (2009) assert, “Action research lends a new dimension, because it is about processes of improvement, and making claims that something has improved” (p.11).

I had been concerned about the impact my research might have on the learning process: would it be time-consuming and a distraction from the primary aim of my teaching - to help my students learn and progress? The opposite has been true. My students have, almost without exception, been enthusiastic and critical participants. I would like to think that while I have learned much from them, they have also learned about designing research and employing research methods, which should be valuable to them in their postgraduate studies. My justification for using AR (explained in section

3.4.3) included the aspiration that the research process itself would have a positive impact on the quality of the learning experience and it seems to have achieved that.

Although I have attempted to create a model that might resonate with others, beneath this exists multiple individual voices from participants. Arguably, those presenting research findings sometimes attempt to create a monolithic view (Cook-Sather, 2006), but amongst my findings, there are clearly varied, often distinct, opinions and views. Image choices, for example, cannot be ubiquitous. I have attempted to represent diverse views in my analysis and have tried to ensure that the TA process and reporting has not hidden individual voices and opinions.

As I moved through the cycles of the research, I adapted my analytical approach, using a simple deductive analysis (Pearse, 2019) for the Cycle 1 focus group data, framework analysis (Gale et al., 2013) for the interviews with postgraduate education students, and TA (Braun & Clarke, 2021b) for the remaining qualitative data. With each shift I was responding to the increasing complexity of the data and was striving to ensure that the chosen analytical approach was most appropriate for finding meaning in the data.

I worked hard to find innovative ways to collect data and overcome difficulties with the research and data collection process. Discussing learning in a meaningful way with students is extremely challenging, particularly so when the students are speaking a second language. Aside from the metacognitive demands associated with such discussions (de Blume et al., 2017) evidence also suggests that learners may be poor at judging when learning has been successful, particularly if non-traditional instructional techniques have been used (Deslauriers et al., 2019). Some of my research approaches, such as process interviews and metaphor elicitation, have been successful at helping to overcome these problems. However, AR should not be a victory narrative (McDonagh et al., 2022), and it is essential to acknowledge deficiencies in the research and what it has been unable to do (Thomson & Kamler, 2016). As a researcher who has attempted to embrace reflexivity, acknowledging ‘uncomfortable truths’ should help strengthen my research's rigour (Boyle et al., 2022).

McNiff and Whitehead (2009) explain the importance of how we should not “gloss over the difficulties in our enquiries, but face them honestly” (p. 34).

The use of metaphor extension exercises in seminars provided very little useful data. I had hoped that the activities would allow an insight into how far participants could push a metaphor beyond a simple target domain - or extend it (Semino, 2008). However, with some exceptions, contributions generally provided little more than the basic metaphorical connection. The quantity and quality of data collected would certainly be insufficient to construct a model of metaphor extension. The pedagogical value of metaphor extension activities seemed to far exceed the research value.

I was disappointed by the quantity of written dialogic feedback (McAteer, 2013) I was able to obtain following conference presentations, and from the Advance HE blog (Cotterill, 2022a) and CERJ paper (Cotterill, 2022b). I have included quotations from written feedback in this thesis, but I had hoped to have had access to more. At conferences, I provided a QR code link to a Google Form and encouraged delegates to provide feedback. However, although I had plenty of post-presentation questions and delegates who wanted to talk to me after the sessions, obtaining written feedback was problematic. This may have been because people were too busy or because I had emphasised that I wanted to use their comments in my thesis. Oral feedback was overwhelmingly positive, but I had hoped that more of this feedback would also be made in writing.

7.6 Conclusion

Although there is a wealth of academic research into the pedagogic use of metaphors in discourse, there are very few insights into the use of visual metaphors. The existing body of knowledge suggests that visual metaphors are useful to support learning but does not explore how or provide guidance on selecting and incorporating images into instructional design. My research has made an original contribution by producing a

model that can be used to construct powerful visual metaphors. I have also provided guidance on how best to incorporate visual metaphors into lectures.

The participants in my research were all international students, most of whom were from China. These students are extremely valuable to the UK economy and UK HE but are identified as a group that finds accessing learning challenging. Greater attention should be given to pedagogy - instructional design and assessment methods - and how they can be adapted and enhanced to accommodate better and support international students and their learning experience. There is also much to gain by harnessing the cultural capital of international students. My research findings and the model offer practitioners one way to do this.

There is also very little guidance available in the existing literature on how to best conduct research in HE with international students. When students are operating in a second language and being asked to discuss complex concepts and issues, the challenges for participants and researchers are immense. The development of process interviews has, to some extent, helped provide a way to overcome these challenges.

As an experienced teacher, exploring how to enhance my professional practice has been rejuvenating. I have found ways to make my instructional design more effective and have been pleasantly surprised to see how my ideas resonate with other practitioners. I have learned to become a practitioner-researcher (McNiff & Whitehead, 2009) who understands how to work *with* my participants and the powerful way in which this can transform and enhance practice. I have also enjoyed exploring the use of AR and, through CARN and ARNA, becoming part of the highly supportive action researcher community. As a research methodology, AR has proved to be valuable for not only enhancing practice, but to reduce the distance between me, the practitioner, and my students.

The level of enthusiasm and genuine interest that my students have demonstrated for my research has been astonishing; my relationship with them became stronger as they

saw how interested I was in improving the quality of their educational experience and because they could see that I valued their contributions and respected their insights and opinions. Lomer et al. (2021) explain the significance of the relationship between a teacher and their students, and how it is particularly “important for encouraging successful teaching with international students” (p. 27). Reflecting on some of the problems, academic and non-academic, that international students experience (discussed in section 1.4.1) I can see how my students would place particular value on this relationship being strong. Being honest about the gaps in my knowledge seems to have been appreciated by my students rather than viewed as a weakness. Allowing them to have direct and tangible input into instructional design reflects Lomer et al.’s (2021) argument that “student partnerships can be radical ways to change curriculum and pedagogy” (p. 30).

Ultimately, this research has been about my desire to be a better educator but has also involved me learning how to be a better researcher, and action researcher. McNiff and Whitehead (2009) articulate this process: “the claim you make through doing your action research is that you have improved your practice. This began by improving your learning. Both these aspects happened because you learned how to do research into your practice” (p. 43).

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Appendix 1: Participant Codes

Data form and source	Code pattern	Example
Transcriptions from focus groups and process interviews	Cycle-Group	4-3C (Cycle 4, Group 3C)
Framework analysis data from interviews with postgraduate education students	PG followed by participant number	PG4 (Postgraduate 4)
Answers to follow-up questions	Q followed by participant number	Q5 (Participant number 5)
Metaphor extension activities	S-Group-Cycle	S-2-3 (Group 2, Cycle 3)
Phased narrowing feedback	PN followed by participant number	PN5 (Participant number 5)
Feedback on model	M followed by participant number	M5 (Participant number 5)

Appendix 2: The Boredom Factor

Clark (2008) asserts that university lectures “can be notoriously boring” (p. 39), an assertion supported by research into student perceptions (Sharp et al., 2021). Throughout my research, for this inquiry and in previous research projects, when participants have described their obstacles to learning, the word *boredom* has been frequently used. A powerful argument is that, due to this boredom, students do not engage with or are receptive to lecture-format teaching (Gilroy, 1998). As a result of boredom, students may find lectures ineffective as their situational interest may be low, resulting in them giving little attention to the material presented (Weinstein et al., 2018).

Mann (2016a) argues that we often confuse boredom with other emotions, such as tiredness. However, a recognisable definition of boredom for teachers (and students) is that someone is bored when “what they are meant to be doing does not appeal or keep their attention” (Mann, 2016a, p. 4). Alternatively, boredom can be defined as having nothing to do that one likes to do or being in a situation that lacks stimulation (Fiske et al., 2012). As such, boredom is associated with words such as *tedium*, *monotony* and *dullness*, all words that are the antithesis of stimulating and effective.

Boredom is generally associated with tasks that lack meaning. It has been argued that humans actively seek meaning in what is presented to us and that when we cannot establish meaning, we experience boredom (van Tilburg & Igou, 2012). Fisher (1993) believes that boredom is a transient state in which someone lacks interest in an activity, finds it difficult to concentrate, and struggles to find resonance or meaning in material. A key feature of boredom is that the individual feels that they are experiencing a lack of stimulation and, thus, in their frustrated state, seeks arousal from other sources (Mann, 2016a). In such a situation, an individual may require much effort to sustain concentration. If instructional material is boring, then the initial stage of attending to information will be weak, reducing the likelihood of working memory being engaged to seek meaning and begin the creation of new knowledge.

Many students find our lectures uninspiring regardless of what we, as educators, might think. A survey of UK university students in 2004 suggested that 27% have fallen asleep during lectures, with boredom being cited as a critical reason for this (Hodges, 2004). Mann and Robinson (2009, p. 250) found that 59% of students regard lectures as boring half of the time, while 30% regard this to be true most or all of the time.

It is difficult to understand the significance of boredom and how it interacts with other factors, such as the intrinsic difficulty of material (Leppink et al., 2013). One explanation for why there has been so little research into classroom boredom is that the emotion is relatively benign (Preckel et al., 2010). As explained earlier, a problem with the concept of boredom is that it is often confused with other emotions. For example, if students find work too challenging, they may describe the work as boring (Fisher et al., 2014). Unsurprisingly, students who rate themselves as being often bored with their learning experience achieve worse academic outcomes than those who are only sometimes bored (Mikulas & Vodanovich, 1993).

The lack of stimulation that some students perceive, and describe as a feeling of boredom, may be due to high expectations of stimulation (Mann, 2016a). Making teaching materials accessible and attractive to students can be a way to reduce perceived boredom (Liaw, 2004) and thus improve instructional design. In the context of lectures, if techniques are used that encourage students to pay attention to the material as it is introduced, the perceived boredom may be reduced, and the efficacy of the learning experience improved. In their annual survey of lecturers at two large UK universities, Fry et al. (2008) found that lecturers themselves consistently ranked “making the material you are teaching stimulating and interesting” (p. 33) as the most important feature of good teaching.

Irrespective of how significant the boredom factor is, if students lack engagement with the material, their weak attention will make the processing and assimilation of content more difficult. Students who report high levels of boredom are likely to engage in only superficial or surface learning (Sharp et al., 2021). Furthermore, according to Mann (2016a), students who find lectures boring, somewhat unsurprisingly, are more likely

to absent themselves. Thus, reducing perceived boredom, although challenging to calibrate, is a logical goal for a lecturer. Notably, “arousal may be affected by the meaning of the situation” (Mann & Robinson, 2009, p. 244), so without arousal and the ability to find meaning in instructional materials, boredom and detachment from the learning experience are likely.

Appendix 3: Conferences and Symposia Attended

Higher Education Academy (Advance HE) – Conference on Advanced Research Methods in Education - (Manchester, 28/4/22) - Presentation entitled: *Pushing metacognition - Talking to international students about their learning*.

Oxford Brookes Doctoral Education Colloquium - (Online, 18/6/22) - Presentation entitled: *Pushing metacognition - Talking to international students about their learning.*

Action Research Network of America - Annual Conference 2022 - (Cedar City, Utah, USA, 28-30/6/2022) - Workshop session: *Unlocking meaning - using visual metaphors in lectures.*

International Conference on Advanced research in Education, Teaching and Learning - (Dublin, 29/7/22) - Presentation entitled: *Unlocking meaning - using visual metaphors in lectures*.

Collaborative Action Research Network Conference 2022 - (Dublin, 28-30/10/22) - Presentation entitled: *Unlocking meaning - using visual metaphors in lectures.*

University of York Learning and Teaching Conference 2023: Supporting the Student Journey through Learning and Teaching (York, 22/6/23) – Presentation entitled: *Unlocking meaning using visual metaphors*.

Forthcoming:

Exeter University Symposium – International Student Experience (Online, 22/2/24) – Presentation entitled: *Talking about learning with international students: insights using process interviews and metaphor elicitation*.

Appendix 4: Participant Information Sheet: Phase 1

University of Huddersfield
School of Education and Professional Development

Participant Information Sheet (E3)

Research (working) Project Title: Illustrating metaphor and analogy: An evaluation of the learning that takes place in lectures when images are used to support metaphors and analogical reasoning: an action research approach, working with international postgraduate Management students.

What is the purpose of the project?
The purpose of the research is to explore the way in which the use of images to support metaphorical and analogical reasoning is perceived to impact upon learning. The research is for my Doctorate in Education (EdD) at the University of Huddersfield.

Why have I been chosen? Students from the Introduction to Management (January 2021 start) cohort have been invited to participate.

Do I have to take part?
Participation in this study is entirely voluntary, so please do not feel obliged to take part. Refusal will involve no penalty whatsoever and you may withdraw from the study at any stage without giving an explanation to the researcher.

What do I have to do?
You will be invited to complete an online questionnaire and to take part in a focus group. The focus should take no more than 30-60 minutes of your time.

Are there any disadvantages to taking part?
There should be no foreseeable disadvantages to your participation. If you are unhappy or have further questions at any stage in the process, please address your concerns initially to the researcher if this is appropriate. Alternatively, please contact my research supervisor Professor David Powell at the School of Education & Professional Development, University of Huddersfield (d.powell@hud.ac.uk).

Will all my details be kept confidential?
All information which is collected will be strictly confidential and anonymised before the data is presented in the assignment, in compliance with the Data Protection Act and ethical research guidelines and principles.

What will happen to the results of the research study?
The results of this research will be written up in an assignment and presented for assessment as part of my doctorate. If you would like a copy please let me know.

Who has reviewed and approved the study, and who can be contacted for further information?
The research supervisor is Dr David Powell. They can be contacted at the University of Huddersfield.

Name & Contact Details of Researcher:

Richard Cotterill
[redacted]

Appendix 5: Participant Consent Form - Phase 1

University of Huddersfield

School of Education and Professional Development

Participant Consent Form (E4)

Title of Research Study: Illustrating metaphor and analogy: An evaluation of the learning that takes place in lectures when images are used to support metaphors and analogical reasoning: an action research approach, working with international postgraduate Management students

Name of Researcher: Richard Cotterill

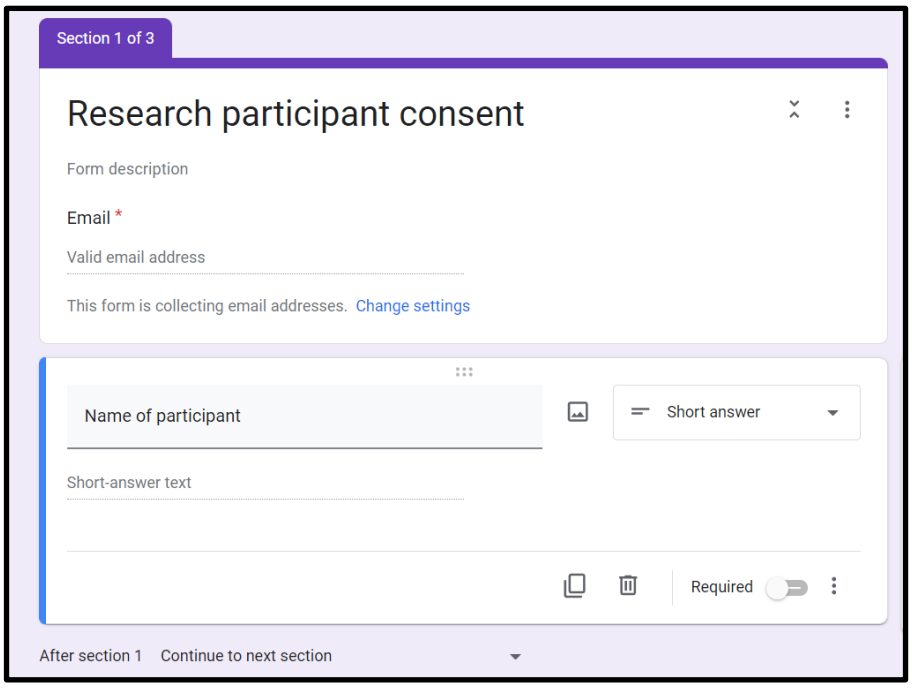
Participant Identifier Number:

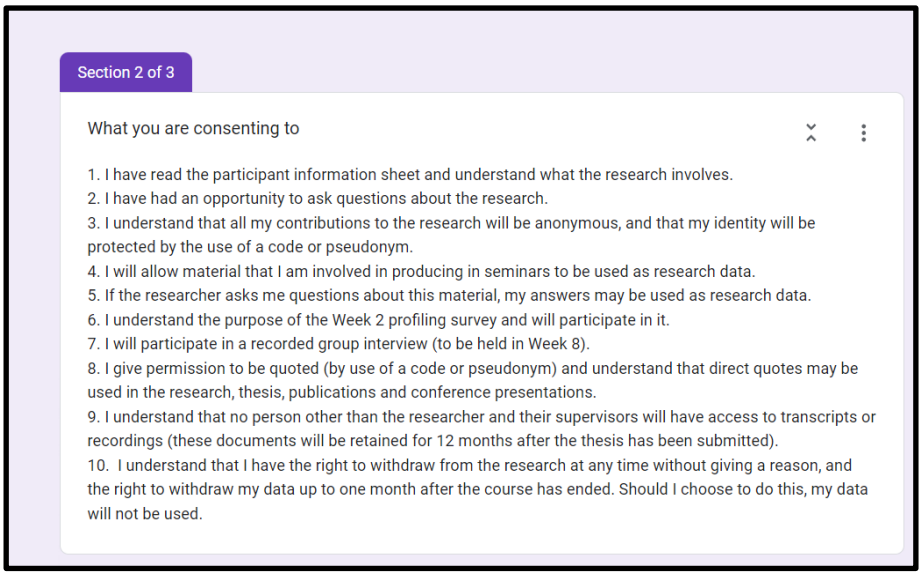
- ❑ I confirm that I have read and understood the participant Information sheet related to this research, and have had the opportunity to ask questions.
- ❑ I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.
- ❑ I understand that all my responses will be anonymised.
- ❑ I give permission for members of the research team to have access to my anonymised responses.
- ❑ I agree to take part in the above study.

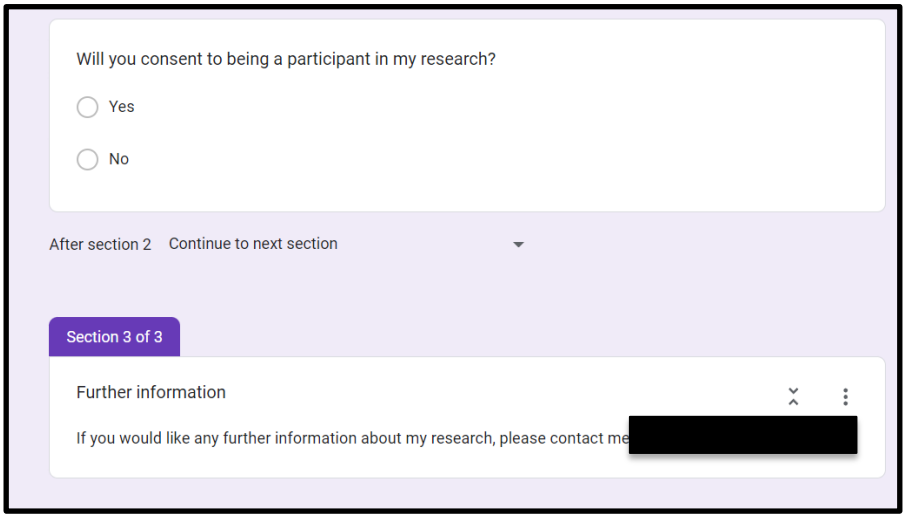
Name of Participant:

Date:

Appendix 6: Participant Consent Form - Phase 2






Will you consent to being a participant in my research?
Yes
No
After section 2
Continue to next section
Section 3 of 3
Further information
If you would like any further information about my research, please contact me

Appendix 7: Blank Centre Approval Form

University of Huddersfield

School of Education and Professional Development

Researcher Consent Form (E5)

This form is to be used when consent is sought from those responsible for an organisation or institution for research to be carried out with participants within that organisation or institution. This may include schools, colleges or youth work facilities.

Title of Research Study:

Name of Researcher:

School/College/organisation:

Describe

i) the purpose of the research study

ii) the data collection methods to be used

iii) which pupils/groups/classes will be selected for this study.

I confirm that I give permission for this research to be carried out and that permission from all participants will be gained in line within my organisation's policy.

Name and position of senior manager:

……

Signature of senior manager:……

Date: ……

Name of Researcher: ……

Signature of Researcher: ……

Date: …….

Appendix 8: Qualtrics Questionnaire - Cycle 1

Lectures

I am interested in understanding your experiences and expectations of lectures. Please be assured that your responses to this questionnaire will remain **completely anonymous**.

The questionnaire should take you around 10 minutes to complete. Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice. If you would like to contact me to discuss this research, please e-mail me at [redacted]

By clicking the 'I consent' button below, you acknowledge that your participation in the study is voluntary, you are over 18 years of age, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

Thank you

Richard Cotterill

- ○ I consent - I wish to participate
- ○ I do not consent - I do not wish to participate

Q1. Where did you complete your first degree?

- ○ Mainland China
- ○ Hong Kong
- ○ Taiwan
- ○ Japan
- ○ Korea
- ○ Other (please state)

Q2. What subject did you major in at university?

- ○ Business or Management
- ○ Economics
- ○ Mathematics or Statistics
- ○ Other (please state)

Q3. When you completed your first degree, how frequently were the following used in the lectures you attended?

	Never	Sometimes	Often
Photographs or images	○	○	○
Video	○	○	○
Diagrams	○	○	○
In-lecture questions	○	○	○

Q4. How would you **best** describe **your** expectations of the purpose of a lecture?

- ○ To introduce a topic
- ○ To provide some basic details of a topic
- ○ To provide a detailed explanation of a topic

Q5. Do the following, in **your** opinion, contribute towards the **effectiveness** of a lecture?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The use of photographs images	○	○	○	○	○
The use of video	○	○	○	○	○
The use of diagrams	○	○	○	○	○
In-lecture questions	○	○	○	○	○

Q6



Have you noticed that in my lecture slides I sometimes use photographs or other images to represent concepts?

- ○ Yes
- ○ No

Q7. How do **you** feel about the use of these images in my lectures?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
They make the lecture more interesting	○	○	○	○	○
They help me to remember concepts	○	○	○	○	○
They help me to understand the meaning of concepts	○	○	○	○	○

Q8. When you completed your first degree, were images like this used in lectures?

- ○ Never
- ○ Sometimes
- ○ Often

Q9. Do you have any comments about the questions in this questionnaire?

Characters remaining: 100

Thank you for completing this questionnaire

Appendix 9: Qualtrics Questionnaire - Question Block Added to Cycle 2

Q9. Images like these are also used as part of **seminar** activities. How do **you** feel about the use of images in this way?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
They make the seminar more interesting	○	○	○	○	○
They help me to remember concepts	○	○	○	○	○
They complement other seminar activities	○	○	○	○	○
They help me to understand the meaning of concepts	○	○	○	○	○

Appendix 10: Focus Group Guide for Cycle 1

Introduction

1. Brief explanation of the purpose of the research
2. Reassurance of anonymity
3. Participants sign consent forms

Discussion prompts

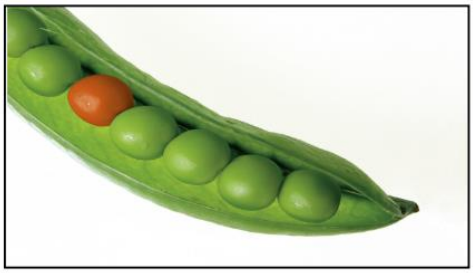
Area for discussion	Specific questions
The purpose of lectures *Can we talk about what you think lectures are for?*	● What do you expect to gain from a lecture? ● How much do you hope to learn from a lecture? ● What kinds of material can be presented effectively in lecture form? ● What are lectures not suitable for?
Learning in lectures *Can we talk about how you learn in and from lectures?*	● What do you understand about the term 'learning'? ● How do you learn from a lecture? ● How deep is the learning? ● What makes the learning possible? ● What enhances your learning experience in lectures?
Use of images - with examples *Can you tell me about how you feel about the images that are used in the Management lectures?*	● Do you recall what these images were used to represent? ● Do you like the inclusion of these images? ● Do they make the lectures more enjoyable? ● Do they help to support your understanding? ● How? ● Are any of the examples confusing? ● Why?

Appendix 11: Images Used in Cycle 1 Focus Groups





















Appendix 12: Focus Group Guide for Cycle 2

Introduction

1. Brief explanation of the purpose of the research
2. Reassurance of anonymity
3. Participants sign consent forms

Discussion prompts

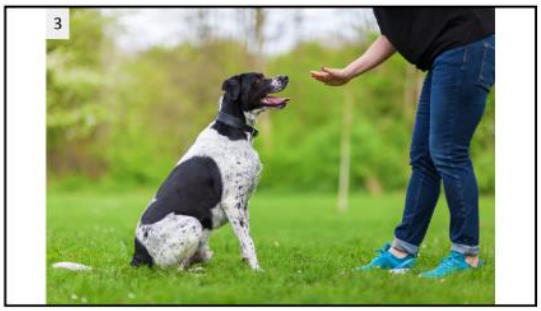
Area for discussion	Specific questions
Concepts exercise	● Cut and paste the words into the yellow box ● Can you explain your choices? ● Why are some concepts more difficult to explain than others?
Can I ask you about some images that you have seen before?	● Can you tell me what these images are designed to represent? ● Or… what meaning do they have? ● Which is the easiest to interpret? Why? ● Which is the most difficult to interpret? Why? ● How would you describe this type of image? ● How would you describe the type of concept that is being illustrated?
Can we talk about how you feel about the way these images affect your learning?	● When used, do they help you to understand a concept? Why? ● When used, do they help you to later remember a concept? Why? ● How would you know if they had a positive impact on your learning of a concept?
I'm going to show you some pairs of images - want to know what you think about how they compare	● How do they differ? ● Which is more helpful to achieve understanding of the concept? ● Which would be more memorable? ● Do you have a preference? Why? ● What about if both images were used?
Can we talk about the use of images like these in lectures?	● Do you like the inclusion of these images in lectures? Why? ● How do they impact on your enjoyment of the lecture? Why?

	● Are there too many/too few images in the lectures? ● Does the lecturer provide sufficient explanation of the images?
I would like to use these focus groups to explore the impact of these images on learning (recording turned off)	● Do you have any suggestions as to how I could do this more effectively? ● What could I change about the way I have held this focus group?

Appendix 13: Images Used in Cycle 2 Focus Groups

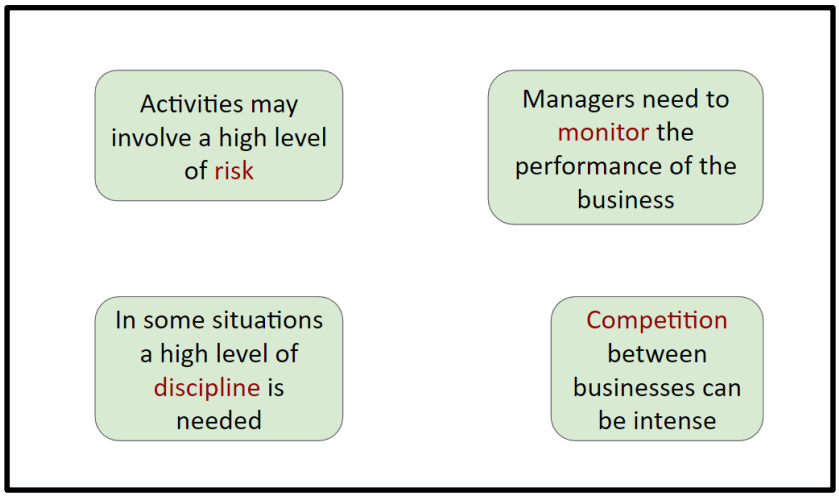








Appendix 14: Target Concepts Slide Used in Cycle 2 Focus Groups



Appendix 15: Comparison Exercise Used in Cycle 2 Focus Groups

Paternalistic leadership





Teamwork





Appendix 16: Interview Questions - Postgraduate Education Students

Part 1: Introductory questions

1. What is your nationality?

Questions relating to your undergraduate major:

2. In which country did you complete your undergraduate major?
3. What subject did you study?
4. Were lectures part of the teaching?

Questions relating to your MA/PG studies at [redacted]

5. Which MA course are you taking?
6. Have lectures been part of the teaching?

Part 2: Learning, knowledge, understanding

7. Explain what learning means to you
8. What do you believe is the difference between knowledge and understanding?
9. Is it possible to know and yet not understand? How and why?
10. Is there a difference between successful and effective learning? What is it? Can you give me some examples?
11. Apart from through exams and other assessments, how do you know when your learning has been successful?
12. How do you know when your learning has been effective?

Part 3: Learning in lectures

13. How do you learn in and from lectures?

14. How successful and effective is this learning?

15. Tell me what you think makes lectures effective?

16. What obstacles/barriers to learning might there be in lectures?

Part 4: The use of images

These images/pictures were used in Management lectures delivered to international students (four images shown)

17. What do you think was the purpose of using these images?

18. What do you think the lecturer intended each of these images to represent?

19. How do you think that using these images would affect learning (in and from the lecture)?

20. Can you describe the process of learning through these images?

21. Do you think some students might have problems understanding the point the lecturer is trying to make with any of these images? Please explain

22. Is there anything else you would like to say?

Appendix 17: Images Used in Interviews with Postgraduate Education Students









Appendix 18: Framework Analysis of Interviews with Postgraduate Education Students

Participant number	Background	Experiences of lectures	Learning	Learning, knowledge, understanding	Four images	Other relevant feedback
1	Chinese, BA English (in China), MA in Applied Linguistics	BA mainly taught through lectures, MA using Panopto recordings. Purpose of lectures is to obtain 'academic knowledge'. Some international students find lectures in English a challenge	Learning 'involves obtaining new knowledge'. Effective when can relay the structure	Learn by looking at notes. Difference between K and U depends on the level. U may be basic, K involves deeper perceptions. But U means I can relay K to someone else	When looking at images 'key words' come to mind. Appropriate interpretations of images. Very effective way of communicating ideas, particularly 'broad concepts'. Students have a wide variety of backgrounds, so this approach is useful	If the lecturer used images of people (e.g. Jack Ma) instead of ducks, students might think the lecture is a case study. Very little use of images in lectures in China. Interaction between students and teachers is more important in Education than in Management
2	Chinese, BA International Business	Taught through lectures in	The way I gain new K. Effective when I know I	Learn by reading and studying. Knowing something	Help to tell a story. Images seem connected. Very clear	Students have different ways of learning. Students from Asia are shy and

	and Management (in China), MA in Global Citizenship	China. Very challenging in English; easy to miss some key points	am obtaining new K or ideas. 'It feels different after the learning has been successful'	is when it becomes our own. But U is not necessarily the same as knowing. 'Understanding results in the K being my own'	and appropriate interpretations of the images. The images make the concepts more obvious. Also - increase attention and potential interest - 'easier for them to make a connection'	some find it very difficult to adapt to western teaching methods
3	Chinese, two BAs - Early Childhood Studies (in China), Early Childhood Education (US), MA Education	Lectures involve being given a brief introduction to concepts. Learning in lectures involves comparing what the teacher said with what I'm thinking	Based on life and books. Learning does not happen in school but in life when the K is used	Learn through teachers. K drawn from e.g. books but U happens by yourself. U involves using the K	The teacher is using them to provide big ideas about topics. They are useful	Learning in English can involve some misunderstandings. Teachers can provide useful illustrations of real world applications. MA does not take into account cultural differences e.g. applications of ideas to China
4	Chinese, BA in teaching Chinese to other nationalities	Lectures are very important for providing the 'main idea'	Learning involves obtaining 'professional K' e.g. from	'K does not mean that I understand it'. Some K is very complex and might not be understood.	The teacher wants the students to think about the concepts that will be part of the lecture. It is 'more	Use of complex words (in English) is problematic for international students.

	(in China), MA Education	behind a concept or topic. Too many slides makes lectures difficult. Don't like it when the teacher simply reads out the content of the slides	experts. When I learn I understand. It is successful when I pass exams	K can be used in professional work as a teacher to show U	easier to catch the concepts'. Provided basic interpretation of the pictures. Pictures are more interesting for students	
5	Chinese, BA Interpretation (in China), MA Education	In China the teachers just read out the contents of the PPT slides. Lectures main method of teaching on BA in China. In [redacted] the teachers include their own opinions	Learning is a process. When you learn something you are able to answer questions about it. You have really learned it when you are able to use it in your daily life or in your writing	Learn using books or notes. U involves knowing the meaning of something. U involves demonstrating that you can use the K	Useful to help introduce new words or to make them experience particular feelings. Suggested links between pictures, but provided basic interpretations of them. Useful to help show the big picture. Business examples:'I can't touch them', 'I can't get near them'	Teachers who include stories can make their teaching very memorable and interesting

		and do not just read out the slides				
6	Chinese, BA Accounting (in China), MA Education	Accounting course was almost entirely delivered through lectures. Listening to lectures helps me learn. Enjoy lectures when the teacher is passionate about the topic	I know I have learned something when I can put it into practice	U moves beyond the superficial. Can show ideas to others if U	Images cause different feelings. Different perspectives given and less boring, more creative and interesting to discuss later on. The images make learning easier, better than using business images	Value when teachers encourage students to ask questions however simple the questions might be. Chinese students are reluctant to speak in breakout rooms and turn off cameras
7	Chinese, MA Education	Prefer recordings of lectures to being in a lecture theatre. Can watch/listen several times.	Learning involves knowing something I did not know before. Can be used in the future. Learning is a	Learn using notes from lessons. Knowing is deeper than U. U is the surface but K is deeper. K means that I can teach someone	The images were used to obtain interest from the students. It creates attention as it is connected to what the teacher is going to say next. The colour	

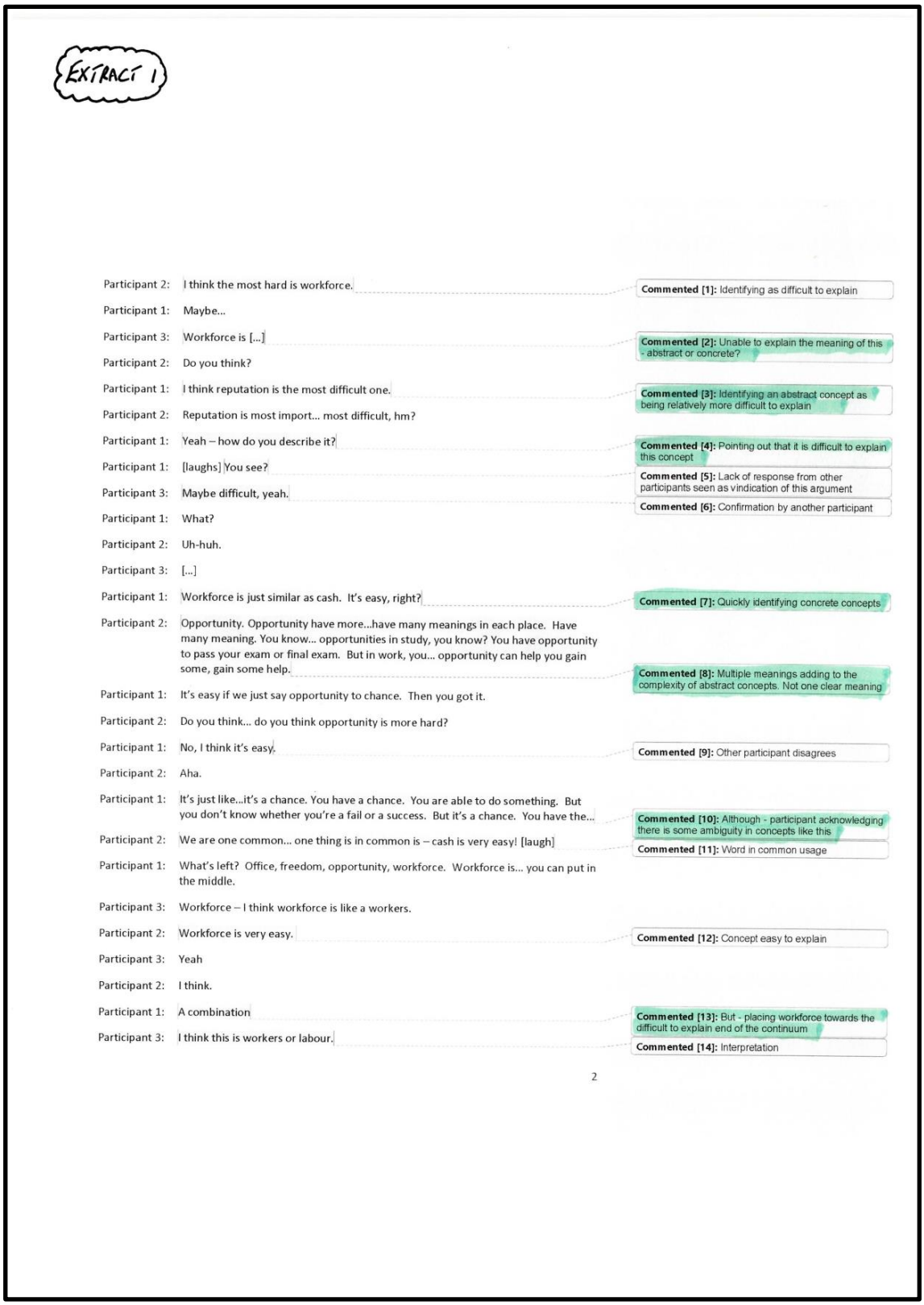
		Effective lectures involve the use of clear slides, with clear bullet points	long-term journey. I ask myself to establish whether I have learned something. Can I paraphrase something?		of pictures is effective. They make learning more active. Provided appropriate interpretations of all pictures except tightrope walker - suggested that this implies danger, but not necessarily risk	
8	Chinese, BA Business English (in China), MA Global Citizenship	Most of teaching in BA in China was through lectures. Effective when not too long with clear explanations. Prefer teachers to not just read out lecture slide content. Teachers using an interesting	Learning is a process - obtaining new K. being able to report back to others demonstrates successful learning. This could also be shown by being able to recall certain words	K is a 'basic thing'. If you want to use it you require understanding	They make the lectures more interesting and can be used to introduce certain topics. Broadly appropriate interpretations of the images. Don't think the value would depend on the students being international - useful to all. Better than specific, business-related images that might be relevant only to people from certain countries. Asking	Asking questions of students is helpful to learning

		(varied) voice is also useful			students about the images would be useful. These are students in HE so the images should not be confusing for them	

Appendix 19: Themes and Codes from Cycle 2

Theme	Key codes
What are the difficulties with explaining the meaning of abstract concepts?	Not real Not physical Ambiguity Multiple meanings Multiple interpretations
When are visual metaphors strong, or the approach helpful?	Is the target concept easily recognised? Does the image help with understanding of target concept Useful to communicate complex concepts? Is the approach helpful to international students? Animal images - anthropomorphism
When are visual metaphors weak, the approach not helpful, improvements needed/suggested?	Is the target concept ambiguous or not easily recognised? Multiple potential target concepts Image too subtle Image needs explaining Image incomplete or missing useful details Difficult to place in a business context Juxtaposition of business/non-business images confusing

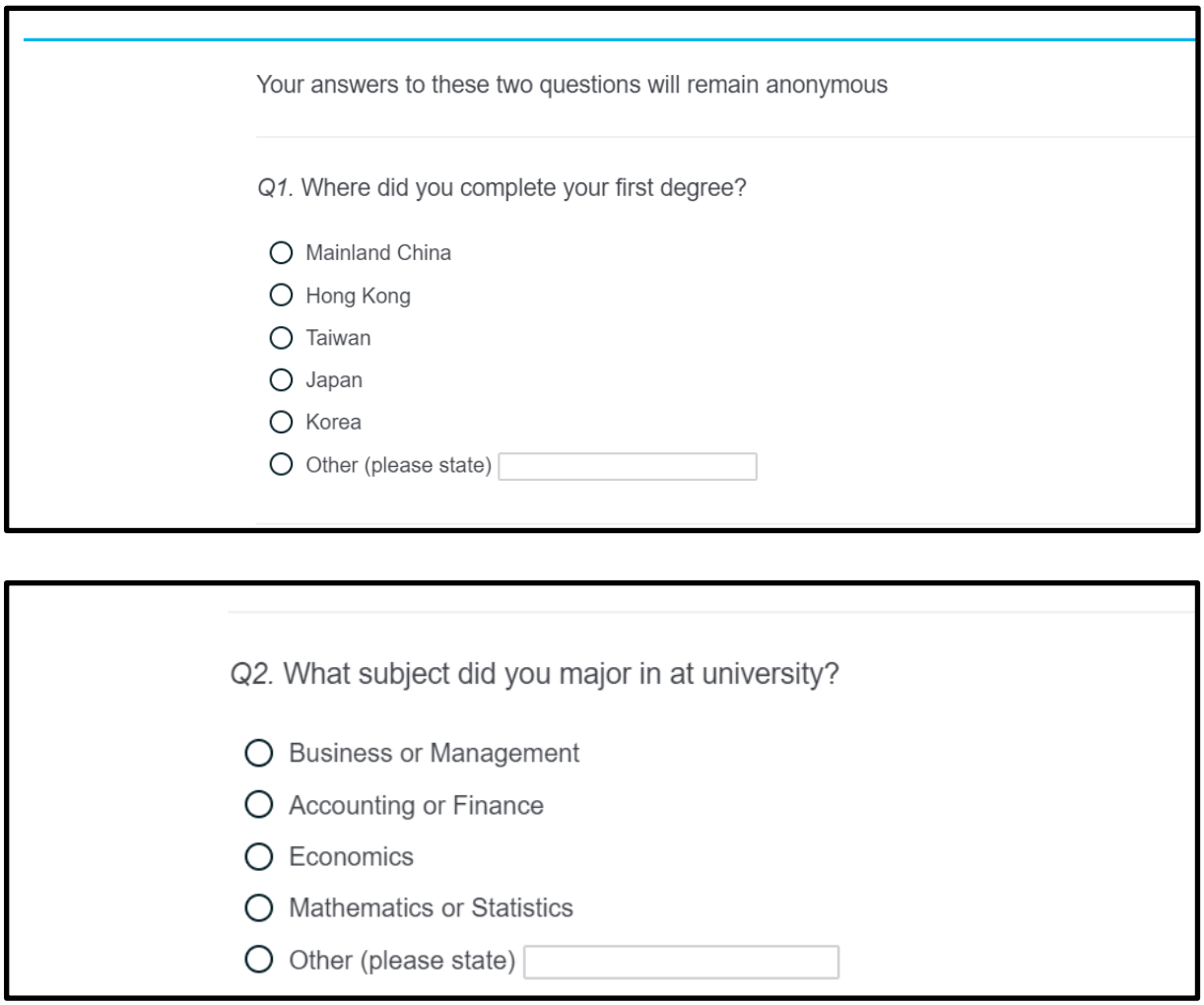
Appendix 20: Example Extracts of Annotated Transcripts from Cycle 2 Focus Groups



EXTRACT 2

Interviewer:	Conflict? Any words to do with business?	**Commented [2]:** Pushing to place in a business context - image does not seem to naturally fit this
Participant 1:	Competition.	**Commented [3]:** Identifies the intended target concept
Interviewer:	Competition. Correct – one point! What about this one?	
Participant 1:	It's risk, risk	**Commented [4]:** Very easily and quickly identified. Image appears familiar
Interviewer:	Risk	
Participant1:	Risky.	
Interviewer:	Yeah. Yeah. What about this one?	
Participant 3:	Training?	**Commented [5]:** Alternative target concept
Participant 2:	Training.	
Interviewer:	Training, yeah. Anything else? So it could be training, which is also trying to make the dog obedient. So to behave. To do as it is told ... what to do. And this is a harder one.	
Participant 1:	Welfare.	**Commented [6]:** Image is not easily recognised
Interviewer:	No – good guess though. Could be, could be...what is the doctor doing?	**Commented [7]:** Having to explain what the picture involves - features either not recognised or too subtle
Participant 1:	Check his pulse. Check his...	**Commented [8]:** Moving closer to intended target concept, but lots of explanation needed
Interviewer:	Can you think of another word for checking. In a business context? You've used it in your work, in your report.	**Commented [9]:** Again pushing to see if can make sense of the image in the context of business
Participant 1:	Evaluate.	**Commented [10]:** A completely plausible alternative target concept, but not the one intended
Interviewer:	Oh well you could call it evaluate, yes. That's another word for this. So I think you identified the competition, the risk, the discipline or the training, but monitor, there...monitoring. So you may have noticed I've used pictures like this sometimes when I've tried to introduce an abstract concept. How do you feel about that?	
Participant 1:	It's ... do you mean use the picture to show the concept?	**Commented [11]:** Understands the purpose of images being used
Interviewer:	Yeah	
Participant 1:	Yes, I think really, really wonderful.	**Commented [12]:** Enjoys the use of images
Interviewer:	Why?	
Participant 1:	I like to see the pictures than text.	**Commented [13]:** Preference for images over text
Interviewer:	Ah, so you prefer pictures than lots of writing.	**Commented [14]:** Clarification - preferred to text
Participant 1:	Yes.	
Interviewer:	Ok. And is there something.... why is it that it is better than writing?	
Participant 3	Not too long...visual, visual.	**Commented [15]:** Conciseness of images valued

Appendix 21: Phase 2 Profiling Questionnaire



Your answers to these two questions will remain anonymous

Q1. Where did you complete your first degree?

- ○ Mainland China
- ○ Hong Kong
- ○ Taiwan
- ○ Japan
- ○ Korea
- ○ Other (please state)

Q2. What subject did you major in at university?

- ○ Business or Management
- ○ Accounting or Finance
- ○ Economics
- ○ Mathematics or Statistics
- ○ Other (please state)

Appendix 22: Participant Information Sheet for Phase 2

University of Huddersfield

School of Education and Professional Development

Participant Information Sheet

Invitation to participate

You are being invited to take part in my Doctor of Education research. Before you decide whether or not you wish to participate, it is important for you to understand why this research is being conducted and what it will involve. Please take time to read the following information and discuss it with others if you wish. If there is anything that is not clear or if you would like more information, let me know.

The purpose of the research

The purpose of my research is to explore the use of visual metaphors as a way of communicating the meaning of abstract concepts in the context of lectures. It is an action research project that involves working with international Management students. The research contributes towards my Doctorate in Education at the University of Huddersfield.

Why am I asking you to participate?

My research is focused on the teaching of international students. I want to make sure that you have the best possible learning experience. I want to understand more about how you learn, and I want to use my research findings to inform my practice. I am interested in your thoughts on how I use visual metaphors in my lectures. I am also interested in the ways in which you might interpret visual metaphors and how you might select and use visual metaphors to help explain concepts.

Do I have to take part?

Participation in this study is entirely voluntary, so please do not feel obliged to take part. Refusal will involve no penalty whatsoever and you may withdraw from the study at any stage without providing me with an explanation. You may withdraw any data you have contributed by notifying me within one month of the final course lesson.

What do I have to do?

In Week 2 I will ask you to participate in a profiling survey. The survey will collect data relating to your nationality, where you completed your undergraduate course, and the

subject you studied. In Week 8 I will be conducting a group interview. This should take no more than 30 minutes of your time and will be recorded. I will also be using visual metaphors in activities that you will be completing in the seminars. I would like to use the output from these activities as data for my research and may ask you questions about the choices you have made. Before any of this research takes place, I will ask you (in writing) to confirm that you agree to participate.

Are there any disadvantages to taking part?

I foresee no disadvantages to your participation. If you are unhappy or have further questions at any stage in the process, please address your concerns initially to me if this is appropriate. Alternatively, please contact my research supervisor Dr David Powell at the School of Education & Professional Development, University of Huddersfield (d.powell@hud.ac.uk).

Will all my details remain confidential?

All information which is collected will be strictly confidential and anonymised before the data is presented, in compliance with the Data Protection Act and the ethical research guidelines and principles of The British Educational Research Associate (BERA), The University of Huddersfield and [redacted].

What will happen to the results of the research study?

The results of this research will be presented in my doctoral thesis. If you would like a copy please let me know. I may also present my research findings and conclusions in publications and at conferences.

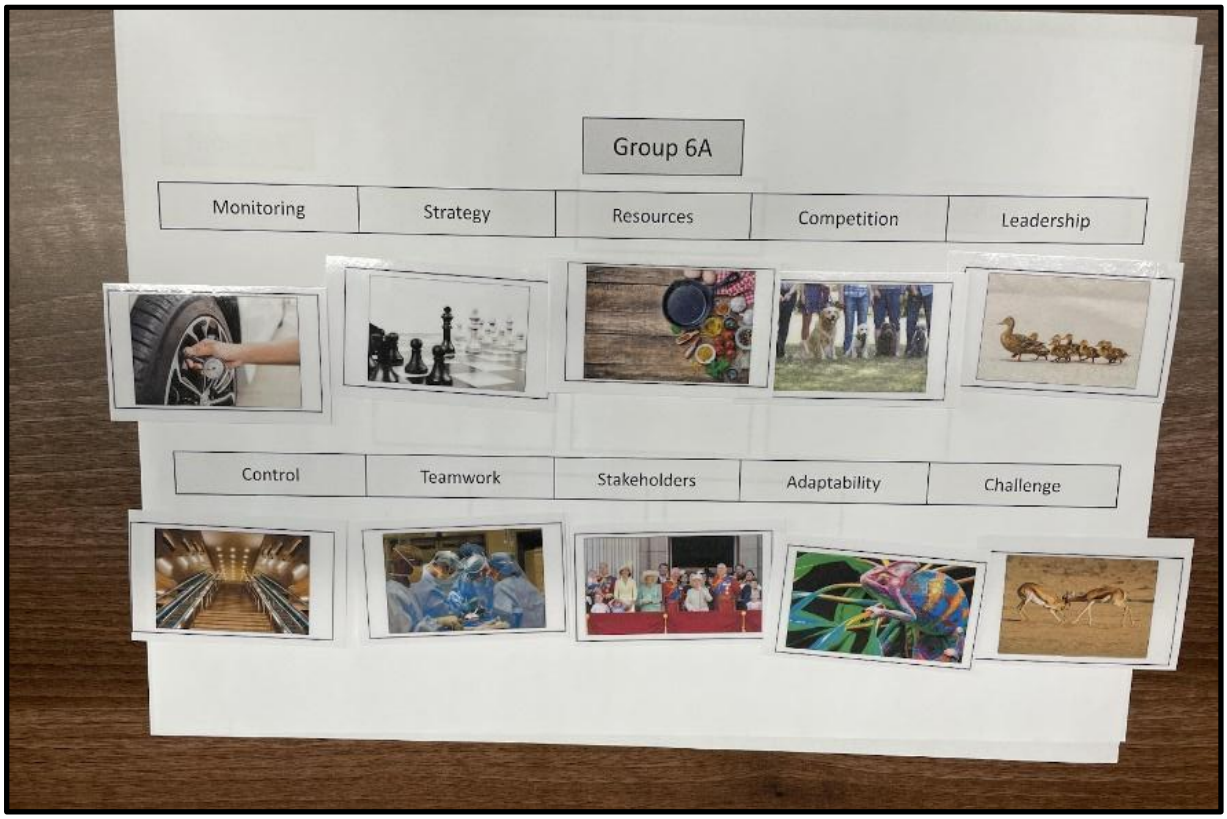
Name & Contact Details of Researcher:

Richard Cotterill
Lecturer
Business and Management
[redacted]

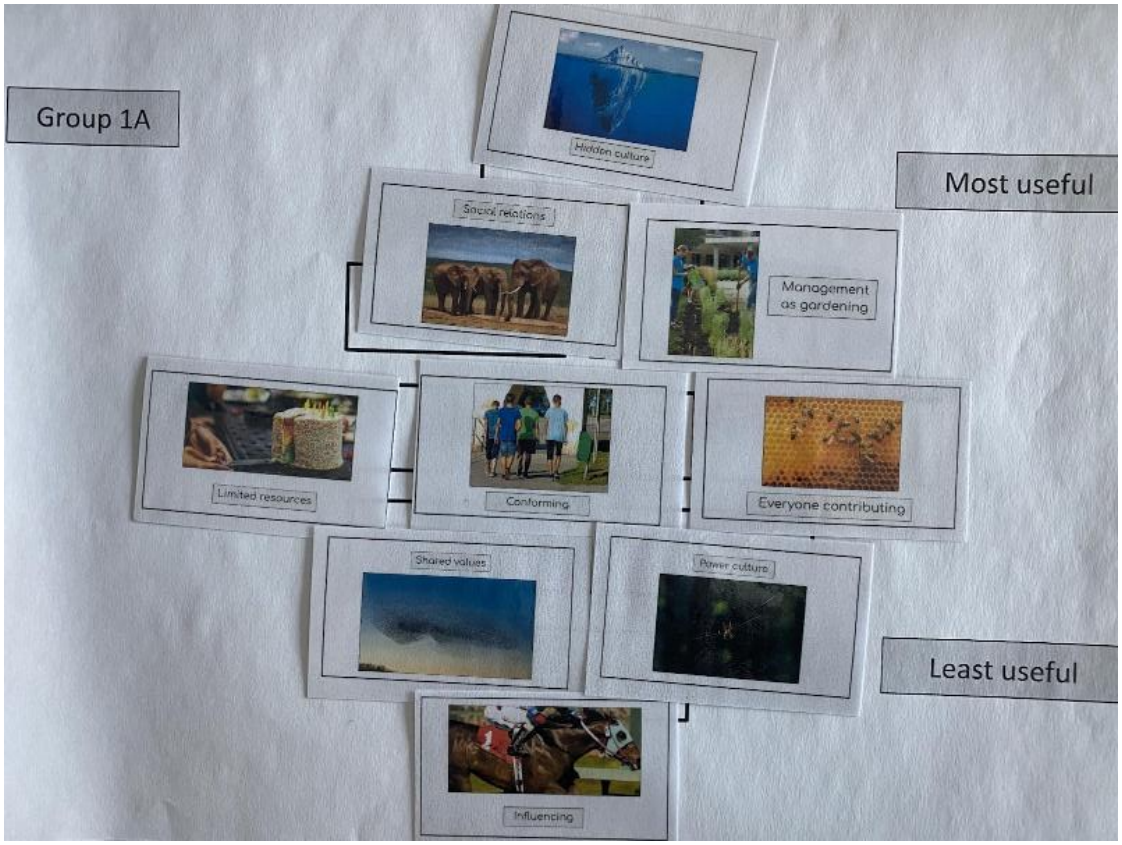
Appendix 23: Completed Continuum of Difficulty Task



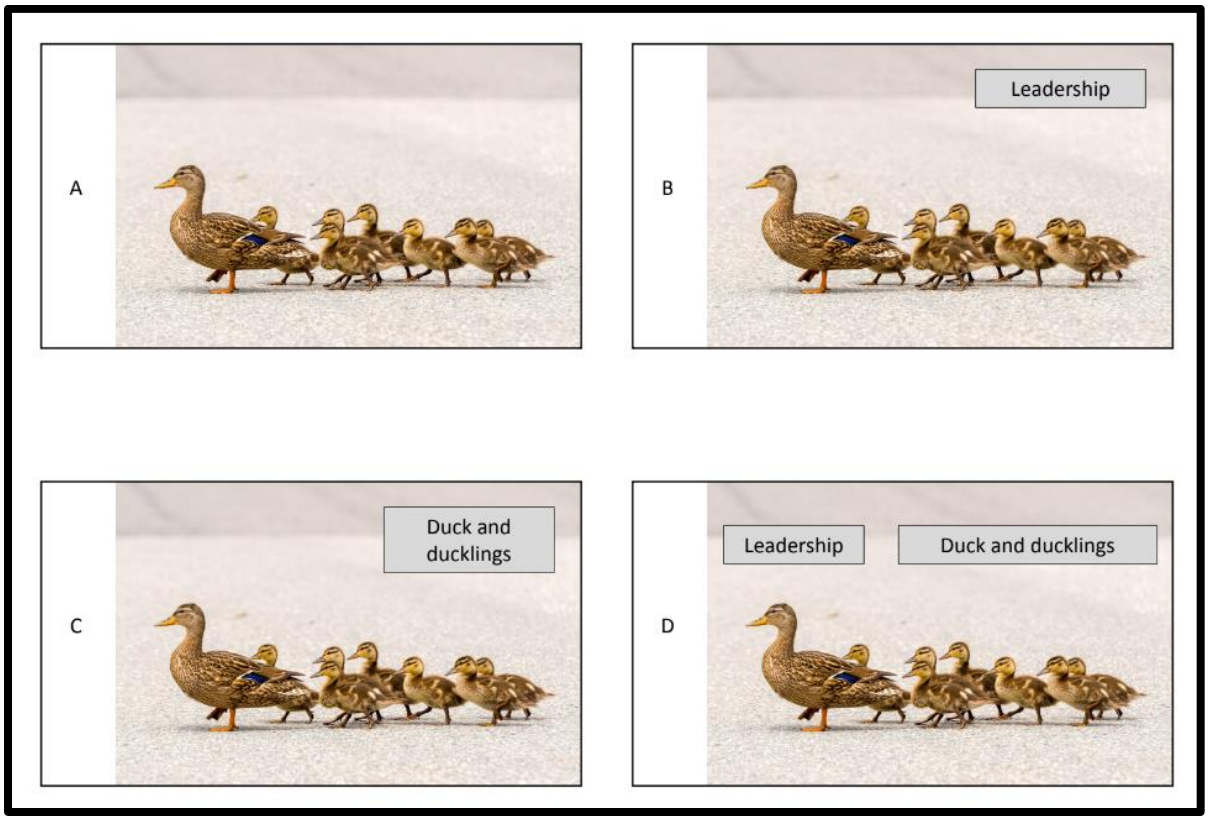
Appendix 24: Example of Completed Matching Task



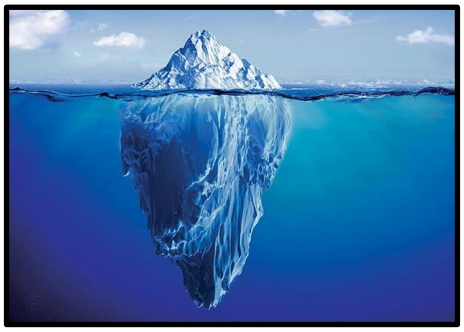
Appendix 25: Example of Completed Diamond Nine Task



Appendix 26: Four Versions of Lecture Slide



Appendix 27: Follow-up Questions (Cycle 3)



1. Most groups I interviewed asserted that this image of an iceberg was very clear and helped them to understand the way in which culture might be hidden.

Why is this image so helpful?



2. Most groups I interviewed asserted that this image of a horse and rider was very unclear and did not help them to understand the concept of influencing.

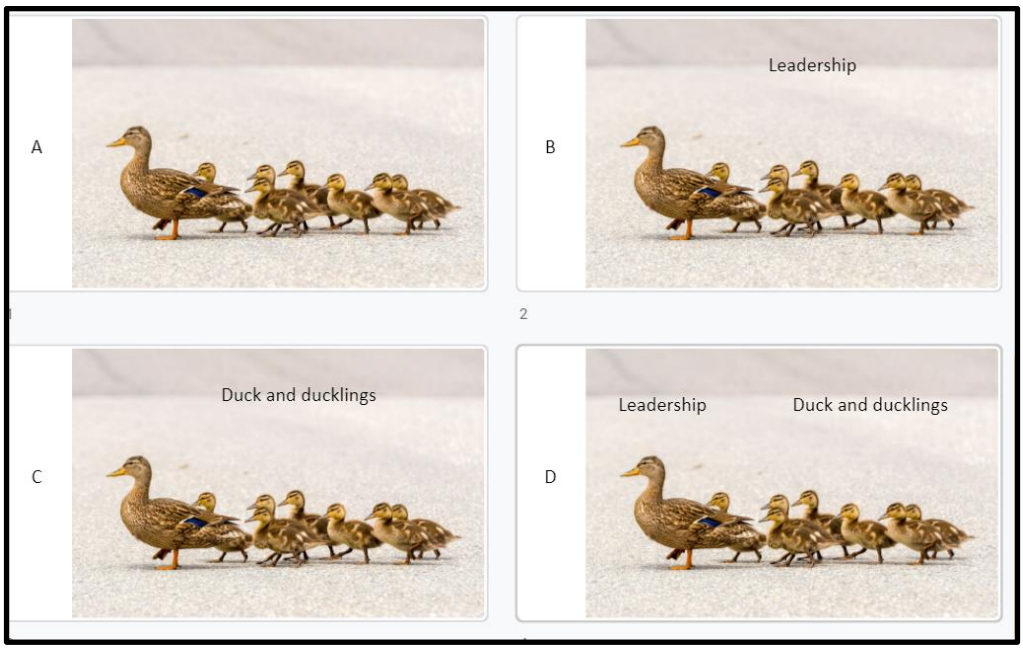
Why is this image so unhelpful?

3. Some visual metaphors seem to be very **helpful** to understanding.

What do you consider to be the **features** of a **helpful** visual metaphor? Please be as specific as possible.

4. Some visual metaphors seem to be very **unhelpful** to understanding.

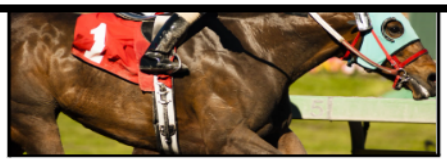
What do you consider to be the **features** of an **unhelpful** visual metaphor? Please be as specific as possible.



5. Look closely at the four different versions of this lecture slide (A, B, C and D).

Which version do you think is most helpful? Explain why

Appendix 28: Screenshots to Show Examples of Answers to Follow-Up Questions



2. Most groups I interviewed asserted that this image of a horse and rider was very unclear, and did not help them to understand the concept of influencing.

Why is this image so unhelpful? Might be due to the lack of strong associative connections between the term influence and the jockey depicted in the picture. I would personally say that

1

the word "control" aligns better with the picture

3. Some visual metaphors seem to be very **helpful** to understanding.

What do you consider to be the **features** of a **helpful** visual metaphor? Please be as specific as possible. The high associative or personal connection between the picture and the noun is the only one and the best feature of vm.

3. Some visual metaphors seem to be very **helpful** to understanding.

What do you consider to be the **features** of a **helpful** visual metaphor? Please be as specific as possible.

Fewer and prominent elements. For example, the sun, if the background is the universe, it is easier to be understood by people, rather than the sun in the sky, it is easy to be understood as a sunny day or sky.

Based on words or phrases, extract a keyword that most people immediately think of in their definitions. For example, bullying,most people may think of the weak being beaten unilaterally, without resistance, and using pictures to lead people to the most critical definition.

4. Some visual metaphors seem to be very **unhelpful** to understanding.

What do you consider to be the **features** of an **unhelpful** visual metaphor? Please be as specific as possible.

Too many elements in the image. For example, you want to use a picture to explain what a cloud is, so please highlight it, do not choose a picture that contains an aeroplane, the sun, a balloon, or a bird in the sky.

Misunderstood or contains content that can be explained by other words or

Appendix 29: Phased narrowing - Stage 1

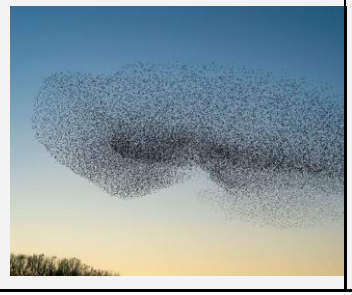
Finding better images

The 10 images below were used in lectures. However, many students have told me that these images were not effective at helping them to understand the concepts I was explaining. Please can you find a better image? Try to find at least six, but do them all if you can! It would also be useful if you could provide a brief explanation of **why** your image would be better.

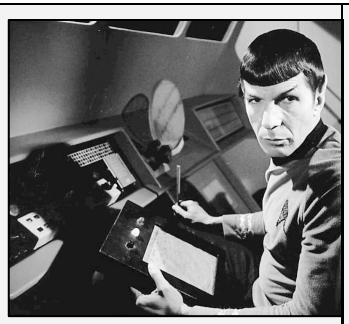
Thanks

Rich

Image number	Original image	Reasons why not effective	Your chosen image	Why is it more effective?
1 Used to show that this course is **challenging**, not **easy**		Not clear that a challenge is involved Alternative choice of escalator not clearly visible Image could mean process or strategy		
2 Used to show **influencing**		Not clear who is influencing who Not familiar with horses Horse seems more powerful than the rider		

3 Used to show **monitoring**		May show car being repaired Not familiar with cars Not clear what is happening in the picture		
4 Used to show a **diverse stakeholder group**		Royal family are associated with power Not clear that there is any diversity between these people		
5 Used to show **cultural conformity**		Not familiar with the image Unclear what the birds are doing		

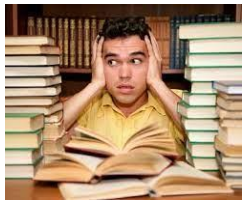
6 Used to show **power culture**		Spider does not appear very powerful Nothing else for the spider to have power over		
7 Used to show **sub-culture**		Penguin is alone, not in a sub-group Could show one penguin being bullied Could show one penguin walking faster than the others		
8 Used to show **subordinates may be useful**		Not clear who is the subordinate one Not clear who is useful to who		

9 Image used to show **rationality**		Could show control Could show leadership Character is not familiar		
10 Image used to show **control**		Could show teamwork Could show defending or protecting Could show leadership Nothing that needs controlling in the image		

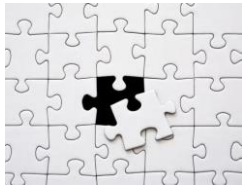
Appendix 30: Phased Narrowing - Stage 2

Finding better images: Part 2

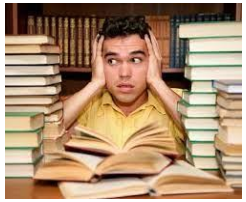
As a group, for each concept choose your **three** favourite images. Rank these three in order of preference from 1 to 3 (1 for your most preferred to 3 for your least preferred of the three).

Challenge						
[redacted]						
Influencing						
[redacted]						

Monitoring						
Diverse stakeholders						
Power culture						

Subculture						
Rationality						
Control						

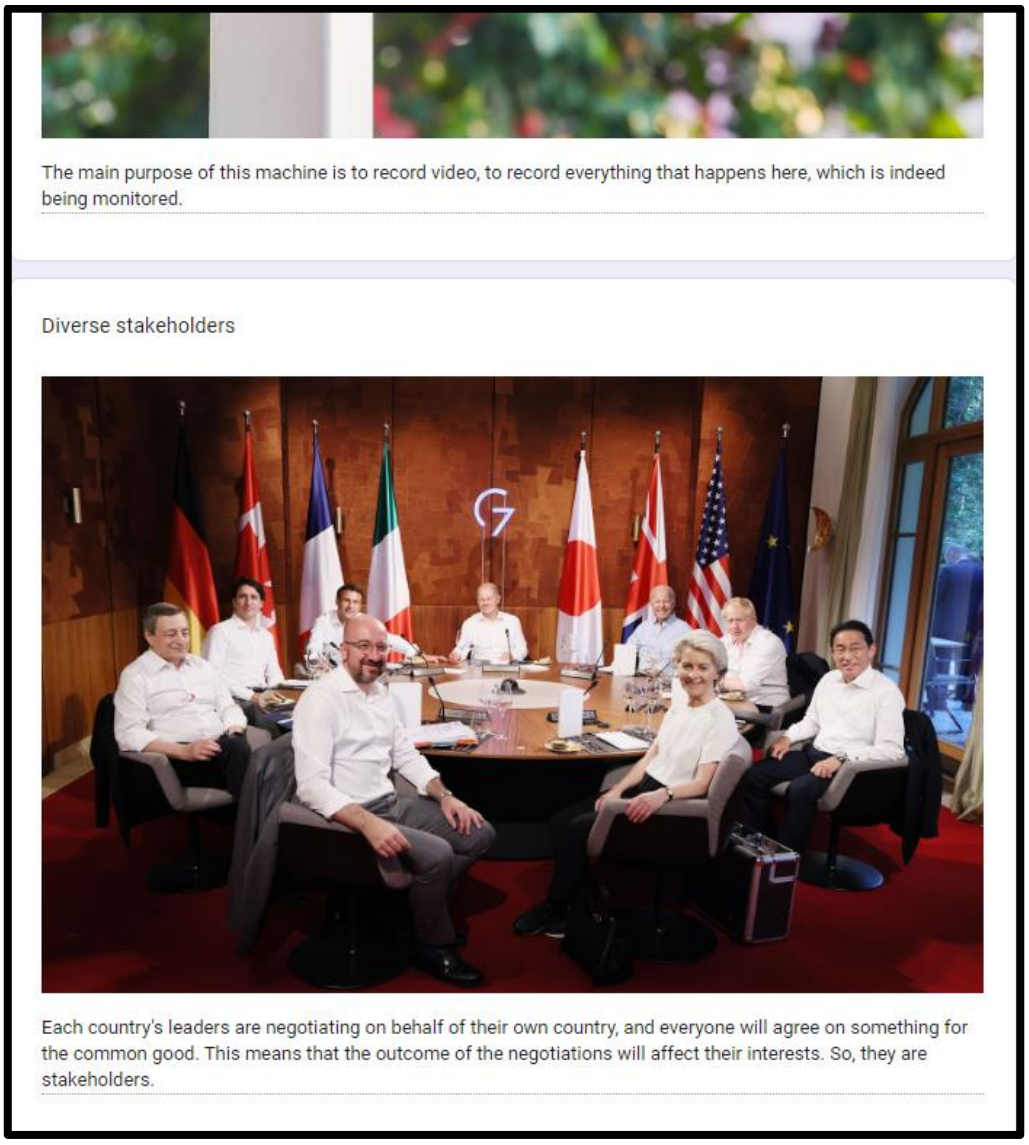
Appendix 31: Phased Narrowing - Results

Challenge						
	5	2	3	10	20	**32**
Influencing						
	9	4	16	16	4	**23**
Monitoring						
	30	25	3	9	5	0

Diverse stakeholders						
	16	5	**33**	1	14	3
Power culture						
	17	9	**22**	18	3	3
Sub-culture						
	8	**21**	17	7	14	5

Rationality						
	0	12	7	12	**21**	20
Control						
	5	**28**	11	21	6	1

Appendix 32: Screenshots to Show Examples of Comments on Phased Narrowing Selection



The main purpose of this machine is to record video, to record everything that happens here, which is indeed being monitored.

Diverse stakeholders

Each country's leaders are negotiating on behalf of their own country, and everyone will agree on something for the common good. This means that the outcome of the negotiations will affect their interests. So, they are stakeholders.



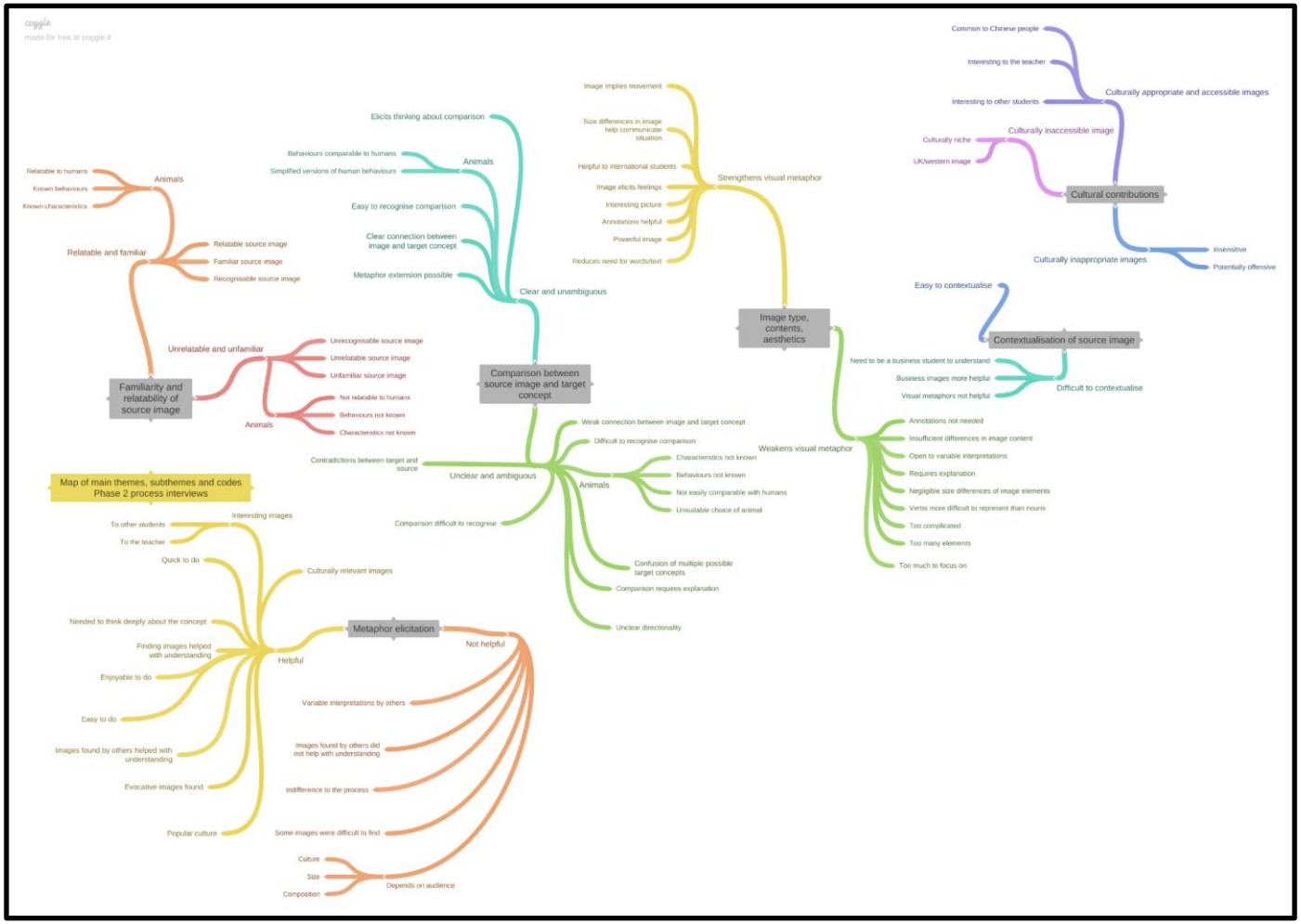
A robot's mind is designed through computer programming and does not have any self-initiated emotions, so it is completely rational.

Control



Marionettes are puppets whose hands and feet are completely tied, which means that every step they take and every movement they make is manipulated by the other end of the string. Their eyes are closed, and they don't need to think or know what to do next.

Appendix 33: Map of TA Codes from Phase 2



Appendix 34: Main Themes and Subthemes from Phase 2

Main theme	Helpful factor subtheme	Unhelpful factor subtheme
Familiarity and relatability of source image	Familiar and relatable	Unfamiliar and unrelatable
Comparison between source image and target concept	Clear and unambiguous	Unclear and ambiguous
Source image type, contents and aesthetics	Strengthens visual metaphor	Weakens visual metaphor
Contextualisation of source image	Easy to contextualise	Difficult to contextualise

Cultural contributions	Accessible or appropriate	Inaccessible or inappropriate

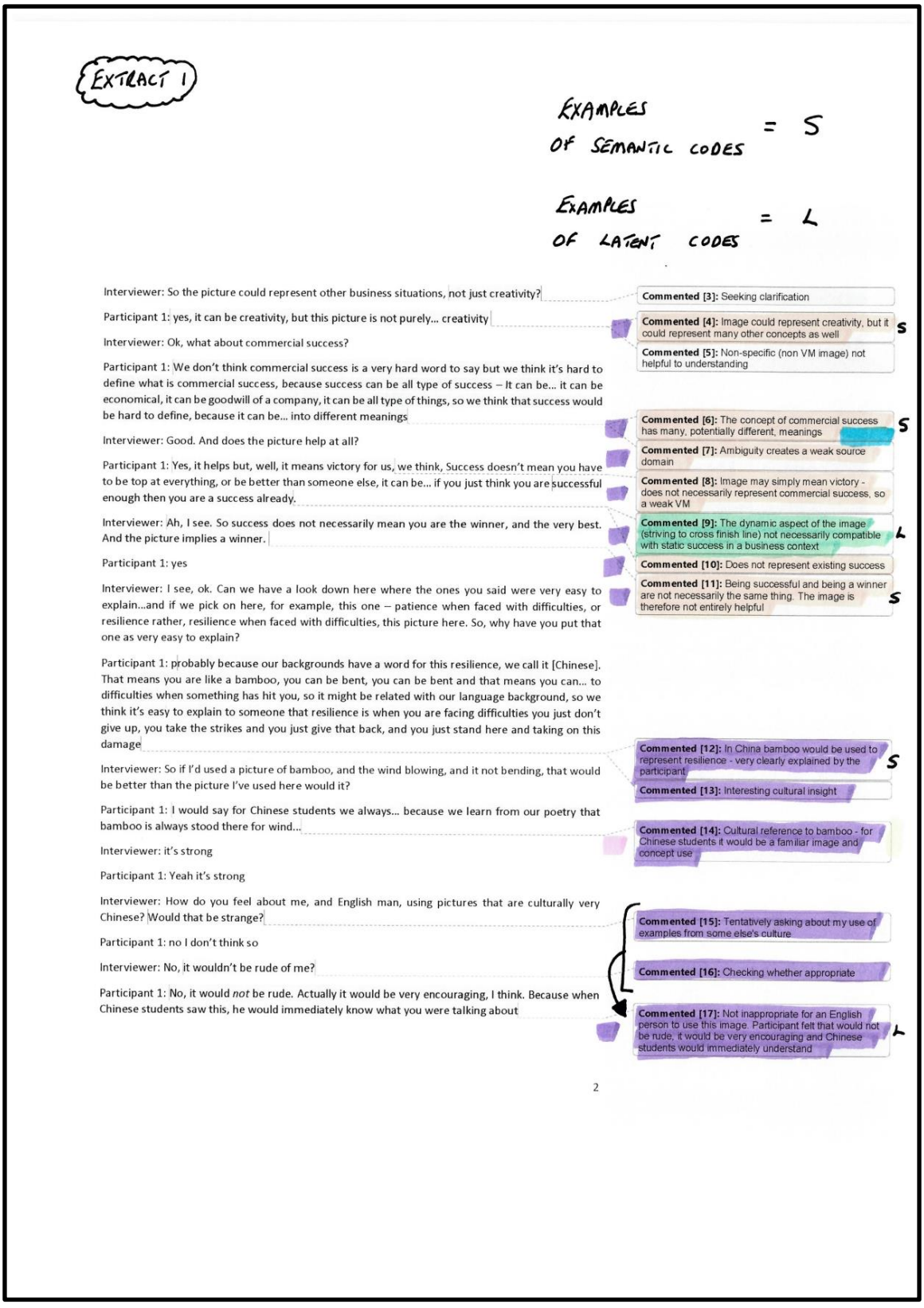
Metaphor elicitation	Helpful	Unhelpful

Appendix 35: Main Themes and Subthemes and Codes from Interview Transcripts (and answers to follow-up questions in Cycle 3) - Locations of Key Data Items and Potential Quotations

Main themes	Subthemes	Key locations of codes in transcripts
Familiarity and relatability of source image	Familiar and relatable	(3-1A-1); (3-1A-6); (3-1A-10); (3-1A-13); (3-2A-9); (3-2A-11); (3-3A-6); (3-4A-1); (3-4A-4); (3-5A-8); (3-6A-2); (3-6A-4); (3-6A-6); (3-6A-8); (3-1B-4); (3-2B-3); Q4; Q6; Q11; Q13; Q14; Q17; (4-1A-3); (4-1A-11); (4-1A-12); (4-1B-2); (4-1B-5); (4-1B-10); (4-1C-6); (4-1C-8); (4-1C-9); (4-1D-8); (4-1D-9); (4-1D-11); (4-1D-12); (4-1D-15); (4-2A-7); (4-2B-2); (4-2B-11); (4-2C-9); (4-3A-2); (4-3A-5); (4-3A-7); (4-3C-4); (4-3E-4);
	Unfamiliar and unrelatable	(3-1A-6); (3-1A-7); (3-2A-3); (3-2A-12); (3-3A-6); (3-4A-4); (3-5A-8); (3-6A-4); Q12; Q14; (4-1A-3); (4-1A-10); (4-1C-7); (4-1D-12); (4-1D-13); (4-2C-5);
Comparison between source image and target concept	Clear and unambiguous	(3-1A-2); (3-1A-10); (3-1A-13); (3-2A-3); (3-2A-5); (3-2A-8); (3-2A-12); (3-2A-14); (3-3A-1); (3-4A-1); (3-4A-2); (3-4A-3); (3-5A-4); (3-5A-6); (3-5A-8); (3-5A-10); (3-5A-12); (3-6A-4); (3-6A-8); (3-1B-3); (3-1B-4); (3-1B-5); (3-2B-3); (3-2B-4); Q1; Q2; Q3; Q4; Q5; Q7; Q8; (4-1A-2); (4-1A-4); (4-1A-6); (4-1A-8); (4-1A-11); (4-1B-2); (4-1B-3); (4-1B-6); (4-1B-7); (4-1B-8); (4-1B-9); (4-1B-10); (4-1B-12); (4-1C-2); (4-1C-3); (4-1C-5); (4-1C-6); (4-1D-2); (4-1D-7); (4-1D-11); (4-1D-12); (4-1D-15); (4-2A-2); (4-2A-4); (4-2C-3); (4-2C-5); (4-2C-8); (4-3A-2); (4-3A-3; (4-3A-4); (4-3A-8); (4-3B-2); (4-3B-3); (4-3B-5); (4-3C-2); (4-3C-3); (4-3C-4); (4-3D-4); (4-3E-2); (4-3E-5);
	Unclear and ambiguous	(3-1A-3); (3-1A-6); (3-1A-7); (3-1A-8); (3-1A-9); (3-1A-13); (3-2A-3); (3-2A-6); (3-2A-8); (3-2A-10); (3-2A-12); (3-2A-13); (3-3A-4); (3-3A-6); (3-3A-6); (3-4A-1); (3-4A-2); (3-4A-3); (3-4A-5); (3-5A-8); (3-5A-10); (3-6A-1); (3-6A-3); (3-6A-4); (3-6A-6); (3-6A-7); (3-6A-10); (3-1B-1); (3-1B-2); (3-1B-5); (3-2B-1); (3-2B-2); (3-2B-5); Q2; Q3; Q4; Q6; Q13; Q15; Q17; (4-1A-4); (4-1A-5); (4-1A-13); (4-1A-14); (4-1B-1); (4-1B-3); (4-1B-4); (4-1B-7); (4-

		1B-8); (4-1B-9); (4-1C-2); (4-1C-7); (4-1C-8); (4-1C-10); (4-1D-3); (4-1D-4); (4-1D-5); (4-1D-6); (4-1D-9); (4-1D-10); (4-1D-10); (4-1D-13); (4-1D-14); (4-2A-4); (4-2A-8); (4-2B-2); (4-2B-3); (4-2B-4); (4-2B-7); (4-2B-12); (4-2B-13); (4-2C-4); (4-2C-4); (4-2C-8); (4-3A-1); (4-3A-5); (4-3A-7); (4-3A-8); (4-3B-1); (4-3B-4); (4-3C-1); (4-3D-2); (4-3D-4); (4-3E-1); (4-3E-2); (4-3E-4);
Source image type, contents and aesthetics	Strengthen visual metaphor	(3-1A-5); (3-1A-11); (3-2A-12); (3-3A-2); (3-3A-8); (3-4A-2); (3-4A-3); (3-4A-4); (3-4A-5); (3-4A-6); (3-5A-6); (3-5A-8); (3-5A-9); (3-6A-2); (3-6A-6); (3-6A-7); (3-6A-8); (3-1B-3); (3-1B-4); (3-1B-5); (3-1B-7); (3-2B-2); Q2; Q3; Q9; Q10: Q12; Q15; Q16; (4-1A-3); (4-1A-6); (4-1A-8); (4-1A-15); (4-1B-9); (4-1B-12); (4-1C-2); (4-1C-5); (4-1D-2); (4-1D-4); (4-1D-12); (4-2A-1); (4-2A-7); (4-2A-10); (4-2B-6); (4-2B-7); (4-2B-8); (4-2C-4); (4-2C-5); (4-3A-5); (4-3B-5); (4-3C-2); (4-3C-3); (4-3D-2); (4-3E-3); (4-3E-4);
	Weakens visual metaphor	(3-2A-9); (3-3A-2); (3-3A-5); (3-3A-6); (3-4A-3); (3-4A-4); (3-5A-12); (3-6A-3); (3-6A-6); (3-6A-7); (3-6A-9); (3-2B-5); Q3; Q5; Q10; Q14; Q15; Q16; (4-1C-3); (4-1C-9); (4-1D-5); (4-1D-14); (4-2C-4); (4-2C-6); (4-3A-2); (4-3B-1);
Contextualisation of source image	Easy to contextualise	(3-2A-13); (3-1B-6); (4-3C-2);
	Difficult to contextualise	(3-1A-1): (3-1A-3); (3-1A-14); (3-6A-1); (4-3A-3); (4-3E-1);
Cultural contributions	Accessible or appropriate	(3-2A-15); (3-2A-16); (3-6A-11); (3-1B-2); (3-2B-2); Q7; (4-1A-7); (4-2B-16); (4-2C-11); (4-2C-13); (4-3A-3); (4-3B-6); (4-3C-6); (4-3E-3);
	Inaccessible or inappropriate	(3-1A-7); (3-1A-16); (3-2A-5); (3-2A-9); (3-2A-15); (3-2A-18); (3-3A-3); (3-3A-4); (3-4A-1); (3-4A-2); (3-5A-6); (3-6A-7); (3-1B-2); (3-2B-5); Q17; (4-1A-7); (4-1B-8); (4-1D-10); (4-1D-15); (4-1D-21); (4-1D-22); (4-2A-4); (4-2A-11); (4-2B-6); (4-3B-3);

Appendix 36: Example Extracts of Annotated Transcripts from Phase 2 Process Interviews



EXTRACT 2

Interviewer: Competing. Yeah, so it's nice and clear and obvious what they're doing there. Are there any that were not so useful? Any that you think were more difficult to match?

Participant 1: Challenge and control...we had a little argue over them.

Interviewer: Ok, so what was the problem with those pictures?

Participant 1: for challenge we think, at the beginning we put the elevator and this escalator or el.. escalator and the stairs we put into the strategy...because we said that was two ways to reach the top.

Interviewer: Ah, I see

Participant 1: Well this can be a metaphor, right? Can to metaphor into different meanings, for stairs, so we kind of struggled with this picture. And control, some of us might said animals and people are not control, they were a bit like coupling or something like this but we are not fully control the animal.

Interviewer: Ah, so with the challenge picture there are different ways of interpreting that. It could be strategy, you might choose to walk, or use - we'd call it an escalator, an escalator, and with the animals, with the dogs, they're not necessarily being controlled, it's... is there something more about control that's missing there, do you think?

Participant 1: Yes

Interviewer: Right, ok. Ok. So are there any particular types of image, you think, are there any types of image that you think were easiest, without choosing any in particular? Is there anything about animals, or anything about people, or situations, is there anything that you can say?

Participant 1: We think animals would be very...would be easier for us to understand because I think we once did a metaphor on, like, homework. You asked us to give... you give us some business term and you want the... you want us to find some animal's picture for this term. I found this quite interesting, and I see all the other guys working, they're doing very good job at understand something.

Interviewer: That's good, that's good, at the end we'll have a quick look at some examples that you found. So why are animals so useful do you think, then, why are they so appropriate for representing meaning?

Participant 1: Well if you just put a man or people on a picture it feels like it's too direct, you just don't think, you just see the image and, you know, ok this is just a bunch of businessmen doing their job, communicating, but if you, if you put a the ducklings and the mother duck and the picture like this one, you might think, oh that's interesting, and you would... you actually would look even more detailed somehow this picture, because we... probably it's the... the enthusiasm of people - we love animals, do we pay more attention to the picture.

Interviewer: Ah, so we like animals, and it makes us think a bit more about what we can see there and what it means.

Participant 1: yes

Interviewer: ok. Ok, I've got one more task for you to do, one more task and then after that I've just got a couple of quite quick questions to ask you. So I'll just share this last one with you. Now I do have a little gift for everybody who's participated, but because you're not in the UK I'll have to give it you when you come here [laugh]. Ok, right, so one last job to do, you can just open what's in the chat box there. And you might remember that in some of the lessons we've used these, they're called diamond nines, and it's quite a simple way to try to get students to prioritise items - that might be pictures of

Commented [25]: Pushing to discuss weaker examples

Commented [26]: Implies disagreement in discussion

Commented [27]: Image of escalator and stairs could be confused with strategy as implies striving to reach the top and that there are choices in terms of how to do this - weak VM

L

Commented [28]: Participant (unprompted) uses the word metaphor. Animal picture unclear - not clear that the dogs are being controlled, which forms a relatively weak VM

L

Commented [29]: Enjoy and find meaning in the animal metaphors

L

Commented [30]: Animal metaphors have real meaning. When finding images, finding animal-related ones were interesting

S

Commented [31]: Animal images are less (obvious) direct than images of people. It adds interest and makes the observer look more closely at the contents of the picture. Animal pictures generate enthusiasm - people like to look at animals

S

Commented [32]: Clarifying that my interpretation is correct

EXTRACT 3

Participant 3: So the people, it didn't...it can't see.

Interviewer: Blind?

Participant 3: Yes... the people just chose this dog. The dog is...

Interviewer: So we would say that was a guide dog.

Participant 3: Yeah, yeah guide dog, guide dog.

Interviewer: OK so why is that difficult to explain?

Participant 1: Because we can't get the information about the people from the picture. We can't see she or he is blind, so we don't know it's a guide dog.

Interviewer: So what is the problem with the picture?

Participant 2: Because I don't think...the guide dog is maybe not similar to the authority.

Interviewer: Ah, so the guide dog doesn't have authority. Right.

Participant 2: Yeah.

Interviewer: So that makes the picture confusing.

Participant 2: Yeah

Interviewer: OK, OK, what about this one? Dominance of subordinate workers. Is there a problem there?

Participant 3: The picture is difficult to...

Participant 1: We can't watch the level of the people, yeah

Participant 3: Not clearly.

Participant 1: We can't see the staff who is the high level and the low level.

Interviewer: Ah, so the picture doesn't tell you...

Participant 1: Yeah, about...doesn't tell us about the...

Participant 2: who is the high level, who is the low level.

Interviewer: Ah, so it doesn't show you who is above or below.

Participant 2: Yeah

Interviewer: Because everybody is the same in this picture.

Participant 2: Yeah

Interviewer: OK. Anything else you want to say about these pictures?

Commented [12]: Confirming participant understands the image

Commented [13]: Further confirmation

Commented [14]: This participant clear that the dog is a guide dog S

Commented [15]: Not clear from the picture what the situation is e.g. not clear that the person is blind. The information about the characteristics of the person in the picture are not clear enough S

Commented [16]: Even though clear that dog is guide dog, not assuming that person is blind. Implies wants source domain to be very easy to interpret S

Commented [17]: Other two participants do not understand what is happening in the picture

Commented [18]: Guide dog does not (necessarily) have authority so the concept is not explained through the image L

Commented [19]: Clarifying that my interpretation is correct

Commented [20]: Image lacks a key feature - levels in hierarchy L

Commented [21]: The image does not help to show differences in levels of authority L

Commented [22]: Hierarchy cannot be found in the source image making the VL ambiguous and weak L

Commented [23]: Not clear who has authority and who is the subordinate - clarifying my interpretation S

Commented [24]: Levels seem to be the same in the picture so hierarchy not apparent S



Participant 1: How about this?

Participant 2: Resources?

Participant 1: Yeah...ah yeah resources, yes. Yeah, there's a lot of... This is about strategy.

Participant 2: Yeah, that's the strategy.

Participant 1: That is not clear

Participant 2: Not clear... Competition

Participant 1: Ok so this is stakeholders

Participant 2: Competition, monitoring, stakeholders...

Participant 1: Stakeholders

Interviewer: Ok, finished?

Participant 2: Picture?

Interviewer: Yes please, picture, that would be good. Ok, I'll let you take a picture for me and then I'll...So that's nearly all exactly like in the lecture, almost.

Participant 1: So there's a mistake...

Interviewer: Well, it's not a mistake because it's, you're interpreting this, so it's not a mistake but I did use this the other way round. In the lecture that was stakeholders, that was control, because the dogs were under control. So that... Was there a reason why these were confusing? Or weren't...

Participant 2: They were mostly similar.

Interviewer: Too similar?

Participant 2: Yeah, in terms of...

Participant 1: Because, for me, I don't like to use control for the pet, because for me this word is kind of strong. Control.

Interviewer: So it's a power word and that doesn't look like...

Participant 1: So for this one in terms of the government, it's more control

Interviewer: Oh I see. So when you see a picture of the royal family you think of authority, power and that may be associated with control.

Participant 1: yes

Participant 2: It's like context-wise both these pictures are like, could be either control or stakeholders or stakeholders or control.

Participant 1: That's still..... I will.....is this done, this?

Participant 2: Yeah I would use that as well. For me its because, like, I don't recognise that to be somehow the representation of stakeholders at all

Interviewer: Ok. I think maybe that's because when I used that picture, I was talking about how there is a variety of stakeholders. But maybe that's me making an assumption here about you realising that

Commented [19]: Participants are assuming that there is a right answer to the task. Seeking firm and unequivocal connection between target and source domains

Commented [20]: VM that were too similar - makes interpretation difficult. Distinction between target and source domains and range of VM important

Commented [21]: Unsuitable VM - concept of strong is more powerful that interactions with a pet

Commented [22]: Alternative interpretation of VM. Implies control rather than related to stakeholders

Commented [23]: Ambiguous VM - clarification that image of royal family not suitable to represent stakeholders as associated with e.g. power and authority

Commented [24]: Reflects cultural difference. Royal family may be regarded by those from other cultures as symbolic of power and authority

Commented [25]: More powerful interpretation overrides the intended purpose of the VM

Commented [26]: Given the (lack of context) there is no reason why the images could not be used interchangeably

Commented [27]: Cannot see value or usefulness of this VM at all

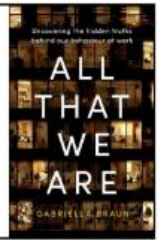
Commented [28]: Seeking clarification

9

Appendix 37: Presentation Slides Used at the CARN 2022 Conference



'In 2020, the Covid-19 pandemic plunged us into a depth of crisis most of us have never experienced. It turned our lives upside down… Our anxiety levels have rocketed' (Braun, 2022, p.5)



Conceptual metaphor theory
(Lakoff & Johnson, 1980)

Source domain → Target domain

Familiar or concrete → Unfamiliar or abstract

An example: applying conceptual metaphor theory

Source domain → Target domain

Robots



Rationality

Metaphors are powerful

Use is ubiquitous in everyday conversation and in literature (Kövecses, 2002)

Used extensively in Chinese literature (Ma & Gao, 2017)

Help with communication and understanding





What I wanted to know

Can visual metaphors be used as a way of unlocking the meaning of abstract concepts in lectures?

If so, what is the most effective way to use them?



Pedagogical action research (Norton, 2009) → Over four cycles (Wyse et al., 2018)

A research problem

Explaining *how* we learn or *why* we learn is extremely difficult

Focus groups used in Cycles 1 and 2

Useful but superficial data generated



Metacognition

Thinking about thinking is extremely challenging (de Blume et al., 2017)

Articulating this thinking is demanding



Can be conceptually complex and requires sophisticated vocabulary

Language issues may compound these difficulties for international students

Principal data collection methods (cycles 3 and 4)

Metaphor extension activities (Semino, 2008) → Process interviews



Metaphor elicitation tasks (Coulter & Zaltman, 1994)

Also… profiling surveys and phased narrowing



Process interviews

Semi-structured group interviews

Participants complete a series of tasks as a group

Questioning follows each task

Process interviews: a metaphor



Build a wall



Show and describe the wall



Tell me how you built it and *why* you chose those methods

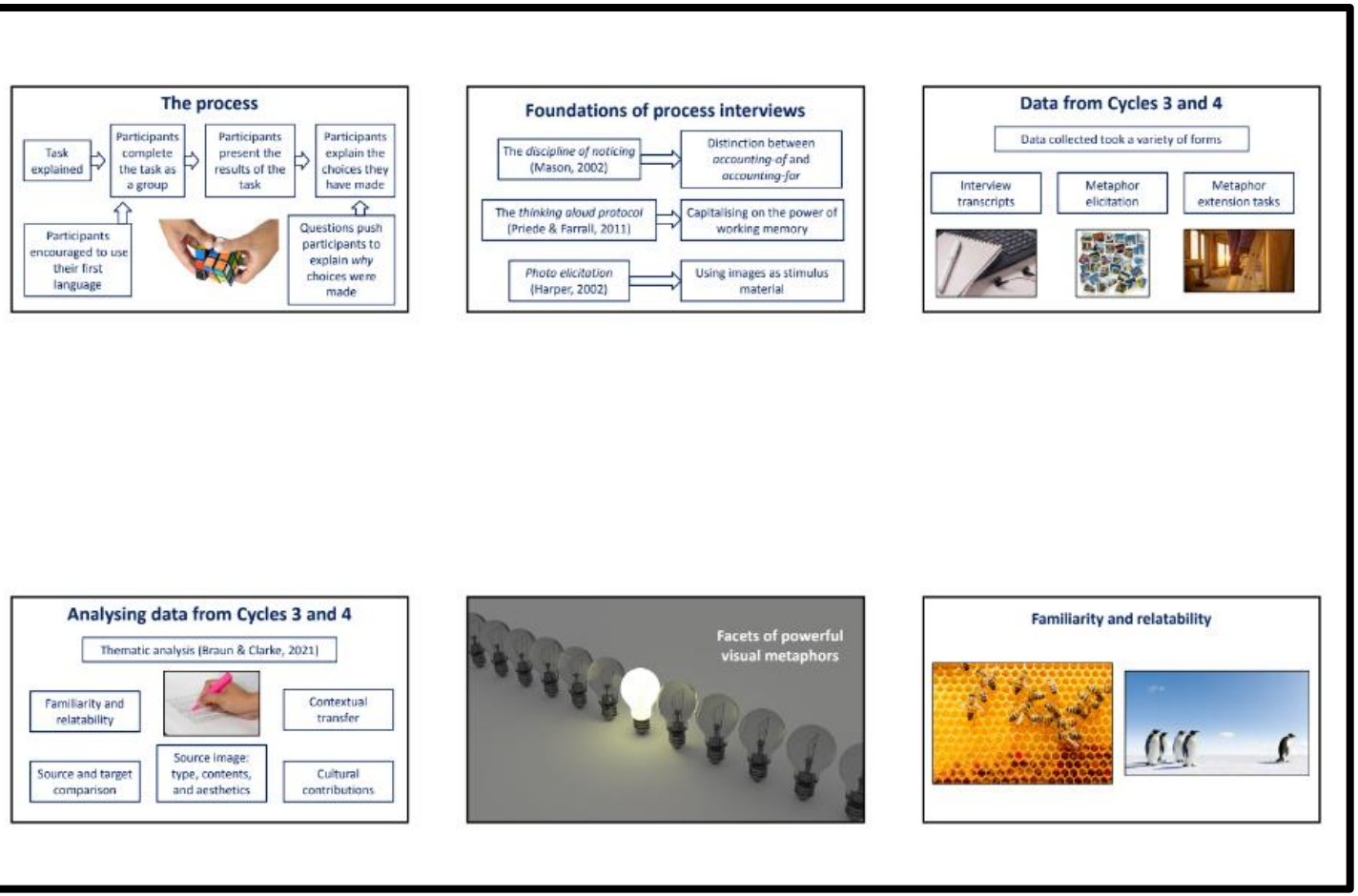
Group 3F



Most useful

Diamond nine template (Niemi et al., 2015)

Least useful


The process
Task explained
Participants complete the task as a group
Participants present the results of the task
Participants explain the choices they have made
Participants encouraged to use their first language
Questions push participants to explain why choices were made
Foundations of process interviews
The discipline of noticing (Mason, 2002)
Distinction between accounting-of and accounting-for
The thinking aloud protocol (Priede & Farrall, 2011)
Capitalising on the power of working memory
Photo elicitation (Harper, 2002)
Using images as stimulus material
Data from Cycles 3 and 4
Data collected took a variety of forms
Interview transcripts
Metaphor elicitation
Metaphor extension tasks
Analysing data from Cycles 3 and 4
Thematic analysis (Braun & Clarke, 2021)
Familiarity and relatability
Contextual transfer
Source and target comparison
Source image: type, contents, and aesthetics
Cultural contributions
Facets of powerful visual metaphors
Familiarity and relatability

Source and target comparison




Source image: type, contents, and aesthetics




Contextual transfer




Cultural contributions






Why so many animals?



We enjoy anthropomorphism (Epley et al., 2007)

Animals are useful as models of human behaviour

What next?

Investigate the impact of metaphor elicitation on learning



References

Any questions, comments, or feedback?



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