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Reimagining Digital Pedagogy in Higher Education Business Studies:
Applying a 3D Model to Three Case Studies

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School of Education

A dissertation submitted to the University of Bristol in accordance with the requirements for
award of the degree of Doctor of Education in the Faculty of Social Sciences and Law

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ABSTRACT

Written communication is no longer limited to text printed on sheets of paper. Written messages now arrive in a variety of modes on different digital devices and are read and produced multimodally. One of my key aims in this thesis was to explore the transformation of the knowledge transfer process by examining the digital pedagogies of three university educators and unpacking the extent to which multimodality and multiliteracies informed their digital pedagogies.

I used an interpretivist qualitative approach with a multi-case study design to explore how selected business teachers at the university level made their digital pedagogical decisions when working through multimodalities. A three-dimensional (3D) model provided a way to understand how the educators technically transformed traditional texts into various multimedia teaching materials, the cultural considerations involved in the pedagogical design process, and how the critical use of multimodalities addressed both institutional demands and students' needs. This 3D model was supplemented with the two concepts of "figured worlds" and educator identity to describe the contexts of the educators' digital pedagogical decisions.

In this thesis, I present a new perspective, based on the 3D model, to explore digital pedagogies in higher education business studies and their relationships with multimodalities and figured worlds. I show how this new visual representation of the 3D model can be used as an actualisation tool to understand multiliteracies and digital pedagogical planning and design. The results suggest that the critical dimension offered by the 3D model is most important in understanding digital pedagogy in higher education business studies. All of the focal educators in the case studies shifted from a text-dominated pedagogy to a multimodal digital pedagogy. In this way, these educators moved away from the text-dominated era into a multimodal world. However, it is vital to consider temporal and spatial factors when planning digital pedagogies.

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Finally, I must express my very profound gratitude to my husband, Coleman, for providing me with unfailing support and encouragement throughout my years of study. He took full care of our three girls, which gave me the flexibility to study every weekend. There is not a single day when I do not thank God for giving me such a caring and supportive husband. My mom joked that Coleman deserves to take credit for half of my doctoral degree!

COVID-19 STATEMENT

I conducted this thesis study from 2020 to 2022, during the COVID-19 pandemic. My original goal was to explore how educators at a university business school worked through multimodalities and made their digital pedagogical decisions. As teaching modes before the pandemic were fully offline and delivered face to face, I was originally interested in exploring digital pedagogical decisions and applications designed mainly for adoption in face-to-face teaching.

Following the social-distancing restrictions during the pandemic, teaching shifted fully online. I decided that my thesis would focus on case studies of university educators' digital pedagogical decisions that had been developed before the pandemic. I did not expect to be distracted by the sudden change in delivery modes during the pandemic, because I assumed that it would be a short-term disruption.

During my studies, I took note of the possibility that online teaching modes could change my case studies of university educators' digital pedagogical decisions. I conducted follow-up interviews with university students and educators to better understand these possible changes, although the delivery modes were not the original focus of my thesis. As original teaching outputs, I collected teaching artefacts, such as PowerPoint slides and videos, which were not disrupted because they had been developed before the pandemic.

Luckily, my data collection was not curtailed by the sudden closure of the university library and other facilities, nor were my interviews with the educators in my research hindered. The sudden need to move teaching and learning online improved my access to the research materials because they were also made available online. All the educators in my case studies were already used to communicating through Zoom; therefore, I could easily make appointments to interview them virtually in Zoom meetings, which saved me from the need to commute to the interview locations. All of the educators agreed to share their teaching artefacts by email.

Ironically, my studies were not interrupted by the sudden onset of the COVID-19 pandemic because the entire process—from obtaining ethical clearance to collecting data and communicating with my supervisors—could be smoothly conducted fully online.

AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the requirements of the University's *Regulations and Code of Practice for Research Degree Programmes* and that it has not been submitted for any other academic award. Except where indicated by specific reference in the text, the work is the candidate's own work. Work done in collaboration with, or with the assistance of others, is indicated as such. Any views expressed in the dissertation are those of the author.

SIGNED: _____ DATE: _____
Gentiana Cheung

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CHAPTER 1: INTRODUCTION

A. Background

Following rapid technological development and the increasing presence of screens in educational settings, learners today have become accustomed to using the Internet, smartphones, and other digital media during their studies (An & Reigeluth, 2012; Knobel & Lankshear, 2017). Short and Uzochukwu (2018) described a new generation of learners who expect to receive information quickly, have multitasking capabilities, and prefer graphics over text. Short and Uzochukwu (2018) also claimed that this new generation requires integrated technologies to be meaningfully embedded into their learning processes.

An Organisation of Economic Co-operation and Development (OECD, 2019) Skills Outlook report observed that digitalisation has transformed how people live and profoundly changed the world of work. Therefore, digital skills are now in demand in work, life, and educational settings. Although Ferrari (2013) defined digital competence as “the confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society” (p. 2), he also specified that the five key areas of digital competence, namely information, communication, content creation, safety, and problem-solving, are not always present. The OECD (2019) Skills Outlook report pointed out that the potential of technology in learning has not yet been fully realised, even though technologies can help learners to develop the necessary skills for the digital future of society.

Educators are challenged by the rapid emergence of learning technologies because they must create different learning experiences and competencies using these technologies to help their students cope with the diverse needs of society. Digital technologies now mediate our social practices and learners are expected to be multiliterate so that they can analyse and construct multimodal texts (Cope & Kalantzis, 2000, 2015). The need for multiliteracy has changed our paradigm to not only understand literacy through conventional printed texts but also consider literacy through other digital and multimodal pedagogies (Cope & Kalantzis, 2000; Lankshear & Knobel, 2011; Street, 1998). The rapid evolution of technology over the past few decades has transformed the way people communicate and communication is no longer limited to printed paper texts. Communication now takes place in a variety of modes on different digital devices, software, and apps, and messages are produced and read multimodally. According to Cope and Kalantzis (2015), communication channels have shifted from material inscriptions to digital coding; that is, they have shifted from printed text to on-screen images. Conventional

representations of communication, such as printed text in textbooks, newspapers, and magazines, have been replaced by screen pixels and people can download e-books, read online news, and browse information on the Web on their smart devices.

The concept of multiliteracies recognises this shift from linearity to modularity (Kress, 2010; Kress & Rowsell, 2019). From a technological perspective, linearity involves text and printed writing, whereas modularity involves digital communications using various modes (Kress & Rowsell, 2019). Most contemporary texts involve one or two modes (i.e., they have multiple modalities) as opposed to one mode (i.e., they are written only).

For these reasons, the issue of how learners experience new learning processes using multimodal resources has recently become an interesting and well-researched area of study. Scholars have conducted extensive research to understand multiliteracy practices from a learner's perspective (Burgess & Rowsell, 2020; Cope & Kalantzis, 2015; Green & Beavis, 2012; Kress & Rowsell, 2019; Lankshear & Knobel, 2014). The question of how educators use multiliteracy study findings requires that scholarly attention be shifted to educators' decisions about the pedagogical designs to use in the classroom. The simple provision of learning technologies without including the proper pedagogical support means that learning becomes relatively superficial (Sung et al., 2016). Therefore, applying digital literacy skills is not only about digitalising texts, but also about thinking and planning in terms of multiple modes. The concept of multiliteracies draws attention to how digital pedagogies have shifted our learning landscape (Kress & Rowsell, 2019). Cazden et al. (1996) identified the following design elements in the meaning-making process: linguistic, visual, audio, gestural, and spatial elements. Following the rapid development of learning technologies in the past 20 years, how have these technologies changed the teaching landscape? How can these design elements in the meaning-making process (Cazden et al., 1996) impact students' overall learning experience? This thesis addresses these two questions.

Almost 30 years ago, Clark (1994) argued that the media are a vehicle of communication but do not necessarily facilitate learning. Kress (2003) and Jewitt (2014) claimed that technologies have driven a revolution in how knowledge is communicated and represented in society. Lacković and Popova (2021) however revealed the marginal use of digital technologies in lectures and students' hands-on response via technology was absent in the ten live recorded lectures that they collected. The ten lectures that were collectively viewed more than a million times and were uploaded by the top-ranked universities in each of the studied countries (i.e.

Canada, Egypt, India, Italy, Japan, Palestine, Russia, Spain, the UK and the US) to either their own websites or YouTube channels. Lacković and Popova (2021) found a “discrepancy between digital education reality from one side and technology hype, recommendations and futuristic vision from the other” (p. 546). In addition, the current OECD Digital Education Outlook (OECD, 2021) report observed the slow digitalisation in educational institutions and called for the increased incorporation of digital tools into formal education to meet the requirements of a digital society.

One of my key research aims was to use multiliteracies to explore the transformation of the educators’ knowledge transfer process. To this end, I unpacked the extent to which multimodality and multiliteracies inform the digital pedagogies of three university educators. I explored how these educators taught at a university-level business school by planning for and thinking about digital forms of teaching and how they made their digital pedagogical decisions when working through multimodalities. I conducted an in-depth investigation of how varying approaches to planning and teaching changed the nature and properties of these educators’ pedagogies. What multimodal and design choices did these educators make in producing their teaching, planning, and pedagogical artefacts? Green’s (2012a) framework provided a way to understand how educators may technically transform traditional texts into multimedia teaching materials, the cultural considerations involved in the pedagogical design process, and how the critical use of multimodalities addresses both institutional demands and student needs. I explored whether Green’s three-dimensional (3D) model fostered a greater awareness of approaches to digital teaching and learning.

In this chapter, to help readers of this thesis understand its structure, I next describe the context within which all the educators resided. I also explain how I connect business education to multiliteracies and consider the university a “figured world.” This chapter also identifies a knowledge gap and described my research questions. In addition, I explain how I positioned myself in this study and attempt to cast a more critical gaze on the interpretation process.

B. Business Education at a Hong Kong-based University

The context of this research study is a government-funded university in Hong Kong, which I anonymise as “UHK” in this thesis. UHK is one of the top research universities in Hong Kong. UHK has recognised the need to enhance students’ digital literacy levels and has asked all of its academic staff to consider digital pedagogies in their planning and teaching. To facilitate

this consideration, the university's learning enhancement centre and information technology centre offers e-learning-related services and resources to both students and faculty. Compared with other schools, the UHK business school is relatively active in encouraging educators to apply for UHK grants to develop innovative coursework and digital materials in addition to improving their teaching methods. The UHK business school, which is in close contact with the industry, aims to ensure that its students have good career prospects by providing business education that best fits the industry's needs. The UHK has provided a specific culture within which all three case study educators and I worked.

In most of UHK's business courses, students are expected to become employable by cultivating their communication, problem-solving, critical thinking, and analytical skills. As an educational practitioner teaching business subjects at UHK, I know that there is a high demand for digital literacy, analytical skills, and communication skills in business. In business courses, it is crucial to explain business theories to students, because their educators must ensure that they can critically analyse and apply these theories in the business world. Therefore, educators must work to ensure that their teaching materials are relevant and applicable in the business world.

Roberts (2012) emphasised the need to adopt learning technologies in the business curriculum. In particular, he observed that university-level business schools have begun to modify their curricula to better prepare their graduates to cope with the technological business environment. Digitalisation is essential to facilitate communication within the business world and enable businesses to access the global market. Business graduates are now required to have knowledge and skills in technological applications for their future jobs. Roberts (2012) stressed that business studies must include technological components to ensure their relevance to students and the business world. In addition to hardware, software, Internet usage, and social media mechanics, the central issues of how educators design their curricula and which technology they adopt are an important new area for study.

According to Mohapatra (2015), the role of a business school is not just to meet the needs of companies to achieve results in the face of intense competition, change, demanding customers, and eco-partners in global markets. Business schools must also meet the needs of their stakeholders, such as advisory boards, alumni, and students. Other scholars have drawn attention to the need for business schools to change their curricula and approach student development to impart the required skills and knowledge so that the students will have the

ability to cope with the complexity, partnering, and customisation associated with the global market (Conger et al., 1999).

How do students perceive the technology used in teaching? Dowling-Hetherington et al. (2020) studied the expectations of business students and found that they effectively used technologies, such as video integration, quiz/poll applications, and simulations, to improve their attendance rates, class participation, and engagement in classroom activities. Dowling-Hetherington et al. (2020) also identified various technology platforms that were not used in a satisfactory manner, such as PowerPoint presentations with too much writing and no graphics, a learning management system (LMSs) with delayed postings, and videos with no comments or discussion. In addition, the students used technologies to clarify course concepts, access information resources, and engage in collaborative learning with other students. Dowling-Hetherington et al. (2020) also questioned the possibility of generalising students as being tech-savvy and called for scholarly attention to educators' roles and responsibility. Educators should respond to the needs of both students and corporations by addressing both students' learning styles and the relevance of technological adaptation to the employment context (Dowling-Hetherington et al., 2020). Similar studies have suggested that educators must reform their teaching styles to better meet the needs of the "Net Generation" because their students expect technologies to be integrated into learning and perceive these technologies as part of the university learning experience (Dowling-Hetherington et al., 2020; Kvavik & Handberg, 2000; McCabe & Meuter, 2011).

Gupta et al. (2020) studied the variables that impact the successful adoption of digitalisation in business schools and found that students' competencies had the strongest influence on the adoption of digitalisation, followed by educators' competencies, and technology diffusion is a close third. Technology diffusion involves the integration of smart devices, adaptive intelligence, augmented reality, and flipped learning. The adoption of these tools has enhanced the quality of students' educational technology experience. Gupta et al. (2020) further noted that educators' readiness and adoption of digital learning technologies is dependent on their university's technology leadership and support services.

Dowling-Hetherington et al. (2020) and Gupta et al. (2020) called for more in-depth studies into why various technological tools were not implemented satisfactorily to understand why and how educators adopt certain learning technologies. However, it is important to understand how multiliteracies function through technology. Therefore, I examined three educators'

perspectives on adopting learning technologies through interviews and their pedagogical materials.

C. Connecting Business Education With Multiliteracies

In understanding how educators use learning technologies in teaching their business courses, it is important to understand teaching through technology and how it functions in students' learning process. The New London Group coined the term "multiliteracies" (Cazden et al., 1996, p. 64) to capture the essence of such digitalisation and technological changes. The New London Group suggested that the concept of multiliteracies can be used as a pedagogical approach to understand meaning-making processes in diverse cultural contexts. They also noted the possibility of understanding how meaning is made through multimodality. I considered it to be important to connect digital pedagogy in business studies to multiliteracies because the technological choices of the educators in the case studies in this thesis could be explored in depth through their meaning-making processes and through the meaning of a vast number of multimodalities.

Some scholars have highlighted students' learning styles and how their information processing differs from previous generations (De Loreto, 2019; Prensky, 2001). Today's students can use technology to learn more effectively than students in the past. In a mixed-methods study, Nouri (2019) found that students tended to shift their meaning making and knowledge building from historical dominating texts to various semiotic resources, such as videos and audio recordings supported by mobile technologies. Nouri (2019) concluded that students were becoming more active designers of their learning processes because of their access to new learning modes. Nouri (2019) also found that students learned more effectively when they had access to technology. He suggested that technologies have transformed monomodal learning practices into multimodal learning practices. In addition, university students have changed their construction and consumption of learning materials using multimodal methods (Nouri, 2019).

Nouri's (2019) findings supported Kress's (2010) argument that "different modes offer different potentials for meaning making" (p. 79). Students tend to use the affordances of different modes (e.g., audio, video, and pictures) to better construct their knowledge and make sense of course content rather than being bound by texts alone. In other words, the use of learning technologies in business education involves applications using many modalities with different types of affordances, modes, and materialities.

Twenty-eight years ago, Clark's (1994) study of technology integration in subject teaching reported that most educators have taken a similar paradigm wherein they see learning technologies as a vehicle that facilitates the communication of information. Twelve years later, Lankshear and Knobel (2006) used the "old wine in new bottles" syndrome to suggest that pedagogical designs using learning technologies have still not been fully (or even adequately) transformed. Lankshear and Knobel (2006) also suggested that traditional classroom teaching using texts can be reproduced technologically, but not fully transformed digitally. Gillen (2015) used the term "virtual spaces" to better describe "research areas and overlaps with terms such as online, digital, Web 2.0 and new media" (p. 370). Gillen (2015) called for a rethink of all aspects of education and argued that educators should not map learning technologies onto the previous curricula. She also called for more research focusing on policymakers, technology specialists, and technology designs, in addition to environments that involve virtual spaces.

I explored the transformation of literacy into multiliteracies through the lens of three educators who teach at the undergraduate level at a business school. I also explored the use of different digital tools' affordances, the meaning-making process in different modes, the pedagogies that the studied educators apply, and carefully examined these educators' choices. The application of technologies is no longer simply the expression of texts using technologies, but now includes the application of various digital mode affordances to meaning-making in the learning process. The "new wine in new bottles" paradigm must be adopted in higher education. I explored the transformation of learning by providing three detailed pictures of three business educators' practices, choices, assumptions, and interests. I also conducted student interviews to illustrate the impact of these educators' digital choices on their students' learning processes.

D. Considering the University as a Figured World

Holland et al. (1998) introduced the figured worlds concept as a larger theory of identity. The figured worlds concept addresses how people can "figure" out who they are through the "worlds" in which they are socially engaged and related through culturally constituted activities. All the university educators with teaching responsibilities in the three case studies in my thesis work at UHK. In understanding how these educators' identities affected their decision-making process in terms of their pedagogical designs, along with how they operationalised these designs through technical applications, cultural considerations, and critical decisions in a 3D framework, it is important to understand the worlds in which these

educators participate. Therefore, I considered UHK as the figured world in which the case study educators taught and most importantly informed their work identity.

Holland et al. (1998) broadly defined figured worlds as a “socially and culturally constructed realm of interpretation in which particular characters and actors are recognized, significance is assigned to certain acts and particular outcomes are valued over others” (pp. 52). From a cultural perspective, UHK actively uses teaching grants and an educator recognition system to promote innovative teaching among its educators. In particular, UHK’s business school offers various teaching grants to encourage innovation in pedagogical designs and rewards educators for their innovative teaching practices. UHK provides educators with a powerful LMS that hosts various platforms and digital tools, such as Panopto, Camtasia, Gradescope, Blackboard Collaborate Ultra, Microsoft Teams, and Zoom. All UHK classrooms have Internet access and all types of audio-visual support to facilitate both face-to-face and online teaching. UHK’s figured worlds allowed me to understand how the provided agency, such as UHK’s financial and technical support, impacted the formation of the educators’ identities in the three case studies.

Holland et al. (1998) pointed out that figured worlds are organised and reproduced socially; therefore, they are dependent on the educators’ interactions with their teaching environment and students over a specific period. Although the three educators lived in the same UHK figured world, their subjective interactions with different UHK contexts may have influenced their adoption of different digital teaching tools. The three educators featured in my thesis taught different undergraduate subjects at UHK. Therefore, each educator adopted different digital teaching tools, such as PowerPoint, YouTube, social media platforms, animated videos, and virtual reality (VR). In my doctoral research, I explored the substance of the studied educators’ changes, how they enacted these changes, and how they made different digital decisions **in the same university** at UHK in depth.

E. The Role of Educators’ Identity

Numerous scholars have examined the central role of identity in research. Scholars have used various approaches to educators’ identity, including identity formulation (Beijaard & Meijer, 2017; Ruohotie-Lyhty, 2018; Varghese et al., 2005) and the relationship between professional development and the affordances of the socio-physical environment (Brooks, 2016; Pappa et al., 2017; Ruohotie-Lyhty, 2011). Holland et al. (1998) applied the term “figured worlds” as a

way of framing identity formation across contexts to broadly conceptualise identities as the “formed and re-formed in relation to the everyday activities and events ordain happenings within in” (p. 53). Holland et al. (1998) also provided a larger blueprint for understanding identity formation in three contexts; that is, negotiation of positionality, authoring space, and world-making space. I used these three contexts to determine how the studied educators “figured out” their roles, how they made their own decisions to create learning materials using varying approaches to digital pedagogies, and how they constructed meaning in their teaching to best meet their students’ needs. By understanding the studied educators’ varying degrees of accepting, rejecting, or negotiating their identity as educators who teach in business school, we can see how their choices are reflected in their multimodal designs.

In my research, I relied heavily on the figured worlds concept to describe the context in which the studied educators developed their multimodal pedagogies. I applied this concept to the UHK context to situate the educators in relation to UHK’s work culture, practices, assumptions, initiatives, and overall priorities. Although they taught different subjects, the studied educators taught in the same business school at the same university; therefore, they should have had the same resources and grant support. However, they adopted different multimodal and design choices in their pedagogical planning, which I explored through their identities derived from the figured worlds at UHK.

F. Research Gaps

In the wake of the COVID-19 pandemic, it has become clear that learning technologies and digital pedagogy are increasingly important for the future of higher education. A simple scholarly Internet search covering the last 5 years returned more than 60,000 results from educational areas such as technology and subject teaching. Only 10% of the search results related to the use of technology in teaching in higher education. Scholars have widely explored how learning technologies are related to the teaching of a particular higher education subject, such as science (Kaya et al., 2017), English (Xu et al., 2019; Xuefeng, 2018), mathematics (Higgins et al., 2019), and health care (Fontaine et al., 2019). However, studies of business subjects such as marketing, management, and finance are very limited, although Ong (2019) focused on the ways learning technologies could be used to teach accounting. There seems to be a large research gap in teaching using digital pedagogies, particularly in university-level business studies. In addition, no multiliteracy studies have explored how these business educators made their digital pedagogical decisions at the university level.

However, many studies have explored how learning technologies influence the effectiveness of teaching and learning from various perspectives. Some studies (Cavanaugh & Jacquemin, 2015; Stack, 2015; Veneri & Zdanis, 2018) have reported significant differences between learning technologies and traditional teaching methods. Other studies have examined the effect of differences in technological advantages on learners' attitudes and motivations (He et al., 2018; Higgins et al., 2019; Scarpin et al., 2018; Short & Uzochukwu, 2018; Weldy, 2018). Various studies have explored how educators' attitudes and competencies (de los Santos & Zanca, 2018; Derting et al., 2016; Watt, 2019) influence their use of learning technologies in teaching. In this research, I focused on how three university educators used learning technologies, mapped onto Green's (2012a) 3D framework as an interpretative tool. I used this 3D framework to delve deeply into the nature of the focal educators' teaching practices, pedagogical choices, and designed learning artefacts.

Many studies of the integration of learning technologies into education have adopted similar paradigms; that is, they have generally seen learning technologies as facilitating the communication of information (Clark, 1994). Scholars such as Boyce (1999) have suggested that learning technologies should be treated largely as hardware-led in the pedagogical framework. Studies of the use of blogs for students' learning and reflection (Agosto et al., 2013; Williamson et al., 2015) have addressed the similar functionality of blogs and paper-based journals and recognised the usefulness of blogging as an interactive technological tool to encourage dialogue among students. In a social media study, Arnold and Paulus (2010) found that social media facilitated community building among students. Ong (2019) used video and whiteboard animations to facilitate teaching and used Blackboard as an LMS to allow students to access course materials, take a short test, and watch videos. She concluded that the use of video and whiteboard animations enhanced students' learning experiences and learning outcomes. Thus, these studies have adopted similar approaches to exploring how different technological tools can be used as a substitute for traditional learning tools.

As social practices in relation to technology are transformed, so are the practices used to make sense of them. For instance, consider a recording of a lecture. O'Brien and Verma (2019) pointed out that students may use the lecture recording to supplement or substitute for face-to-face lectures, depending on the subject. Following the evolution from Web 2.0 to Web 3.0, more interactive functions were incorporated into the digital world and introduced into learning technologies through multimodal means. Current students are familiar with different modes of

representation and the meanings that emerge from multimodality. Therefore, multimodal representations throughout the communication process have become fundamental in anticipating society's evolving needs.

In their well-known work on new literacies, Lankshear and Knobel (2014) observed that participation, collaboration, and distribution are key social practices. In particular, they suggested that technology, knowledge, and skills should be considered co-ordinated sets of actions to facilitate these social practices. In this research, I explored how digital technologies transformed the pedagogies of three business educators who took different trajectories in their implementation of multiliteracies. The world today operates very differently from 20 or 30 years ago and our learning preferences have changed markedly during the COVID-19 pandemic.

Teaching business subjects in higher education is a yet unexplored area, particularly using multimodality. In addition, few scholars have used a holistic approach to address the use of learning technologies in pedagogical designs from a technical, cultural, and critical perspective. Therefore, I relied on Green's (2012a) 3D framework in this thesis to address this issue. Few business studies have adopted Green's 3D model, which covers operational, cultural, and critical dimensions. Some scholars (Beavis, 2012; Rowsell, 2014; Tour, 2012) have recognised the long-lasting capability and relevance of Green's 3D model (2012a) in our fast-moving digitalised world. The 3D model allowed a relevant framework to be used without limiting it to literacies and extended its analytical capability to multiple disciplines in a non-linear format. The theoretical framework of Green's 3D model provided me with a holistic perspective to explicitly explore how the three studied educators used learning technologies according to their technical/operational, cultural, and critical dimensions. I used the 3D model to explore the planning and digital choices based on the identities of the three educators, who are the central investigation objects in my thesis study. To obtain an in-depth understanding of how these educators made their digital pedagogical decisions, I adopted a supplementary tool to help explain the context in which these educators worked, taught, and most importantly, informed their individual work identities. The figured worlds concept was the most suitable tool to explain how these educators made their pedagogical decisions in the UHK context.

I explored why and how the case study educators used certain digital tools to facilitate digital teaching through interview dialogues, focus groups, and pedagogical artefacts.

G. Study Purpose

I chose to pursue this research project based on both my personal and my professional interests in teaching various business school subjects in the higher education context. I saw how my students recently changed their learning practices to incorporate emerging technological devices and applications. In addition, the COVID-19 pandemic further accelerated the implementation of learning technologies in teaching practices. I wanted to investigate how other educators plan for and think about digital methods for teaching business subjects that meet the needs of the new generation of students and how these educators have adjusted their teaching approaches during the pandemic. I also wanted to understand, from an in-depth perspective, how different educators make decisions about their pedagogical designs when working through multimodalities.

I am employed at a government-funded university in Hong Kong (UHK) and the three featured case study educators are my colleagues at UHK. The UHK has strongly encouraged educators to incorporate innovative practices into their pedagogical designs. Numerous grants are offered to educators to develop new courseware. Many UHK educators, myself included, are keen to apply for these grants. UHK students should obtain the most up-to-date and relevant skills for the business world. In addition, educators should use multimodality to deliver their courses and explain the learning content to enhance their students' satisfaction and understanding. Although creating new courseware requires extra effort, more time, and new skills, the opportunity to obtain additional technological resources and support during the development of new courseware was appealing.

However, not all educators have welcomed the support from additional teaching grants. On several occasions, our university grant applications have called for a second or even third round of applications because of an insufficient number of applications. I became interested in three questions. First, how do educators make their pedagogical decisions? Second, how do the overall university policies, cultures, and resources support educators? Third, does an educator's identity play a role in the figured worlds context, which has an impact on their overall decision-making process? Although the university's strategy explicitly encourages educators to adopt learning technologies in their pedagogical designs, it is not clearly explained how these learning technologies could be critically used in their course designs to help the new generation of students.

As a result, I conducted this study to provide an in-depth understanding of how three educators in a business school planned their digital pedagogies. I explored these case studies to obtain insights from these three front-line educators about how they used their teaching philosophy by adopting learning technologies to help their students learn.

Many scholars (Backfisch et al., 2021; Getenet, 2019; Hussain, 2020) have focused on understanding educators' motivation to use learning technologies in their pedagogical planning. However, the issues of determining the use of digital tools, multimodal and design choices addressed by educators during pedagogical planning have yet to be explored in the literature.

At the outset of my doctoral journey, I wanted to conduct a relatively in-depth study to investigate and understand how three business school educators developed their pedagogies to make them more digital and multimodal in nature. I also wanted to better understand which multimodal devices and resources were involved in other educators' teaching practices, how their identities influenced their use of multimodality, and whether pedagogical designs are being newly transformed. I am personally acquainted with all three featured educators; hence, I know that they are all exemplary educators who have been recognised by the UHK with various teaching awards. The findings that I obtained from these three educators through my in-depth study of their digital pedagogical practices, teaching artefacts, and interviews contribute new knowledge and enhance understanding of digital pedagogical practices in higher education business studies, which is an under-explored area to date.

H. Research Questions

My main purpose was to explore how university business school educators made their digital pedagogical decisions when working through multimodalities. Among the following four research questions (RQs), RQ1 is the main research question and RQs 2, 3, and 4 are secondary questions used for in-depth exploration.

RQ1: In what ways do the three business school educators adapt their planning and teaching to digital pedagogies?

RQ2: How do varying approaches to planning and teaching change the nature and properties of the educators' pedagogies?

RQ3: What multimodal and design choices do the educators make for their teaching, planning, and pedagogic artefacts?

RQ4: Does the 3D framework foster greater awareness of approaches to digital teaching and learning?

To answer these research questions and adopt an interpretivist philosophical position, I first applied the theory of multimodality to Green's (2012a) 3D model as the central framework to understand these educators' experiences through three major dimensions: operational, cultural, and critical.

I used the three educators' identities in the figured worlds of their university to explore how their identities affected both their overall design decisions and their pedagogical planning.

I focused on understanding the educators' pedagogical teaching experiences. Based on their teaching experiences and teaching materials, analyses of teaching artefacts, and student feedback, I sought to understand why and how the educators shifted from traditional teaching methods to incorporating various technological applications into their pedagogical design.

Chapter 2 reviews the concepts of multiliteracies, multimodalities, the 3D models and the figured worlds. I review key literature related to multiliteracies, 3D model and connect the figured worlds concept to the 3D framework. This chapter considers UHK as the context which facilitate my in-depth exploration of the focal educators in their pedagogical planning. I also present a new visual representation that illustrates the relationship of the 3D model and UHK as a figured world.

Chapter 3 presents the methodology, including my philosophical position, research context, research design, ethical consideration, data collection method and data analysis approach.

In Chapter 4, I document how these three educators adapted their planning and teaching to digital pedagogies. I use a holistic approach based on Green's 3D model to understand their multimodal use. I analyse how the operational, cultural, and critical dimensions of the 3D framework played out in the pedagogical design process. I also demonstrate how UHK, as a figured world, can be connected with the 3D model and how it can be used as supplementary concept to enhance our interpretation of the three educators' decision-making processes and their planning and pedagogical approaches.

In Chapter 5, I perform an in-depth exploration of the three educators' pedagogical practices through their online teaching materials, such as PowerPoint slides and animated video clips. I

demonstrate how to operationalise the conceptual 3D model using operational, cultural, and critical approaches based on the visual analysis techniques recommended by Ledin and Machin (2018). In both Chapter 4 and Chapter 5, I reveal how the educators' identities influenced and drove their decision to change their digital pedagogical practices. Green's (2012a) 3D framework provided a way to understand how these educators transformed traditional texts into various multimedia teaching materials, what cultural considerations were involved in the pedagogical design process, and how the critical use of multimodality addressed both institutional demands and the students' needs.

I used Green's (2012a) 3D framework to formulate the interview questions. I based these interview questions and my interpretations of the educational artefacts on the operational, cultural, and critical dimensions developed in Green's (2012a) 3D model. Image 1 illustrates how I used Green's (2012a) 3D model to structure the questions in my thesis study. The learning experience of multiliteracies can be explained using Green's (2012a) suggested 3D lens, which helped me to excavate the contrasts between the three educators' teaching styles. My findings can guide pedagogical strategies based on multiliteracies and digital literacies that can be applied in various contexts, such as business classes in higher education institutions.

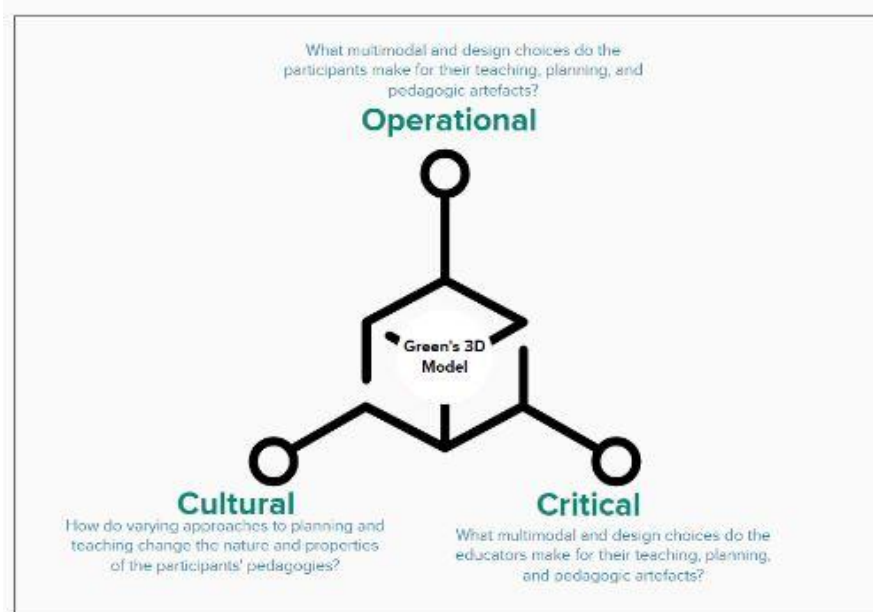


Image 1: Using the 3D model to map research questions

I. Researcher's Role and Reflexivity

I teach various business courses at the UHK business school to undergraduate students using multiple digital platforms and tools. An educator must provide their students with the most up-

to-date knowledge possible; therefore, the students need pedagogies that are faithful to digital and multimodal forms of teaching and learning. I have constantly updated my knowledge about technological applications over the years, including digital platforms, communication apps, learning software, and LMSs. I habitually evaluate various digital platforms during my classes and the technological tools I adopted are usually fine-tuned or replaced at the end of the academic year following self-reflections and reviews of my students' course evaluations.

Interactive teaching environments are necessary to keep my teaching fresh and maintain my students' engagement. I incorporate activities into my teaching practice with the assistance of technological tools that I believe could motivate my students' learning during classes and involve a healthy amount of interaction. I have increasingly used digital tools and online platforms to enhance my students' in-class or virtual interactions. I have spent time upgrading my knowledge by attending workshops and trialling new learning technologies in the classroom. Following constant self-reflections on my teaching practice, I have modified certain platforms based on my students' feedback because their higher education must stay up to date in terms of market knowledge and digital literacy.

UHK strongly encourages its educators to use technological tools in their teaching by providing several types of support, such as grants, teaching assistants, and technological facilities. Accordingly, I received some grants to develop tools for digital teaching. The positive comments and feedback I have received over the years are my greatest motivation to continually adopt learning technologies in my teaching practice. Many other educators also use these university grants to develop digital teaching materials, although the majority continue to use traditional pedagogy designs. Our university's grants primarily reward innovation and digital work. Two of the educators in my thesis study actively sought university grants to support their creation of new pedagogical tools.

My close working relationship with two of the three educators in this thesis study facilitated my data collection and follow-up processes. When I analysed these educators' identities, my personal understanding of their backgrounds assisted the in-depth interpretation process. I have strong content knowledge of the topics taught by these educators and I also use multiple technological applications in my pedagogical designs. As a leader in the UHK business school, I recognise the need to constantly upgrade my teaching delivery and experiment with different technological applications in my classes. I constantly fine-tune my pedagogical design based on class observations and my students' feedback. If I have a positive experience with certain

technological teaching applications, I usually recommend these applications to the educators in my department. Educators usually do not mind adopting new digital teaching tools if they are easy to use and help improve the end-of-semester course evaluations.

Motivated by my personal experience, I was interested in conducting an in-depth exploration of the teaching practices of educators who adopt learning technologies in their classes. In this thesis study, I aimed to improve understanding of how learning technologies can inform educators' pedagogical choices through a multiliteracy lens, including how the 3D model proposed by Green (2012a) can be used to select certain technological tools, and how the educators' identities determined their technological choices throughout the process.

My personal teaching experience in business subjects and my relationship with the three educators in the case studies helped me to reflect on and obtain a deep understanding of their pedagogical planning and designs. Using an interpretivist lens, I explored how these educators adapted their planning and teaching to digital pedagogies. My digital pedagogical knowledge helped me to understand and interpret these educators' interviews and teaching artefacts in depth. My knowledge of business teaching helped me to explore important issues and choose appropriate follow-up questions when these educators used approaches or designs that differed from my own approaches and designs. My relevant teaching experience within the same group of business school students as the three educators also equipped me with a critical lens when analysing their teaching artefacts and interpreting the interviews.

J. Chapter Summary

This chapter identifies a research gap in digital pedagogies and teaching practices, particularly in university-level business studies. A multiliteracy approach has not been used previously to explore how university-level business educators make their digital pedagogical decisions.

After explaining the university context within which the educators worked and connecting higher education business studies with multiliteracy, I describe my use of Green's 3D model supplemented with the figured worlds theory as my research framework.

This chapter also describes my research questions and how I positioned myself in this thesis study. I offer clear descriptions of my role and reflexivity in this chapter to provide greater transparency about my philosophical position and help my readers to more easily understand my study focuses through an interpretivist lens.

Chapter 2 provides a literature review that addresses key concepts, such as multiliteracies, multimodalities, 3D models, educator identities, and how I attempted to interpret multimodality and figured worlds using the 3D model.

CHAPTER 2: LITERATURE REVIEW

A. Introduction

While searching for a suitable framework for this study, I gravitated to multiliteracies (Cope & Kalantzis, 2015; Gee, 2009; Knobel & Lankshear, 2006; Kress, 2010), 3D models of literacy (Green, 2012), and participatory literacies (Rowse & Wohlwend, 2016) because my emphasis on digital pedagogies. I compared these studies' concepts, pedagogical applications, epistemologies, and advantages and disadvantages (Gillen, 2014). I found that the applicable works on multiliteracies and participatory literacies lent themselves well to applications in the field of language and English as a second language (ESL) education. Green's 3D model (2012a) offered a holistic concept that covered different perspectives. The level of application was more flexible and was not necessarily limited to reading written texts. This 3D framework may help to foster greater awareness of various approaches to digital teaching and learning.

I needed to use a practical and flexible framework with a solid theoretical foundation that would explain my findings so that they could be applied to teaching business subjects. Green's (2012a) 3D framework offered interwoven operational, critical, and cultural dimensions. Tour (2012) commented that the 3D framework represents comprehensive multidimensional perspectives of the complexity of technology and literacy in education. In addition to using the 3D framework for language education-related research (Burgess & Rowse, 2020), many researchers have used Green's (2012a) 3D framework for studies in various disciplines, such as media education (Durrant, 2012), process drama (O'Mara, 2012), digital games and ESL education (Beavis, 2012), and English literacy (Tour, 2012).

B. Multiliteracies and Multimodality

1. Defining Multiliteracies and Multimodality

With the rapid development of technologies, particularly the creation of digital spaces and the incorporation of visual, audio, and textual elements, traditional literacy definitions that involve monomodal, text-based meaning-making and representation are being challenged. In the mid-1990s, the New London Group, which was convened by Kalantzis and Cope and included the scholars Cazden, Fairclough, Gee, Kress, Luke, Michaels, and Nakata (Cope & Kalantzis, 2015), gathered for a week-long meeting to discuss the impact of the rapid development of digitalisation and Internet communication on literacy and pedagogical designs. The New

London Group developed a multiliteracies framework to recognise the essence of digitalisation and recent technological changes. Cope and Kalantzis (2015) later provided a detailed explanation of their framework. In their book, Cope and Kalantzis (2015) described the multiple ways that globalisation forced people to use multiple modes of representation and meaning-making in their communications via mass media and the Internet. It is no longer sufficient to define literacy solely in relation to reading texts for the representation and understanding of meaning-making. Cope and Kalantzis (2015) recognised that the rapid development of communication technologies incorporates a vast number of modes, such as texts, images, sounds, gestures, objects, and space, into social media to produce meaning-making during the communication process. The New London Group (Cazden et al., 1996) recognised the relationships between textual form and social context and between monoalphabetic literacy concepts and semiotic modes by pointing out that multiliteracies have “many modes of representation much broader than language alone” (p. 64). In their two-fold explanation of multiliteracies, Cope and Kalantzis (2015) observed that multiliteracies “set out to address the variability of meaning making in different cultural, social or domain-specific context[s]” (p. 3). That is, meaning is constructed through multimodality. Therefore, multimodal meaning is expressed through the connection of written linguistic modes to oral, visual, audio, gestural, tactile, and spatial modes.

Gillen (2015) used virtual spaces to capture the continuity of literacy research in virtual worlds. She stressed that Web 2.0 is a highly interactive platform that provides participatory spaces across digital environments. She also pointed out that virtual spaces apply multimodalities that are interwoven within their socio-cultural contexts.

Among others, Kress and Van Leeuwen (2020) developed the field of multimodality based on the contention that there are always two or more modes in play in every text. They suggested that communication is seldom expressed in a single mode. In addition, textual meaning comes not only from language but also from other modes, such as images, sounds, and language (Kress & Van Leeuwen, 2020).

As leaders in the multimodality literature, Kress (2003, 2010) and Kress and Rowsell (2019) contributed a vast amount of scholarship on multimodality and its connections to multiliteracy development. Kress (2009) described multimodality not as a theory but as a “field in which meaning is made” (p. 19). By clearly defining terms such as modes, affordance, and the materiality of modes, Kress expanded our understanding of multiliteracies from a linguistic-

centred perspective to a more socio-semiotic perspective. Kress (2003) draws our attention both to the connectivity of literacy and to its social, technological, and economic factors. According to Kress (2010), modes are “socially shaped and culturally given semiotic resources for making meaning. Image, writing, layout, music, gesture, speech, moving image, soundtrack and 3D objects are examples of modes used in representation and communication” (p. 79). In particular, Kress (2003) used the word “materiality” to describe the functions of a mode. For instance, sounds can have energy variations, such as loudness and softness, and sounds vary in pitch when voices rise or fall or speakers use longer or shorter vowels. In addition, the materiality of modes produces different meanings and serves different purposes in the communication process. Kress (2010) used the term “affordances” to describe this phenomenon; however, he also emphasised the social nature of using modes, in which “the uses of mode constantly reshape its affordances along the lines of the social requirements of those who make meanings” (p. 82).

2. Applying Multiliteracies and Multimodality

Lankshear and Knobel (2006) pointed out that new forms of social practices have emerged at a rapid pace due to technological development. Accordingly, I did not focus on any particular technological devices or applications but instead attempted to understand the educators’ overall adoption of learning technologies. In particular, how cyberspace learning co-existed with physically situated learning was relevant to my thesis study (Lankshear & Knobel, 2006).

The discussion of new literacies and multiliteracies has been developed since the early 1990s (Buckingham, 1993), when researchers focused on addressing meaning-making processes through contemporary conditions. The idea of “new literacies” was originally proposed by Street (1998) and fine-tuned by the New London Group when they recognised literacy as arising not only out of word-based formats but also out of multimodality. Lankshear and Knobel (2006) suggested that “contemporary changes have impacted on social practices in all the main areas of everyday life” (p. 24). For instance, the written form of communication has been replaced by post-typographic texts, including text messaging, digital semiotic language, mouse manipulation, reading file extensions, uploading camera images, inserting text into a digital image, inserting sound into an image, and building multimedia platforms.

Lankshear and Knobel (2006) connected learning technologies to new literacies and introduced a new paradigm by explaining the “new technical stuff” and the “new ethos stuff” (p. 25). They

pointed out that today's learners have moved on from the modern paradigm to the postmodern paradigm. They described learners as complex actors who "see the world from many perspectives" (p. 48) and live their lives using more complex ways of "thinking, speaking, valuing, judging, deciding, and acting" (p. 49). They talked about how people's lives are being organised differently because changes in practices evolve through the generation, communication, and negotiation of the meanings of encoded text. For instance, technologies have enabled travellers to maintain their personal relationships and communications using and designing multimodalities, such as WhatsApp, Facebook, Instagram, Skype, email, and live chats. As a result, learners have also become adept in "multitasking" and more digitally proficient (p. 59).

Web 2.0 (O'Reilly, 2005) enabled consumers to become producers. Web 3.0 has enabled new ways to identify consumer preferences and behaviour (Rudman & Bruwer, 2016). Subramanian (2022) defines it as 'a decentralised internet where a community of users own, control participation, switch seamlessly between services/platforms and share the rewards of using the ecosystem' (p.44).

This improvement to Web 2.0 involved a different worldview focused on service, which enabled private consumption and production based on collective participation, collaboration, and distributed expertise. Google, Wikipedia, Amazon, and Flickr are representative examples of websites that have been enhanced with functions to identify consumers' behaviour and recommend related information for their further use. Web 3.0 has also introduced spaces such as blockchain, NFT and the Metaverse to elevate users' interactive experiences.

Considering the presence of different technological devices and digital platforms, it would be interesting to explore whether educators consider that the adoption of digital methods implies different teaching modes. Kress (2009) provided insights into how learning technologies can be connected to teaching through the consideration of multiliteracies and multimodality. He defined modes as "socially shaped, culturally available material for representation, which exhibits regularities of use as understood by a group" (p. 39). Modes are sounds, pictures, and writing that can be represented in different multimodal means, such as videos, websites, PowerPoint presentations, and animations. Kress (2004) suggested that different modes carry different meaning-making functions, and the mixed use of multimodality could improve communication. In this thesis study, I examined users' preferences for different multimodal

media, how educators adjusted their teaching materials using technologies, and the use of different teaching media to maximise learning.

In his discussion of socio-semiotics, Kress (2010) addressed the recognition of students' interests. The question of who selects the meaning-making modes within a particular context is interesting. For example, it is common for educators to specify a learning platform and for students to follow their recommendations. In addition, physical and digital spaces are also important when considering how to design teaching modalities to best suit the evolving needs of higher education students.

Take PowerPoint presentations as an example. Students are no longer satisfied with sitting in a classroom reading and listening to presentations comprised of mainly on-screen texts. Educators (e.g., myself) tend to use graphics, pictures, and animations in PowerPoint slides instead of text slides. This shift from using text to using more graphics in a PowerPoint slide was originally intended to cater to learners' preferences. As practitioners, we might not be aware of the functionality and meaning-making possibilities that may carry over from different modes and means. Adami and Kress (2014) argued that the composition of multimodalities represents meaning. They also stressed that multimodality is "an approach not a theory" (p. 234).

From a practitioner's perspective, the decision to use modes such as audio, images, and text in a PowerPoint presentation depends on the meaning of these materials to assist the presentation in a relevant context. The educator makes these decisions to communicate their intended meaning using multimodalities. Kress (2014) suggested that different modes have different affordances, where each mode may be capable of fundamentally representing certain meanings more effectively. For instance, using a drawing to illustrate a customer's shopping journey differs from a description of the customer's shopping experience in an essay.

Adami and Kress (2014) used the terms "linearity" and "modularity" to explain different website layouts. Their insights into understanding the different placements of modes through text composition, the functionality of modes, and the cohesion and coherence of texts helped shape the focus of my thesis study. Jewitt (2014), Machin (2007), and Machin and Ledin (2020) have provided practical advice on how to analyse multimodality and understand how meaning is made through different presentations. In particular, Ledin and Machin (2018) provided insights into how meaning is made through typography, which uses colours and various page

layouts. Their suggestions on how to analyse images from the connotative and denotative perspectives helped me to analyse the teaching artefacts (Ledin & Machin, 2018; Machin & Ledin, 2020).

Adami and Kress (2014) emphasised that multimodal compositions are dependent on material/sites. When applied to educators' pedagogical planning, it is important that educators understand how different modes and digital media function in the teaching contexts of specific subjects. Educators must understand what meanings these multiple modes represent before making their digital choices.

Web 2.0 has produced and generated far more information to facilitate “other activities” than Web 1.0. Accordingly, Lankshear and Knobel (2006) suggested that technology should not be interpreted as merely a “tool” to transfer information; rather, the evolution of technologies has enabled new meaning-making processes in daily life. For instance, digital devices, such as computers, printers, podcasts, and gaming hardware, have driven different applications for text, sound, image, digital video, word processing, animation, and communication functions, which rapidly enable sharing, publishing, remixing, and sample effects in the meaning-making process.

In this way, digital technologies have enabled faster and more effective communication of meaning. This shift from material inscriptions to digital coding has unleashed new possibilities for the communication process. Daily communication is not limited to printed texts, but involve reacting to more complicated channels, which are fully equipped with multimodality functions. For instance, instead of using a printed memo or letter, an email can quickly be sent to hundreds of people, which quickly generates discussions and feedback. Social media news websites enable information to be shared around the world in an instant, which solves the time and space constraints associated with the texts printed medium. User-generated applications, such as YouTube, make sharing information easier. The simple operations of these applications enable people of all ages to participate in meaning-making; that is, even young children can post and share their own videos.

With the assistance of modern technologies, communications have become overall easier for a wide spectrum of people. These new learning technologies have provided learners with a greater ability to create what they want and make meaning, which is not limited to “texts” in the conventional sense.

Participation, collaboration, and the distribution and dispersion of expertise and relatedness are integral aspects of the “ethos” championed by Lankshear and Knobel (2006).

This section discusses the concepts of multiliteracies and multimodalities and their application to understanding and analysing digital pedagogies. In the next section, I explore how Green’s 3D model was developed from the conceptual multiliteracy framework, formulated as a holistic conceptual model that covers the operational, cultural, and critical dimensions, and how it has been operationalised by other scholars in various disciplines.

C. Defining the 3D Model

1. Understanding the 3D Model as a Theoretical Framework

Green (2012) claimed that he originally developed his 3D model of literacy in 1988 for English compositions. The three operational, critical, and cultural dimensions involve concepts that were originally developed to understand literacy according to three interlocking and interrelated dimensions (Green, 2012). Unlike other major scholars (Cope & Kalantzis, 2000; Street, 1998), who defined literacy from both language and pedagogical perspectives, Green (2012) stressed that literacy should not exist in a single generalised form, but that different literacies should correspond to different subject areas. Many literacies have emerged in different subject areas and have been categorised by various researchers (Jones & Hafner, 2012), including digital, information, critical, media, business, and multicultural literacies. In the New London Group, Cope and Kalantzis (2000) coined the term “multiliteracies” to acknowledge these various literacies and their connection to socio-cultural practices.

Following the rapid development of digital pedagogies, especially in the wake of the COVID-19 pandemic, multiliteracies and multimodalities have become increasingly important areas to inform digital education. Green (2012) originally developed his 3D model as a concept and strongly emphasised the importance of the context in which he interpreted literacy as a kind of situated specific competence with regard to using written language. However, while literacy is connected to technology and is holistic, to date, the 3D model has no precisely defined design. Beavis and Green (2012) argued that technologies are already playing an integral role in literacy and that the 3D model has the capacity to highlight the intersection of literacies and technologies. Considering that literacies are overextended and interpreted in different subject areas following the rapid development of learning technologies, researchers in different subject areas have broadly adopted the 3D model. Rowsell (2014) recognised the long-lasting

capability and relevance of Green's 3D model for the fast-moving digitalisation world. Without being limited to literacy, the 3D model has offered a relevant framework and its multidisciplinary analytical capability has been extended to non-linear formats.

In an early explanation of the 3D model, Durrant and Green (2000) attempted to explain the three strata of the model that more or less correspond to operational, cultural, and critical dimensions. They also compared the 3D model with the four resources model by Freebody and Luke (2003). The three-strata explanation fits well in the language literacy literature, whereas the four resources model can be used to address issues in the fields of educational policy and curricula.

Green (2012a) proposed new elaborations on literacy using “operational – technical, cultural – discursive, critical – reflexive” (p. 37) dimensions. His explanations have opened up new possibilities for educators to consider a more holistic approach to their pedagogical designs in practice. As an educator teaching business subjects, I am keenly aware of the need for students to obtain several digital literacy skills such as the ability to “find, understand, evaluate, create and communicate digital information in different formats” (Florjančič & Wiechetek, 2019, p.326). In the 21st century, digital competences have become one of the key capabilities that students must acquire to support the other subject-specific competencies needed for employability and social inclusion in the business world (Florjančič & Wiechetek, 2019).

The technical aspects of teaching involve the exploration and implementation of digital tools, social media, and digital literacies (tools, procedures, and techniques). How can texts be represented using multimodality? How do students learn? These complicated processes described above have provided interesting areas for scholars to explore using the operational dimension (Green, 2012). Thus, Lankshear and Knobel (2006) started the discussion of new literacies and their connections to learning technologies, which has shifted the paradigms of text-based communications through print formats to digital multimodal representations. However, the operational dimension is not time-bound and it offers scholars the flexibility to explore new literacies in this new technological age. More recently, Kress and Rowsell (2019) argued that literacy moves from linearity to modularity.

The cultural dimension of the 3D model was elaborated by Green (2012) as being discursive in recognition of Gee's (1990) foundational work in literacy as constructed through socio-cultural practices where meaning is made through subject-specific contexts.

Green (2012) explained the critical dimension of the 3D model as reflexive. He suggested that to function effectively, students need to understand the meaning system of the culture, but because meaning systems are always selective and sectional, they therefore need to be given access to the grounds of selection and the principles of interpretation. Thus, in the teaching process it is critical that students are provided with ‘more critical insights into the processes and possibility of knowledge production, their own and that of the culture’ (p.7). For instance, students must learn outside of the classroom. This critical dimension can be extended to learners developing their meta-cognition and abilities to apply their newly learned digital skills. According to Green (2012), the pedagogical approach itself is therefore critical because it enables students to not only ‘participat[e] in the culture, but also transform and actively produce it’ (p.7).

The critical dimension has traditionally involved exploring issues of power. Many researchers and educators have actively contributed to the field of critical literacy (Comber, 2016; Janks, 2010; Vasquez, 2017). Educators have better access to different affordances and can select appropriate modes and means for teaching. Comber (2016) pointed to the possibility of educators holding a more dominant position if they designed their own courses. In this study, I explored the relationship between learners and educators. With the active role played by learners as producers, it is questionable whether educators still hold a “power” position in their relationship with learners. The issue of how educators consider learners’ preferences and literacies during the course design process is an interesting area worth exploring to address the “power” disparity.

2. Applying the 3D Model as a Theoretical Framework

As an institution, UHK offers rich cultural diversity with a vast number of faculty members and students from different countries. UHK educators are given full autonomy in their pedagogical design and planning. In this thesis study, I required a framework that was flexible and accounted for culture and criticality, and Green’s (2012a) 3D framework met these requirements. The flexibility of the 3D model has made applicable to pedagogical practice, to research in various subject areas, and perhaps to school policymaking. I used the 3D model in this thesis study to develop a “business digital teaching” pedagogical design and provide a framework for a conceptual model to support educators in the context of university-level business education. According to Green’s model, three dimensions of literacy interact “simultaneously in any literacy event, and not hierarchically” (Green, 2012b, p. 175). In

addition to understanding the use of technology from the operational dimension, the model helped me to comprehend how educators make their digital choices from the UHK figured world. The critical dimension offers perspectives from which we can grasp the roles played by educators and learners.

The educators in this thesis study were situated in the university context and taught business-related subjects in the same business school. Although their teaching topics differed, they work in a similar discipline and context. Therefore, I was able to explore further how educators working in similar cultural contexts enacted learning technologies differently in their pedagogical designs and classroom practices.

Janks (2010) pointed out that merely analysing text is insufficient for understanding critical literacy and suggested that educators give learners opportunities to use multimodality in their learning practice. I found this suggestion was useful in my thesis study because it helped me to frame my interview questions around space, time, and multimodal means so that I could understand how the focal educators designed their digital pedagogical materials and lesson plans.

Vasquez (2017) commented that learners are active producers, which enhances their critical literacy learning. These ideas were useful while I was designing the interview questions. I am interested in how educators make multimodal choices when they design assignments, learning activities and projects to help students engage in self-reflection and demonstrate their ability to critically analyse theories to generate new ideas. Many scholars have attempted to understand the quality of teaching by comparing traditional teaching modes with online teaching modes. Ortega-Maldonado et al. (2017) found that traditional teaching modes result in better teaching quality, whereas Harrison et al. (2017) showed that online teaching modes result in better learning outcomes. In this thesis study, I sought to understand how educators chose the multimedia modes or devices they used in their teaching practice.

One of my goals in this thesis study was to understand educators' experiences in using learning technologies to teach business subjects in the higher education context. I needed a comparatively flexible framework to supplement the subject-specific context and further explore the influence of learning technologies on teaching. Although both Cope and Kalantzis (2000) and Green (2012) considered multiliteracies from a contextual perspective, Green's 3D model offered a generative and participatory way to explore multiliteracies. Crucially, the

model helped me to differentiate the detailed portraits of the three business educators in the case studies with respect to the association of meaning-making in a specific subject area. Therefore, the 3D model was a good choice as a framework for my focus on these educators' teaching experiences in higher education business subjects.

3. Applications of the 3D Model in Contemporary Research

To my knowledge, no other scholars have applied Green's 3D model to business education contexts. In particular, few have applied the 3D model in their research. However, some scholars have adopted the 3D model in studies of English curricula (Burgess & Rowsell, 2020; Nixon & Kerin, 2012), the affordances of digital devices (Laidlaw, 2015; Laidlaw et al., 2021; Laidlaw & Wong, 2016), ESL education (Tour, 2012), and the use of digital games in English teaching (Beavis, 2012). Scholars have also used the 3D model in studies on media education (Durrant, 2012), drama education (O'Mara, 2012), and design multiliteracies (Faulkner et al., 2012).

All of the studies above and the work of Nixon and Kerin (2012) were based on the operational, cultural, and critical dimensions in Green's 3D model. Green (2012) suggested that these operational, cultural, and critical dimensions are equally important and none of them have a higher priority than the others. Green (2012b) argued that the three literacy dimensions interact "simultaneously in any literacy event, and not hierarchically" (p. 175). In reality, however, more studies have focused on the cultural dimension and fewer studies have explored the critical dimension. In this thesis study, I sought to determine whether the critical dimension can be used as the focus of the in-depth exploration process. The critical dimension helps to explain how educators provide their students with access to learning technologies through multimodality, and to "enable individuals not simply to participate in the culture but also, in various ways, to transform and actively produce it" (Green, 2012c, p. 7). Burgess and Rowsell (2020) used Green's 3D model as their guiding framework to understand the application of language education to a group of refugee learners who had resettled in Canada. They also addressed the unique simultaneous feature of the 3D model in which the operational, cultural, and critical dimensions worked in unison instead of sequentially or

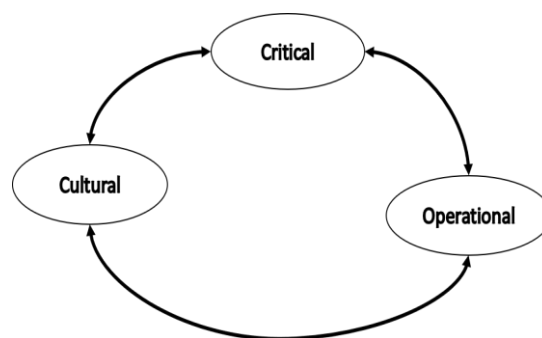


Image 2: The 3D model (Durrant & Green, 2000, p. 98).

developmentally. Burgess and Rowsell (2020) strongly suggested that Green's 3D model possessed the flexibility and conceptual strength to help understand multimodal assessment and they successfully adopted the operational, cultural, and critical dimensions to unpack their multimodal artefacts and understand the meaning of the data that they collected through multiple workshops.

Durrant (2012) examined the usefulness of the 3D model in media education. Like Nixon and Kerin (2012), he agreed with Green that none of the three dimensions should have priority over the others, but he pointed out that the two-dimensional representation (Image 2) of the original 3D model was problematic. It is true that readers were unable to "hold all three dimensions in focus at the [same] time" (Durrant & Green, 2000, p. 92).

Durrant (2012) used a fan (Image 3) to represent the application of the 3D model in his own study. From a reader's perspective, however, it is difficult to understand the motion of a model that has been drawn on paper. Accordingly, in my thesis study. I further explored how to best represent Green's 3D model.

O'Mara (2012) took an ethnographic approach to reflect on her drama teaching process. She admitted that Green's 3D model was useful to examine how she constructed

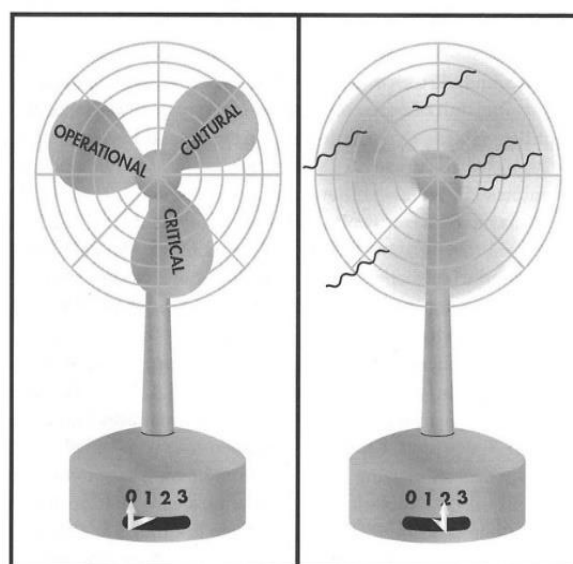


Image 3: Durrant's (2012) representation of the 3D model as a fan (p. 94).

her teaching practice. Interestingly, O'Mara (2012) concluded that her study "has raised significant issues for (her) as she worked through issues of the personal power of the educator, and the complexity of the ethical stance required in each moment of my interactions with students" (p. 112). I found Mara's awareness of how educators exercised their power in the curriculum design process inspiring and worthy of further exploration. To this end, the 3D framework developed by Green (2012) suited my holistic and in-depth approach in this thesis study. The different layers of the 3D framework work from the operational level, which allowed me to understand the basic tools (Laidlaw, 2015), the textual implications of various social influences using a cultural perspective, and the decision-making process from a critical perspective. Many of the scholars (Durrant, 2012; Nixon & Kerin, 2012; O'Mara, 2012) cited

here operationalised Green's 3D model in various disciplines, but they did not explore the field of business. All these scholars agreed on the simultaneity of the three dimensions and the need to extend the cultural dimension to explore meaning-making through multimodalities in the digital environment. In addition, they identified the transformational pedagogies used to translate texts into different materialities using videos, audio, and images. Scholars have generally discussed the critical dimension at the inclusion level, which addresses how educators decide to adopt certain multimodalities. Only O'Mara (2012) asked how educators should exercise their power when making their digital pedagogical choices. Therefore, I consider the 3D framework to be a good starting point for my in-depth exploration of how and why teachers make digital pedagogical choices multimodally, how power plays a role in teachers' decision-making processes, and how teachers' critical actions enable further student participation and learning.

This section discusses Green's (2012) conceptual 3D model and how it has been operationalised by scholars. In the next section, I explore how educators, as the core figures of this study, can be incorporated into Green's 3D model by understanding their identities as educators.

D. Educators' Identities

1. Understanding the Figured Worlds at UHK

Holland et al. (1998) developed the figured worlds concept to elaborate on the relationship between self and identity. Identity is formulated internally and is shaped by external influences with socio-cultural interactions. Holland et al. (1998) explained that the meaning of identity is constructed through interactions with peers based on actions and conversations. They suggested using the figured worlds, positionality, space of authorship, and world building as analytical tools to more deeply explore identity-related issues. They stressed the importance of seeing artefacts and materiality as mediators of human action. In this thesis study, I considered UHK as a figured world when analysing the interview excerpts and teaching artefacts, such as PowerPoint slides and videos. However, any discussion of how educators include PowerPoint presentations and videos in their teaching practices from a technical and cultural perspective in addition to their critical decisions addressed only the implementation level. It is important to understand how the figured worlds at UHK influenced the participating educators and to identify all their positional actions and decisions regarding pedagogical designs. Holland et al.

(1998) described figured worlds through a “person’s abilities to form and be formed in collectively realized ‘as if’ realms” (p. 49). I explored in depth how the figured worlds at UHK have a socio-cultural influence on the studied educators and how their identities reacted to UHK’s figured worlds.

Holland et al. (1998) suggested positionality as another context that can help us to understand identity formation. According to Holland et al. (1998), positionality can be used to address how identities are formulated through positional power or influence. They defined positional identities as “aspects that have to do with one’s position relative to socially identified others, one’s sense of social place, and entitlement” (p. 125). According to Holland et al. (1998), power is related to position. The educators in this thesis’s three case studies based their positional identities on their employment as UHK educators, which can be interpreted as entitlement based on Holland et al.’s definition of the term. These educators have also received various awards recognising their skills as educators, which can be interpreted as creating socially identified positional identities. Therefore, I was interested in how these educators’ positions influenced their multimodal choices of teaching practices, artefacts, and pedagogical approaches.

Holland et al. (1998) proposed authoring as the third context for identity formation. They credited this concept to Bakhtin’s (1981) dialogism, that is, “the world must be answered – authorship is not a choice – but the form of the answers is not predetermined” (Holland et al., 1998, p. 272). The open-ended nature of the authoring process suggested that “the self is the nexus of a continuing flow of activity and is participating in this activity, it cannot be finalized” (Holland et al., 1998, p. 173). In other words, identity formation is a continuous process that involves both individuals’ internal thinking and external influences.

Following the figured worlds concept, I considered the context within which our educators are situated. In this section, the figured worlds at UHK helps inform the studied educators’ agentic actions (Holland et al., 1998, p. 278) and I examined how their positional identities are formed in the UHK context. UHK is a government-funded public research university where the Senate Committee on Teaching and Learning oversees the teaching and learning at the university. Outstanding educators at UHK are recognised with a University Education Award. In addition, a Faculty Teaching Excellence Award is offered by the UHK business school to recognise outstanding educators. The award criteria include superior acumen in teaching, course design,

and leadership in teaching practices. All three of the case study educators are recipients of these awards.

In addition, educators at UHK are supported through grants, technical and technological hardware, and software assistance. Many of these grants are designed to encourage educators to use learning technologies in developing their courseware. Therefore, free technological tools are offered to all educators across the university and they can adopt tools that suit their teaching practices. In addition, a comprehensive e-platform is available to both students and educators for e-learning related resources, applications, and support. UHK uses a powerful LMS that hosts all kinds of platforms and tools for supporting teaching and learning, such as Panopto, Camtasia, Gradescope, Blackboard Collaborate Ultra, Microsoft Teams, and Zoom. All three of the case study educators used these facilities.

2. Connecting Educators' Identities to the Figured Worlds at UHK

Understanding how the case study educators composed their teaching materials requires a deeper exploration of how these educators oriented their materials not only around a particular interpretation of “digital” pedagogy, but also their inclusion of digitally mediated business education content. In his book on educators’ subject identity and professional practice, Brooks (2016) highlighted the importance of considering an educator’s professional knowledge based not only on what they do but also on who they are. In addition, she discussed how educators’ identities are related to their professional practice with some examples. For instance, there was story about a geography educator who had strong desire to teach and was able to design effective teaching approach for his subject teaching. Another story was about how a teacher with strong humanity interests integrate her knowledge to her geography teaching. The three educators I focused on in my thesis study all work in the same university at UHK; however, they all possess their own unique professional identities and responded differently to UHK’s demands concerning digital pedagogies, especially during the COVID-19 pandemic, by creating their own digital pedagogical designs.

The figured worlds concept proposed by Holland et al. (1998) helped me to explain how UHK’s figured worlds impact the overall development of educators at UHK and how they made their digital pedagogical decisions. By understanding these educators’ beliefs and values, we can improve our understanding of how these beliefs and values informed their various pedagogical

decisions and how they present and express their beliefs and teaching philosophies in their teaching practices.

Brooks (2016) provided me with the important concept of seeing educators' identities as being dynamic and not static. In other words, many factors influence educators' identity development. Alsup (2006), Crumpler and Handsfield (2020), and Jenlink (2014) have discussed the concept of identity formation and its dynamic nature. In addition, they have stressed the importance of positionality and how it influences educator identity.

In my thesis study, I focused on three educators who are tech-savvy and use technology in their teaching. They all taught in the same business school and have won various teaching awards. In addition, they did not receive professional educator training and have 5 to 13 years of teaching experience. Of the three educators, Dr. J had the most experience (i.e., 13 years), compared with 5–6 years of teaching experience for the other two educators. I wondered how having more years of teaching experience affected the multimodal materials that Dr. J developed for her teaching practice compared with the other two educators. How did her multimodal trajectory develop over time and how can it be related to the application of the 3D framework?

I considered these educators' identities, positionality, and teaching trajectories as important factors in my exploration of how their overall identities influenced their decisions to adopt learning technologies. My findings provided supplementary information to further explain the technical, cultural, and critical dimensions in Green's (2012) 3D framework.

Appendices 1–3 provide more information about the educators and their identities, positions, and self-reported teaching philosophies. The portraits of these three educators reminded me of their self- and professional identities, assisting my in-depth analysis of their pedagogical designs later in this study. The demographic information and digital tools described in the educators' portraits help to explain the teaching trajectories discussed in Chapters 4 and 5. This study explores why educators adopt technology in their pedagogical designs in connection with their identity. Different educators may have different reasons and beliefs that affect their decisions about technology adoption. Educators' views of themselves as educators affect their decision-making processes and positions in pedagogical design. In this study, the three educators share similarities such as teaching in the same business school, recognition as good educators by winning awards, and being women aged 30 to 45. There are also key differences,

such as the types of technology used in their teaching, the reasons for their use of technology, and how they plan and teach unit content. This is where each educator's identity helps explain and differentiate their stories in terms of who they are, how they plan, how they teach, and which technology they use, and why. The manner in which their own identities differ from those of the others and how that critically influences their decision-making processes deserves further exploration to better supplement the analytical results generated using the 3D framework.

3. Connecting the Educators' Identities to the 3D Framework

In this thesis study, I explored how educators used various modalities and technologies in their pedagogical design processes. I used the 3D model proposed by Green (2012) as a theoretical framework to comprehensively and explicitly explore how these three educators used learning technologies according to the framework's critical, cultural, and operational dimensions. By developing my understanding of why these educators applied certain pedagogical designs in addition to determining their implicit reasons for their decisions to implement learning technologies, my findings will be more meaningful and impactful. Hence, the construct of identities shaped by figured worlds proposed by Holland et al. (1998) was a useful complement to Green's 3D framework. Therefore, I could obtain a better understanding of educators' internal motivation and how learning technologies drives their decisions to change their digital pedagogies. I could further explore how the case study educators constructed their identities through the operational, cultural, and critical strata in the 3D model. Therefore, Green's (2012) 3D framework helped me to explore how educators adopted different technologies in their teaching practices based on the technical application perspective, their cultural interaction considerations, and their critical decisions about their digital pedagogical designs. Green's (2012) 3D framework was focused on the explicit outputs of educators' implementation of learning technologies. However, I needed an assessment tool to better understand the educators' internal worlds to identify what drives their decisions and how the factors of their internal drive and identity affected their overall pedagogical designs and applications. I found that tool in the research of Holland et al. (1998) and suggestions related to the figured worlds concept and related identity construction.

It is important to understand how educators' identities are formulated and to identify their personal backgrounds, teaching philosophies, and institutional influences to better understand

how the figured worlds at UHK had an external influence on the educators' digital pedagogical approaches.

According to Holland et al. (1998), positionality involves the positional power and influences available to individuals in a given position. For instance, in my thesis study, I interviewed educators who were previous winners of the Faculty Teaching Award, the University Teaching Award, and the Innovative Teaching Award. With these awards, UHK recognised the prestigious work of these educators. As Holland et al. (1998) observed, positionality is the "hereness" and "thereness" (p. 271) related to individuals' power, status, and rank.

Thus, the participating educators in my thesis study all had different academic backgrounds and were all recipients of various teaching awards. As Holland et al. (1998) would say, they were all equipped with certain levels of power, status, and rank. I explored how these educators' positionality can be translated into pedagogical outputs. In other words, I explored how the three educators positioned themselves and how their positioning was reflected and translated in their application of multimodalities. The figured worlds concept provided a way to frame the focal educators' identities and positionality within the same higher education context. That is, I framed how their three distinct digital pedagogies existed and differed within the same university.

As discussed above, the process of identity formation is an important factor in understanding educators' internal cognitive processes in response to their external influences. In this thesis study, although the educators predetermined certain pedagogical designs that they believed would benefit their students' learning, their decisions are subject to external factors, such as university influences, departmental guidelines, and students' feedback. How educators reacted to these considerations and made their corresponding adjustments is a fertile area for further exploration. Gee (2001) elaborated further on the framework of Holland et al. (1998) with his argument that educators' identities could be used as an analytical tool to understand schools and society. Gee (2001) defined educators' identity as a certain "kind of person" in a specific context and proposed the concept of multiple identities connected to a person's "core identity" (p. 99). Gee (2001) also suggested the possibility of changing identities according to individuals' external influences, which led to changes in identity within different contexts. Gee's (2001) approach is coherent with the authorship concept proposed by Holland et al. (1998), which is focused on the process of continuous identity formation.

While many scholars have explained how educators' identities are formulated (Beijaard & Meijer, 2017; Holland et al., 1998; Ruohotie-Lyhty, 2018; Varghese et al., 2005), other scholars have recognised the relationship between identity development and the affordances of the socio-physical environment (Pappa et al., 2017; Ruohotie-Lyhty, 2011). Yet other scholars (Yuan & Mak, 2018) have provided answers to the question of how educators' identities can change within different contexts according to their different external influences.

Beijaard and Meijer (2017) stated that educators' beliefs are central to the formation of their identity, which influences their engagement, commitment, and actions in their teaching. Varghese et al. (2005) suggested that educators' identities are formulated through self-disposition, while external influences are formulated through social interaction. Because the three educators in my case studies teach in the same university, I considered UHK to be their main external influence. Accordingly, the figured worlds at UHK are related to a specific culture that offers resources to support all three educators. Although these educators taught at the same business school at the same university, they are responsible for different subjects. Their adoption of digital pedagogical design varied widely from YouTube videos to online platforms to animated videos to VR. Therefore, the manner in which these educators' different identities enacted such changes provides an interesting area for exploration.

I used all these multimodality, agency, and figured worlds theories to supplement my thesis study based on the operational, cultural, and critical dimensions of the theoretical 3D framework. Ruohotie-Lyhty (2018) suggested using agency to better understand the transformation of identities. When the original identity of educators is challenged by new information generated by different contexts, such as their university, department, or their own teaching subjects, these educators may consider changing or defending their original ideas. Yuan and Mak (2018) also stated that identity transformation might be related to the broader higher education context and its embedded culture and rules. I explored the extent of identity transformation further by analysing the interview transcripts and teaching artefacts in this thesis study.

Various scholars have stressed the complexity of educators' dynamic identity development (Beijaard & Meijer, 2017; Varghese et al., 2005); in addition, the process of change was both personal and professional. Alsup (2006) used negotiation to describe the communication process between educators' personal and professional selves. The process by which educators' self-perception affected their subject teaching and how the required knowledge to teach

different subjects may later require the adjustment of certain practices was very complex. In my thesis study, I used the focal educators' personal and professional identities to complement my explanation for why educators may initially use a particular learning technology and then make adjustments to their pedagogies.

Beijaard and Meijer (2017) observed that “one who is as a person is strongly interwoven with how one works as a professional. Both dimensions together represent one’s educator identity” (p. 177). This understanding of educators’ identity is coherent with the figured worlds concept. In addition, Blommaert (2005) described identities as not being internally produced, but “constructed through different practices” (p. 205), which can be considered as the result of socially conditioned semiotic work.

In my thesis study, these theories for the development of educators’ identities are important in addressing and interpreting why and how educators adopted particular learning technologies in their teaching practices. I pursued this line of inquiry to understand how and which external factors influenced educators’ decision-making and are therefore crucial in the analytical process. All of the focal educators in this thesis study had received various forms of recognition from UHK for the quality and innovation of their teaching practices. How this external recognition influenced the formation of each educator’s identity and thus affected their decisions to adopt various digital tools was explored in depth.

4. Interpreting Multimodality and the Figured Worlds Through the 3D Model

I use the drawing below (Image 4) to illustrate how I interpreted Green’s (2012) 3D model through the lens of multimodality and UHK’s figured worlds. In this thesis study, I aimed to

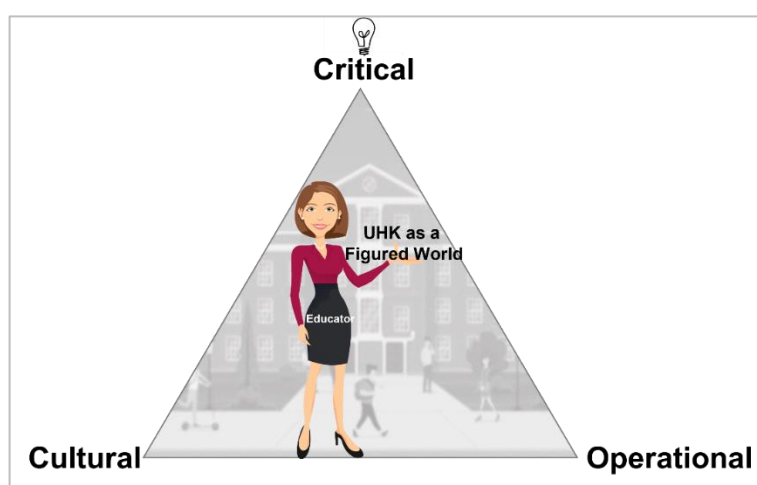


Image 4: A new interpretation of the 3D model (my own drawing)

understand how the three focal business school educators adapted their planning and teaching to digital pedagogies. Any application of digital pedagogies involves the translation of learning texts through different modes of expression. The manner in which the case study educators made their multimodality decisions during their process of adopting learning technologies is related to the critical dimension of Green's (2012) 3D model. In addition, cultural considerations are another important dimension that can contribute to understanding why these three educators made their multimodal decisions. In addition to considering the university's overall policies, resources, and grant support as the figured worlds that socially influenced the studied educators, these educators' identities were also tied to the cultural dimension, which provides a basis for explaining the digital shift from the critical dimension. The outputs of the digital pedagogies (i.e., videos, PowerPoint slides, and VR) are described by the operational dimension (Green, 2012). By analysing these applications, I explored how varying digital approaches could change the nature of teaching pedagogies.

This study explored digital adoption from an educator's lens. I deliberately place the female avatar in Image 4 in the middle of the figure to illustrate the focus of my thesis study.

The triangle in Image 4 is used to represent the three dimensions of the 3D model, which illustrates my holistic approach in this thesis study. I purposely placed the critical dimension above the avatar to indicate the think–act process. The light bulb represents the consideration of multimodality, while the avatar's action is represented through digital means at the bottom right through the operational dimension. In Green's original visual representation, the three strata play out simultaneously without any hierarchical priority. However, my suggested visual representation prioritises the “critical” dimension. Therefore, the light bulb is a symbolic representation of agentive action through the educators' power. The picture of the university behind the avatar is meant to illustrate the socio-cultural factors driving the think–act process. I added text to the avatar's body to represent her identity. These factors consider the cultural dimension in the 3D framework. In this way, my drawing should be considered as an extension of Green's (2012) original 3D model.

E. Chapter Summary

The literature review in this chapter addresses key concepts in my thesis, such as multiliteracies, multimodalities, the 3D model, educator identities, and how multimodality and figured worlds can be used to supplement Green's (2012) 3D model. As the theoretical

framework, this 3D model draws strength from its holistic coverage of its critical, cultural, and operational dimensions. I used the multiliteracy, multimodality, and figured worlds theories to explore and understand the focal educators' use of learning technologies. These theories facilitated an in-depth exploration of the drivers of digital applications and the multimodal and design choices made by the focal educators in their pedagogical planning. This chapter describes the context of UHK, within which the studied educators were situated. I considered UHK as the figured worlds that may exert an external influence on these educators' pedagogical decisions and planning. I also proposed a new visual representation that incorporated all of the components of these three dimensions, educator identities, and figured worlds.

CHAPTER 3: RESEARCH DESIGN AND METHODS

A. Introduction and Overview

In this chapter, I explain my methodological approach, including my methodological considerations, my rationale for using a qualitative research approach, how I recruited the educators, how I collected and analysed the data, and the ethical procedures I performed during the data collection process.

My purpose was to explore why and how three business educators at a university in Hong Kong differed in their adoption of digital pedagogies. I wanted to identify why these educators adopted different technological tools in their pedagogical designs and how they made their decisions. As an educator myself, I was curious to know how other educators kept up with the constantly changing learning technologies, how they applied technological tools in their daily teaching practices, and the factors that drove these changes. All educators work differently; therefore, the technological tools that they adopt in their teaching practices also differ. I explored whether there were any patterns or similarities that I could draw from in this study, which was based on Green's (2012) 3D theoretical framework. The identities of the focal educators and their working environment were crucial. I considered UHK as the educators' figured worlds and their identities helped me to understand why and how certain pedagogical digital designs were adopted. I sought to answer the following questions:

RQ1: In what ways do the three business school educators adapt their planning and teaching to digital pedagogies?

RQ2: How do varying approaches to planning and teaching change the nature and properties of the educators' pedagogies?

RQ3: What multimodal and design choices do the educators make for their teaching, planning, and pedagogic artefacts?

RQ4: Does the 3D framework foster greater awareness of approaches to digital teaching and learning?

B. Philosophical Position

In this thesis study, I used an interpretivist qualitative approach in a multi-case study design. Interpretivist focused on the roles that actors and cultures play in the knowledge formation process. Vygotsky's (1978) socio-cultural theory highlighted the role of social and cultural interactions in the learning process and suggested that individuals develop multiple and varied

subjective meanings from their experiences. Therefore, scholars must address the complexity of people's views instead of narrowing their focus (Creswell, 2018). Higher education business studies include marketing, management, finance, accounting, and information system subjects. Therefore, different educators may have various reasons for using different modes, different multimodal media, and different devices in their teaching practices. In this way, educators' various experiences with learning technologies and students have shaped their instructional design decisions to achieve certain learning goals. Accordingly, the relationships and interactions between these factors are complex and not easy to understand through generalised data.

This interpretivist philosophical position is qualitative in nature and worked best for my design to assess the idiosyncrasies of the three educators. I used the interpretivist perspective in this thesis study because of its ability to help me understand the educators' perspectives (Creswell, 2018). Creswell (2018) also stressed that qualitative research is exploratory in nature and therefore suitable for examining under-researched topics or groups. The use of learning technologies in university business teaching is an under-researched area; therefore, the adoption of a fundamentally exploratory and qualitative approach (Creswell, 2018) was justified in this thesis study. I adopted a multi-case study design using a holistic approach in my exploratory study that focused on three educators, which Creswell (2018) identified as an appropriate research method because it is one of the five major types of qualitative research methods.

Interpretivism is a philosophical approach used to determine when an individual is regarded as an actor in the social world. Weber (1978) posited that the central idea of interpretivism is creating meaning through social interactions. Weber suggested that meanings are not simply made through individuals' direct reactions to their external environment. People think before choosing particular actions; therefore, people tend to attach meaning to their actions. I related this epistemological suggestion to my thesis study, whose core goal was to understand the in-depth meanings of educators' actions.

Hammersley (2013) explained interpretivism as the need to draw upon human capacity using empathy, shared experience, and culture to understand others "from the inside" (p. 26). Hammersley also mentioned the possibility of subjectivity that may be produced during the exploration process. The main reason for this phenomenon is that researchers may achieve an in-depth understanding by drawing upon their own social experiences or explanatory ability

rather than procedural objectivity. Hammersley's suggestion was also consistent with those of other scholars (Orlikowski & Baroudi, 1991; Weber, 1978) with respect to reasons for using the interpretivism approach. Weber (1978) suggested the value of understanding individuals through their actions and elaborating further using an interpretivist approach. In contrast, Orlikowski and Baroudi (1991) built their interpretivist approach on a constructive ontology, in which they described interpretive research as understanding "how members of a social group, through their participation in social processes, enact their particular realities and endow them with meaning, and to show how these meanings, beliefs and intentions of the members help to constitute their actions" (p. 13).

The roles of researchers in studies and how these roles are related to the interpretation process are crucial in interpretivism approaches. In the Introduction chapter, I discuss my own background and my role in this thesis study to provide more transparency and address any subjectivity concerns that could be raised about my use of the interpretivism approach.

Hammersley (2014) proposed some remedies to improve the subjective nature of the interpretivism approach. He suggested that researchers use "intentional explanation" (p. 5) to document their understanding of themselves, their actions, and their world. He pointed out that researchers are the experts in their own worlds. By clearly stating my own teaching philosophy, my beliefs and practices in digital pedagogy can be used to provide an easy point of reference when interpreting the approaches used by the studied educators.

Hammersley (2004) also suggested that the importance of interpretivist epistemology is to emphasise the interpretative role of the interviewer, who attempts to explain their findings through the construction of a holistic picture of the field. He suggested that subjectivity is unavoidable in the interpretation process, but researchers are advised to suspend their own assumptions and investigate the actions and characteristics of their study objects. The importance of interpretivism is to draw upon a person's own experiences to understand and interpret other people's experiences.

I examined how educators adopted learning technologies as part of their pedagogical design when teaching business subjects. These interpretations can be made through understanding educators' actions, such as the applications of certain technological tools and why the selection of certain tools and meanings represent an attempt to draw from their actions.

Schutz (1970) suggested that an interpretive researcher should “not [become] involved in the observed situation, which is to him not of practical but merely of cognitive interest” (p. 275). As an educator working in the same business school as the study educators, it was difficult to simply isolate my practical position, the role I play at the school, and my various assumptions during the interpretation process. Therefore, I followed Orlikowski and Baroudi’s (1991) suggestion to include more engagement in the interpretation process because “the researcher can never assume a value-neutral stance” (p. 15). This perspective fit well with my purposes in this thesis study.

I was fully aware of my own subjectivity in the research process because I know the three studied educators personally and we work in the same university context. I have also adopted many multimodal means similar to those adopted by the three educators. Accordingly, I understand that my pedagogical beliefs, values, and practices have shaped my interpretations of my research findings. Nevertheless, my subjectivity enhanced my intention to obtain a deeper understanding of how educators who have adopted digital pedagogical means similar to mine planned for and thought about digital forms of teaching university-level business subjects. This interpretation process was not meant to generalise but to obtain an in-depth understanding through interpretation of the results, which unavoidably implicated my subjective meaning, understanding, and representation. I provide my own portrait (my profile is provided in Appendix 4) together with those of the three study educators (Appendix 1 contains Prof. M’s profile, Appendix 2 contains Dr. E’s profile and Appendix 3 contains Dr. J’s profile) to help readers understand my own interpretative lens. They may be able to determine its sufficiency for themselves using their own interpretive lenses.

In suspending their own biases to learn more about the actions and characteristics of the investigated study objects (Hammersley, 2004), Ledin and Machin (2018) used a populated visual analytical tool to promote their own reflexivity. I also used this tool to help me interpret the artefacts. I adopted Green’s (2012) 3D model to extend my interpretation process and capture a more holistic perspective. To obtain different perspectives on the three educators’ pedagogies, I also conducted student interviews to understand and further explain these educators’ various digital decisions.

C. Research Context

I considered UHK as the figured worlds in this study. The figured worlds concept helped me to situate the case study educators in relation to UHK's work culture, practices, assumptions, initiatives, and overall priorities. I explored how the participating educators operationalised their figured worlds through their pedagogical designs.

As discussed in Chapter 1, all of the case study educators taught business-related subjects in the business school at UHK, which is a government-funded research university that provides numerous grants to encourage digitalisation at the teaching and learning levels. It is important to understand the specific cultural environment offered to the three educators at UHK to identify how the educators made their digital pedagogy decisions based on the available resources. UHK has its own LMS, which hosts several platforms and related digital tools to support teaching and learning, such as Panopto, Camtasia, Gradescope, Blackboard Collaborate Ultra, Microsoft Teams, and Zoom. In addition to offering the same technological tools to all educators, UHK has equipped its classrooms with Internet access and all types of audio-visual support to facilitate both face-to-face and online teaching modes. UHK also offers various grants and an information technology (IT) centre to support its educators to develop their own digital teaching materials. In Chapter 4, I provide a detailed explanation of the various digital means that were adopted by the educators, knowing that they work in the same UHK context that I do. In Chapter 5, I discuss how these educators negotiated their identities within the same UHK context and made different critical decisions to adopt digital means for their own teaching using several types of support from UHK.

D. Research Design

1. Explaining the Case Approach

In an interpretive qualitative approach, I employed a case study design in this thesis study using the cases of three educators.

Dyson and Genishi (2005) observed that “the ways people represent and interact about experiences, depend on more than a shared repertoire for meaning making” (p. 5). They pointed out the importance of considering context in a case because it is the physical setting of people's actions. Case studies provide a unique stage for researchers to have “the luxury of looking through her own lens” (Dyson & Genishi, 2005, p. 38). When researchers begin their case studies, they may not have a clear understanding of their research plan. Therefore, Dyson and

Genishi (2005) recommended making sense of time, spaces, and people based on their social activities as an important element of case studies. They suggested ways that researchers could locate themselves within a case, what roles they should take, how they should negotiate these roles, and how to make these case studies matter. I explored the three educators' decision-making processes in adopting particular learning technologies in their pedagogical designs. As an educator and colleague of these educators, my own reflexivity played a role in my thesis research process.

The focal educators' unique ability to master and adopt learning technologies in their teaching practices was shown in the recognition of their teaching excellence with university education awards. Therefore, the number of qualified educators for my case studies was limited and as Yin (2003) has noted, these cases were unique and critical.

In this research, I did not generalise the reasons for the use of learning technologies; instead, I conducted an in-depth exploration of a specific group of educators teaching university-level business subjects. Yin (2018) defined analytic generalisation as aiming to expand and generalise theories while further understanding the "how" and "why" (p. 38) questions originally posed in case studies. Yin (2018) stressed the importance of "bounding the case" (p. 31) to ensure that its items were clearly identified and clarified at the beginning of the research stage. I carefully selected the sample in this thesis study based on three main criteria: (1) the selected educators were active members of the UHK business school and championed technology-assisted teaching practices; (2) the educators had received university teaching excellence awards; and (3) the educators taught representative business courses, such as marketing, management, and economics. All of the educators had at least 5 years of teaching experience. I selected these tech-savvy and experienced educators mainly to ensure that the sampled educators had rich information to share about "why" and "how" they adopted learning technologies in their teaching practices. Each case study featured interviews with an educator, a course identified by the educator to demonstrate her technological applications, and artefacts from their course. I also intended to interview the educators' students about the effectiveness of those artefacts, but I was unable to find students of every educator (I was unable to find students taught by Prof. M.). Students were therefore asked about their perception of the digital approaches used in their courses.

I examined these cases to explain these three educators' practices and experiences using Green's 3D framework (Green & Beavis, 2012) and its operational, cultural, and critical

dimensions. Yin (2018) suggested that the choice of research method depends largely on the research questions. He explained that “the more that your questions seek to explain some contemporary circumstance (e.g., ‘how’ or ‘why’ some social phenomenon works), the more that case study research will be relevant” (Yin, 2018, p. 4). Yin (2018) also pointed out that the adaptation of case study designs is to “investigate a contemporary phenomenon (the ‘case’) in depth and within its real-world context” (p. 15).

A qualitative method that allows an in-depth exploration and explanation of educators’ real-world teaching practices was necessary for this study. Therefore, I found Yin’s (2018) multi-case design to be highly relevant and appropriate. How the studied educators adopted learning technologies similarly or differently in their teaching practices could therefore be further interpreted and described through a multi-case study design.

2. Question Design

I followed Seidman’s (2019) suggestion to develop questions that could help me understand the educators’ experiences and the meaning they derived from their experiences. I developed an initial set of questions for pilot testing and used questions related to each 3D dimension to formulate the lead-off questions and anticipated follow-up questions (see Appendix 7). I formulated questions based on the operational, cultural, and critical dimensions of the 3D model. I used semi-structured interviews based on a social constructivist paradigm because they allowed my conversation with the educators to flow naturally. Waller et al. (2016) suggested using an interview guide that listed all of the questions by theme; they also regarded semi-structured interviews as a guided conversation.

I used Green and Beavis’s (2012) 3D framework as an analytical tool to understand how educators technically transformed traditional texts into multimedia teaching materials, the cultural considerations involved during the pedagogical design process, and how critically the adaptation of multimodality addressed the learning needs of institutions, educators, and students.

I used Green’s 3D framework to better structure the survey questions and collect appropriate data (survey questions are provided in Appendix 7). I formulated the survey questions based on the operational, cultural, and critical dimensions in the 3D framework to help answer the main research questions posed above.

I conducted a pilot interview with an educator at the UHK business school, which was designed to test and reflect on both the practical and conceptual designs of my interview questions. I timed the pilot process and analysed the interview results to explore the cohesiveness of my intended research purposes. I noticed that I spent too much time exploring the multimodal means and that I tended to provide my own answers because of my own familiarity with the UHK context and the students' learning styles and capabilities. I found that the sequence of my questions, which I planned to ask in the "what, how, and why" order, was unrealistic, because the educators tended to provide answers in their own order. Following the results of the pilot interview, I finalised the interview questions (Appendix 8) for use in my thesis study. In this way, the pilot interview was valuable because it made me highly aware of the need to suppress my own assumptions during the interview process. Therefore, I designed the final questions to guide the flow of my interviews. I did not set the order of the questions; instead, I focused on listening to the educators' answers and asked immediate follow-up questions to understand "why" the educators made their pedagogical decisions.

3. Educator and Selection Procedures

In this section, I explained how I identified the three case study educators in my thesis study. Creswell (2018) suggests that multi-case studies should include at least four to five cases, while Yin (2018) recommends six to ten cases. However, because this study explores how business studies educators design and plan their digital pedagogies, the sampling selection criteria were crucial, as I needed to identify teachers with relevant teaching experience in business subjects and digital adoption experience. Teachers at the UHK business school met my selection criteria because UHK is committed to innovative digital pedagogical design, and actively recognises teachers' efforts in this area via teaching awards and financial support. Using the unique and critical selection criteria listed below, I was able to recruit three business educators from the UHK business school (five educators were approached, and two declined to participate).

- They taught a specific business subject at a university-level business school
- They were active members of the business school and championed technology-assisted teaching practices;
- They had at least 2 years of teaching experience at the business school
- They had received teaching and learning awards from the university.

The three educators in my case studies taught different business subjects, such as marketing, management, and investment, to senior-year undergraduate students. The three educators had

more than 5 years of teaching experience and I had identified them as tech-savvy educators who had either received a university or faculty teaching award or played a role in pioneering the adoption of technology in teaching. The three educators who met the above selection criteria happened to be all female; their shared gender was not predetermined.

E. Data Collection

1. Zoom Interviews

In July 2020, I sent recruitment emails to five UHK faculty members, who taught finance, marketing, management, accounting, information systems, and economics at UHK. I sent a follow-up email in August 2020. Three educators agreed to participate.

I then sent emails to all participating educators to obtain their consent to participate in my research process. I sent a consent form (Appendix 5) to the educators who agreed to participate. I received confirmations with signed consent letters (see Appendix 10) from the three educators before the interviews. I conducted individual Zoom interviews with the educators, which lasted 45 to 90 minutes and were recorded with their consent. I did not conduct face-to-face interviews because of the COVID-19 pandemic.

I sent the interview questions (see Appendix 8) to all of the educators before their individual Zoom sessions. I prepared PowerPoint slides and displayed the questions on a shared Zoom screen during the interviews. I based the interview questions on the three dimensions proposed by Green (2012) and used identical interview formats and questions with all educators. I used a prompt format to ask questions and allow the educators to share their teaching experiences without interruption.

Following the discussions that took place throughout the interview process, I identified the required materials for further analysis and requested that the educators consent to provide these materials. The three educators demonstrated different preferences in the use of multimodality in their teaching practices. Therefore, I requested that they share their PowerPoint samples, GoAnimate videos, and animated videos, as applicable, immediately after each interview session.

I transcribed and coded the audio recordings of the Zoom sessions using NVivo 12. I created three main categories: operational, cultural and critical. I then added different sub-themes to

each category. I identified 130 key words from the transcriptions and categorised them, but I realised that the key words and categories were too simplistic and would not enable analysis of sufficient depth. I therefore abandoned the NVivo codes and relied on my own interpretation and self-reflexivity. I explain my role and reflexivity in the study in Chapter 1.

I conducted follow-up interviews with Drs J and E, who had extensive course artefacts, to understand not only the technical production of their videos but also how the storytelling approach used by Dr. E in her video-making process changed her teaching pedagogy. I also conducted follow-up interviews with these two educators to better understand how their pedagogical planning and designs were impacted by the COVID-19 pandemic. Prof. M resigned during the pandemic period, and I lost contact with her and was unable to conduct any follow up interview.

2. Teaching Artefacts

I asked all of the educators to provide the digital materials they used in class for analyses post-interview. I identified these digital artefacts and obtained permission to use these materials during the interviews. The educators emailed me the agreed-upon artefacts after completing their interviews.

Although Prof. M and Dr. E edited their digital artefacts in advance and sent me a portion of their teaching materials for analysis, Dr. J provided full access to the links for the three videos that she produced using GoAnimate.

A 16-page edited version of the PowerPoint slides provided by Prof. M comprised only part of the teaching materials for her marketing management course. These PowerPoint slides illustrated how she taught the concept of advertising and consists of bullet points, images, and videos with embedded links. Prof. M also gave me access to all of the slides' pre-set functions, including links to their embedded videos, the slide transitions, and the animation timelines.

Dr. J provided two animated videos (9:55 and 4:43 minutes) that she used in her organisational behaviour class to replace a text-based case study. She also gave me access to an animated video (10:47 minutes) that she used to teach the concept of organisational culture. Dr. J used GoAnimate to produce all three videos, which consist of colourful animated characters, different background settings, computer-generated voice-over effects, and background music. Dr. J taught herself to use GoAnimate and she was the videos' sole producer.

Dr. E used an animated video for her economics class. She produced a cartoon animation with the assistance of the UHK technical support team. Dr. E developed her own script and video storyboards, and the UHK technical team assisted her with the video production, voice-over, and background music. Dr. E edited her video and gave me a 1:45-minute excerpt that covered the concept of agglomeration economies, which is taught in her class.

3. Student Interviews

To understand how their students perceived the educators' adoption of digital artefacts, I invited three students to be interviewed. Two responded and answered my questions (see Appendix 7) either through Zoom sessions or in writing. I designed most of the interview questions to understand the students' perceptions of their educators' different approaches to digital applications. I also explored the manner in which the students perceived the effectiveness of the various pedagogical designs through the online platform and face-to-face instruction. My goal in this part of the study was to obtain supplementary information related to learning during the COVID-19 pandemic. The interviewed students were business majors and had been taught by Dr. J and Dr. E, but not by Prof. M. Thus, rather than asking the students to comment on their teachers, I asked them to comment on their general perception of digital teaching methods, as they had experienced PowerPoint slides, videos and virtual reality in their business courses. I received their consent prior to interview. My role as educator may have affected the interview process and the students' responses; therefore, I offered the students different interview modes. One female student and one male student from various cultural backgrounds (mainland China and Hong Kong) agreed to participate in the interviews. The female student chose to be interviewed over Zoom, while the male student wanted to reply in writing.

F. Data Analysis

I include the educators' profiles here (see Appendices 1, 2, and 3) as background information to describe their teaching subjects, teaching philosophies, and the multimodalities that they adopted in their classes for easy comparison and further analysis. I also produced my own profile (Appendix 4) in the interests of reflexivity with the goal of providing a reference point when interpreting the educators' cases.

The interview audio recordings were transcribed and codes were generated based on their operational, cultural, and critical dimensions. I generated 130 codes from the transcripts of the

three case study educators and inputted them into NVivo12. I originally planned to analyse the a priori codes in NVivo12 and interpret the data based on the identified codes. In the interpretation process, however, I found the codes were too generalised and simple. The rigidity of these codes did not help me in my interpretation of the educators' in-depth meaning. My original idea to use the three big cultural, operational and critical categories based on Green's 3D model already functioned well in my process of data interpretation. I abandoned the use of NVivo12 codes and depended on my own interpretations and relied more on my reflexivity.

I strengthened a section in Chapter 1 to more clearly discuss the role that I played in my thesis study and address the possibility of subjectivity through my reflexivity. I developed four personas (Appendices 1, 2, 3, and 4), which included the profiles of the three case study educators and my own to provide the reader with a clear picture of who I am. I aimed to use these personas as "intentional explanations" to help readers of my thesis to understand my interpretive lens and determine its sufficiency for themselves.

I clearly state my philosophical position at the beginning of this chapter to explain my interpretivist approach in this thesis study. I was fully aware of my possible subjectivity and took the necessary steps to improve it. I used Machin's visual analysis tool (Ledin & Machin, 2018; Machin, 2007) to help me in my interpretation of the course artefacts.

G. Considered Ethical Issues

Yin (2018) pointed out that research should be conducted ethically without any preceding conditions. He further stressed that researchers should try to avoid potential bias, use contradictory findings to test for tolerance, and report their findings to critical colleagues. All of the ethical factors relating to selecting the educators, drafting the interview questions, treating sensitive data, and interpreting the data were considered (Williman, 2016). Waller et al. (2016) also pointed out that it is important to obtain consent when collecting observational data. My case studies involved sensitive data and educators' teaching observations, practices, and learners, I needed to consider all the above issues before implementing the design, data collection, and interpretation processes.

I began the data collection process after I obtained the proper ethical clearance. The University of Bristol approved the data collection and the three educators and two students involved were fully informed of my purpose in data collection. Furthermore, I clearly explained the

withdrawal options to the educators in their signed consent forms and at the start of the interviews.

My own bias as a colleague of the case study subjects was an issue that I needed to address during the data interpretation process. In my profile, I have included my digital adoption practices and clearly explained my pedagogical beliefs to lay the foundation for my interpretation of these case studies. I worked in the same department as two of the educators; therefore, I exercised great sensitivity when interviewing my colleagues by suspending my own judgements and opinions. I also executed the data analysis process with great sensitivity.

As discussed earlier in this chapter, when confronting the possible subjectivity of my interpretive role in this study, I did not take a completely value-neutral stand. I followed the suggestions of Marshall et al. (2022), who stressed the importance of credibility and trustworthiness in qualitative studies. They pointed out that researchers should ethically engage their case study educators during the question design, data collection, and interpretation stages. Recognising my subjective role in interpreting the data, I openly addressed my positionality by using a visual portrait (see Appendix 4).

In the above discussion of question design, I describe my efforts to increase the credibility and transparency of my study by exercising high sensitivity to designing the questions, including making revisions after the pilot interviews and being aware of the need to avoid asking leading questions and making judgements during the interview process. I minimised my biases throughout this thesis study by providing portraits of the educators and myself to help my readers to understand my interpretation through my critical lens and thus determine their own interpretation. I selected these three educators based on the selection criteria discussed above instead of my personal relationships with them. I officially invited all of the educators by email and obtained their signed consents to ensure that their interviews and artefacts were properly protected and credited (Creswell, 2018).

My knowledge of the educators in this study was not an obstacle but an advantage because I did not need to spend time learning about the university context in which they were situated, their practices, and the resources available to them. I was able to identify the differences in their digital practices and the different extents of their resource use by comparing their digital adoption with my own. Instead of trying to avoid my own subjective interpretations, I used the scholarly 3D model from Green (2012) as discussed in Chapter 2 to strengthen my

investigation. I also used Ledin and Machin's (2018) visual analysis tool to assist my interpretation of the teaching artefacts.

CHAPTER 4: FEATURED EDUCATORS' CASES

In this chapter, I document the teaching practices of the three educators in my case studies using courses that they identified as examples of their use of technological applications for teaching and learning. UHK requires all educators to fulfil their teaching load (i.e., at least 2–4 courses per semester). To ensure that the study remained focused, I requested that each educator identify only one course for the purpose of in-depth research into their technological applications. The courses that the educators identified did not duplicate their contents or disciplines. All courses were categorised as business courses under the business school. The students who took courses from these educators were identified for further interviews, which were transcribed for the purpose of comparing the case studies.

This chapter also provides background information about UHK and the business school in which the educators teach. The figured worlds at UHK exerted a cultural and social influence on the educators' pedagogical decisions. This chapter also includes personas of the three educators (see Appendices 1, 2, and 3), including their basic information, teaching philosophies, teaching areas, and the multimodalities used in their classes. The main goal is to provide readers with a reference point for interpreting the educators' cases and helping them to understand my interpretive lens.

In this chapter, I document the various ways that the three educators adapted their planning and teaching practices to digital pedagogies using different technological tools. I also demonstrate how the figured worlds at UHK can be connected to Green's 3D model and how this framework could be used as a supplementary concept to enhance interpretation of the three educators' decision-making processes and their planning and pedagogical approaches. I also show how the operational, cultural, and critical dimensions of the 3D model were played out in the educators' pedagogical designs.

A. Figured Worlds at UHK

In this section, I explain the working environment at the UHK business school where all three educators were situated. The UHK provided free digital teaching and LMSs such as Blackboard, Microsoft Office 365, Panopto, Camtasia, VeriGuide, Gradescope, uReply, Qualtrics, and Zoom. All teaching classrooms were equipped with high-quality audio-visual systems suitable for both face-to-face and online teaching practices. UHK also offered excellent technical support to educators and students alike. In particular, the technology

department provided free consultations and offered grants to encourage educators to produce their own digital teaching materials. In this way, UHK educators are provided full autonomy to use and adopt any digital tools that suit their teaching practices. UHK facilities include a Chroma Key Studio, a recording studio, and a multi-purpose area for post-production, which are all available for educators.

UHK is a research university actively promoting innovative teaching practices by offering teaching grants focused on courseware development to encourage educators to develop their own courseware. All educators are invited to submit their proposals to the committee, which has maximum annual grant caps of approximately US\$13,000 to US\$26,000. These grants have encouraged educators to produce high-quality micro-module courseware. In addition, the grants are designed to promote educators to engage in pedagogy research on e-learning and adopt innovative pedagogies. One of the UHK grant requirements is to produce a mid-term progress report and a final report to communicate the final design results. The grant recipients are invited to participate in the annual innovative teaching expo, where they can share their experiences. All three educators in this thesis study were recipients of various grants in recent years.

The UHK business school has its own teaching and learning committees, which organise regular workshops related to innovation and teaching pedagogy. During the COVID-19 pandemic, the UHK held additional workshops for business school educators to discuss improvements to teaching practices related to diverse topics, such as online teaching, Zoom, and the use of new technological platforms. Teaching awards are given to outstanding educators annually. As a figured world, the UHK has provided financial support and awards to enable all its educators to participate in its innovative pedagogical design culture. Educators with or without digital competencies can develop their own digital materials with various levels of financial and technical support at UHK.

The concept of positionality (Holland et al., 1998) suggests that educators can choose to accept, reject, or negotiate relevant offers. All three of the educators in this thesis study used the technological supports provided by UHK to varying degrees. In this chapter, I discuss in detail how these three educators' positionalities were reflected through the figured worlds at UHK and how their positionalities were translated into different digital pedagogical outputs.

B. Technological Adoptions by the Three Educators

Prof. M (Appendix 1) mainly used PowerPoint slides to teach her marketing course to first-year undergraduate students. She saw PowerPoint slides as a tool to guide the flow of her classroom teaching practice. She primarily used bullet points in her PowerPoint presentations and occasionally added graphics and videos to explain certain concepts. She conveyed examples and stories verbally in class and these examples were purposely omitted from the PowerPoint slides because Prof. M believed that verbal examples were more efficient than written texts. She considered that university studies should increase her students' critical thinking skills through questions and answers in the classroom, and not by reading and taking notes from PowerPoint presentations. Prof. M is a young scholar who won the UHK's University Teaching Award in 2018.

Dr. E (Appendix 2) believed that videos and VR were effective learning tools for explaining abstract business concepts to her students. She applied for a university grant to support her production of the videos and VR teaching materials and has also received a teaching award that recognised her use of innovative pedagogical tools in her teaching practice. Dr. E is a young educator who emphasised helping her students understand abstract concepts. Before the interview, Dr. E successfully applied for a grant to produce a third set of VR teaching materials for her class, mainly because of the excellent student and industry feedback she had received from earlier VR teaching materials.

Dr. J (Appendix 3) believed that different digital tools can could different teaching functions. She used animation/storytelling to help her students understand organisational behaviour. Dr. J created stories to explain both strategies and management concepts because she was a huge fan of movies and loved to create educational stories. She was enthusiastic about trying out new technological tools and her teaching tools are constantly being updated and her teaching materials modified to suit her students' learning pace and needs. Dr. J was always trying different technological tools, which she paid for out of her own pocket. With 13 years of teaching experience, Dr. J regularly presented her pedagogical designs at the university's annual teaching and learning expo and has received awards for her innovative teaching practices. Dr. J was also an active member of the business school's teaching and learning task force, which drives overall teaching excellence amongst all business school faculty members.

Although these three educators had various levels of digital competency, they all applied for UHK grants to support their development of digital teaching materials. While Dr. J was technically self-sufficient and did not need to seek technical support from the university's IT centre, she used the grants to purchase software for her own video production. Prof. M and Dr. E used the centre's technical support. Prof. M and Dr. E used the centre's technical support. Although the application of digital teaching materials may not have a direct link to teaching awards, these educators have successfully won awards for their teaching practices and UHK has recognised them for their work.

In the next section, I discuss in detail how these three educators, who had different teaching philosophies, chose to produce their teaching materials differently under the same university at UHK. First, I list the technologies applied by the educators. Next, I discuss how each educator made their technological decisions in the UHK context and how they operationalised the 3D model.

C. Prof. M's Teaching Experience—Marketing Course

1. Prof. M's Profile

Prof. M was a young research-track educator with 5 years of teaching experience. Her research interests included consumer experiences with high-tech products and services, digital marketing (e.g., smartphones, video games, and online social networks), branding, econometric modelling, and empirical industrial organisation. She primarily taught marketing management to sophomores and new product management to seniors. Prof. M won the 2018 UHK University Education Award, which recognises an educator's commitment to promoting teaching excellence and their outstanding teaching performance.

The figured worlds at UHK have influenced Prof. M's level of recognition. In particular, winning the UHK Education Award gave Prof. M a reputation as an exemplary educator. She was also featured in various university-sponsored video promotions regarding best teaching practices during the COVID-19 pandemic.

2. Teaching Philosophy

In a 2018 UHK TV interview, Prof. M revealed that she used a challenge-based teaching method based on three “I” words: “involve,” “investigate,” and “innovate.” In the interview, she stressed her teaching philosophy of including students’ inputs in the process and allowing her students to innovate, albeit with proper coaching.

In my interview with Prof. M for this study, she indicated that she mainly used PowerPoint slides to teach her marketing management course. She also used Blackboard, an LMS provided by UHK, to post all of her teaching materials. She saw PowerPoint slides as a tool to guide her teaching flow in the classroom. She primarily used bullet points in her PowerPoint presentations and occasionally added graphics and videos to clarify her explanations about certain concepts. She also presented examples and stories verbally in her class, and they were intentionally omitted from the PowerPoint slides. Prof. M believed that verbal examples were more efficient than written texts and considered that university learning should extend students’ critical thinking skills through asking questions and receiving answers in the classroom instead of reading and taking notes from PowerPoint presentations.

Prof. M used group projects to assess her students’ abilities related to team collaboration and applying the taught concepts. She asked questions after oral presentations to check her students’ understanding and she also checked their contribution level in their group projects through question and answer sessions. Prof. M has established her own ways to motivate her students to participate in their group projects. She accorded high importance to group presentations when assessing her students’ abilities.

Prof. M usually asked her students to use PowerPoint presentations to present their group projects and required her students to meet her presentation criteria. She believed that PowerPoint presentations should contain mainly bullet points and few words. She requested her students to verbally elaborate on their ideas based on the bullet points included in their PowerPoint slides. Prof. M stressed that she did not want her students to simply read the text on their PowerPoint slides. In this way, Prof. M appeared to adopt a dominating role when dealing with how students should use PowerPoint effectively. Prof. M held strong opinions about how PowerPoint should be used, such as including few words and stressing the importance of students’ verbal explanations of the meaning of their ideas. Although Prof. M

claimed to use PowerPoint to guide her teaching flow, she implicitly used it to control her teaching flow, her students' presentations, team member involvement, and time.

When I asked how Prof. M provided out-of-class support, she indicated that she takes a supporting role compared with her active role in the classroom, where she had a greater urge to control the flow of information. She allowed her students to work on their own without much interruption. However, she purposely asked her quieter students to answer questions.

Prof. M seemed unexcited about using technological devices in the classroom. Based on her comments, it is not difficult to notice that she perceived such devices as being distracting and felt that she needed to capture her students' attention. She believed that her students used their mobile devices to engage in other activities than learning. Therefore, she did not use any mobile devices for class activities. However, she intentionally omitted answers from her PowerPoint slides because by doing so, she believed that she could keep her students' attention on her verbal explanations.

Prof. M held strong beliefs about her role as an educator who must ensure that her students learn in her classes. Her comments during the interview highlighted how she technically modified her PowerPoint slides to ensure student learning. Her identity as an educator with her own teaching philosophy provided an important insight into explaining why she needed to control her teaching flow, why she used animations to trigger her students' thinking processes, and how she asked questions to ensure their active participation in group projects.

During the COVID-19 pandemic lockdowns, Prof. M continued to use PowerPoint slides as her main teaching tool. However, she incorporated platforms like WhatsApp, Chat Box, and Zoom's polling functions to rearrange her teaching delivery for online teaching. In a video interview, she mentioned that online teaching during the pandemic period was not about the technical side, but was more about how she rearranged her lectures and how she modified the way she asked her students questions using different online platforms. Her philosophy of helping students learn through questions seems to have been consistently applied in both face-to-face and online teaching modes.

3. Understanding Multimodality Using the 3D Framework—Prof. M

Prof. M mainly used PowerPoint slides in her teaching practice. She obtained YouTube videos and inserted links to her PowerPoint presentations. She took advantage of the sharing features of these video links to provide her students with the flexibility to view the learning content outside the classroom. Kress (2004) suggested that different modes carry different meaning-making functions; hence, Prof. M mixed her multimodal use of learning technologies through bullet points and videos with links that provide students with access outside the classroom. Considering her students' preferences in using different multimodal media, Prof. M wisely adjusted her teaching materials to allow her students to learn in another environment, not necessarily during class time.

I interpreted Prof. M's teaching using Green's 3D framework; hence, her use of PowerPoint slides as a tool for teaching was operational because it helped her to control the timing of her in-class content delivery. However, her PowerPoint slides did not simply function as an operational tool to control her teaching time, she intentionally used PowerPoint's animation function to facilitate her students' thinking and discussions. For her, the ability to use PowerPoint was in itself a critical action. In the following comments, she demonstrated how she used PowerPoint slides, including multimodal means (i.e., texts, images, and audio) to serve the operational function of controlling time. She also highlighted her intention to use transition times to capture her students' attention and facilitate further thinking. Green (2012) used the term "critical dimension" to explain this phenomenon.

[W]hen I said the PowerPoint is easier for me to control the flow, it's because I can show them those things step by step. The students can follow and then they would not just obtain the answers without any critical thinking. So, I mean, I usually use the PowerPoint slides to control my teaching flow and the students also use the PowerPoint slides to follow me and then try to think before they receive the answers. (T1)

The PowerPoint slides in Images 5 illustrated how Prof. M shifted from the operational dimension to the critical dimension by manipulating the various animation functions of her

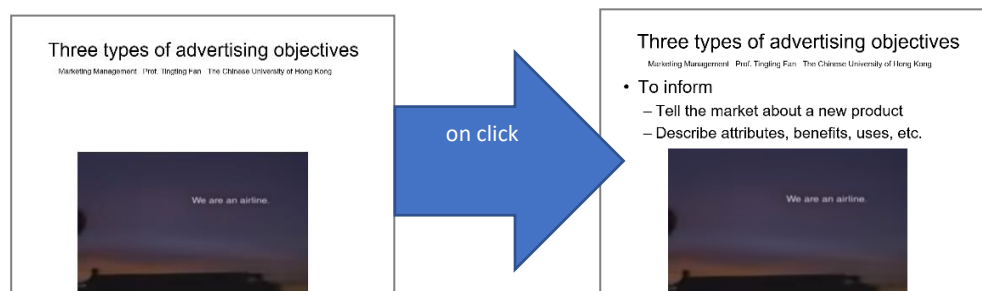


Image 5: Prof. M's PowerPoint Sample 1

PowerPoint slides. She usually showed the video depicted in image on the left and asked her students to provide answers before clicking the mouse to show the answers in image on the right. Prof. M's intention not to show the answers immediately was critical in the sense that she allowed her students time and space for deep thinking and facilitated classroom discussions. The operational functions embedded in the PowerPoint slides transformed the sequential presence of text and her students' thinking could be guided by her mouse clicks.

As the teaching tool adopted by Prof. M, PowerPoint performed an operational function by controlling the pace of her content delivery in addition to facilitating classroom discussions and students' thinking. Prof. M's decisions about which video was more appropriate to illustrate a teachable concept was a cultural issue. Knowing where to embed the video, when to play the embedded video, and when to display the answers reflected Prof. M's critical decisions. Her critical planning certainly played a significant role in her adoption of PowerPoint. The use of texts, videos, and PowerPoint's transition effects to explain a concept is an operational issue. However, when Prof. M intentionally played the embedded video first and facilitated discussions before she showed her students the answers, this process reflected her critical decision-making and planning. In addition, Prof. M's critical planning was executed by manipulating the affordances of PowerPoint's transition effects. Although the operational, cultural, and critical dimensions played out simultaneously and interdependently, Prof. M's dominant role in her decision-making process reflected the critical dimension. She made decisions about her teaching flow by manipulating the PowerPoint transitions, and she enriched her teaching contents through including appropriately embedded YouTube videos in her PowerPoint slides.

4. Connecting Prof. M's Identity to the Critical Dimension

Prof. M saw her role as an educator as one of teaching responsibility. She held strong beliefs about UHK's educational mission and her identity was built around her reputation as a good educator. She has developed her own philosophy about how good educators should perform by inspiring her students by sharing knowledge and then leaving room for her students to ask questions without giving all of the answers. Therefore, Prof. M's identity was very educator oriented. When I asked about her teaching style, she mentioned some predetermined teaching philosophies:

I think it is more important to inspire students, give them my points, you know, give them my reasoning, my arguments, and then inspire them to challenge me. (T1)

Prof. M's PowerPoint slide designs were aligned with her beliefs about how to be an effective educator. She used bullet points, transitions, and animation effects in her PowerPoint slides to guide her students' thought processes before giving them all the answers.

Prof. M had specific goals that she wanted her students to achieve. She dominated the teaching flow and used technological tools to guide both her teaching flow and her students' learning pace. She fulfilled her strong responsibility to help her students learn by carefully designing her lesson plans using PowerPoint slides, videos, and group projects. She stressed the importance of students' self-reflection and critical thinking skills.

She wanted the best for her students. Therefore, she expected them to follow her teaching flow and felt responsible for directing her students' learning both in class and through out-of-class activities. Prof. M critically used various multimodal means to facilitate her students' learning in her pedagogical planning.

I turned to the theory of positionality to understand how Prof. M negotiated her identity through PowerPoint. Holland et al. (1998) defined positionality as the power and influence that a position offers to a person. Although she is still young, Prof. M has already won the prestigious University Teaching Award. Prof. M then negotiated her identity through manipulating PowerPoint slides to achieve her internal goal: that is, helping her students to succeed. The figured worlds at UHK have strengthened Prof. M's positional identity through award recognition. However, the diversified technological supports offered by UHK did not appear to have affected Prof. M's pedagogical planning and design because her digital pedagogies are minimal and she has mainly adopted PowerPoint slides as a teaching tool.

Prof. M graduated from a renowned university in China and earned her PhD in the US. She has won many awards related to her research and teaching. Her identity as a successful young Chinese scholar led to her educator-centred approach. In Hong Kong, she continued to pursue her mission to teach. In her teaching practice, Prof. M has helped her students to follow her teaching flow and develop their critical thinking skills in their learning process. Prof. M used PowerPoint in her classes as a tool whose operational function is to help her teach. Based on her interview (excerpted above) and her PowerPoint slides, she demonstrated a strong belief in

using PowerPoint and embedded videos as technological tools for time control, for content delivery, and to facilitate in-class discussions.

As a very confident young scholar, Prof. M based her identity on her belief that her students could learn more easily if she applied learning technologies only minimally. I used Green's 3D framework to interpret Prof. M's pedagogical practices and observed that she acted very critically in exercising her power to decide what her students needed to learn about the subject of marketing. In addition, I found that she considered that her students learned best when she controlled the flow of her teaching using PowerPoint slides. Therefore, Prof. M's self-identity was strongly correlated with her critical decision to minimise the use of learning technologies in this case study.

This case study demonstrated how Prof. M's strong teaching philosophies were reflected through her digital pedagogical designs, which were related to the critical dimension in the 3D model (Green, 2012). In addition, this case illustrated how the figured worlds at UHK did not impact Prof. M's digital adoption decisions but had a greater influence on her on positionality identity recognition.

D. Dr. E's Teaching Experience—Economics Course

1. Dr. E's Profile

As a young educator with 6 years of teaching experience, Dr. E spent 3 years working as researcher in the real estate industry before joining the UHK business school. Dr. E's research interests included real estate economics, commercial real estate, asset pricing, behavioural economics, and land supply urban renewal. She primarily taught real estate economics, shopping mall investments, and real estate valuation to junior and senior students.

Since 2018, Dr. E has received a few Faculty Teaching Excellence Awards, which honours faculty members for their excellent performance and achievement within the business school.

2. Teaching Philosophy

Dr. E actively applied for university micro-module grants and devoted her time to developing videos for her classes. She selected her economics and shopping mall management classes as the subject for our in-depth discussion of her technological applications in her case study.

During the interview, Dr. E expressed her passion and determination to adopt learning technologies that would help her students to understand abstract concepts more easily. She strongly believed that adopting various technological tools would benefit her teaching practice; therefore, she applied for university grants to mainly help fund her production of teaching videos and VR applications using university resources, such as animation software, recording facilities, and technical AV support.

Dr. E believed that video and VR are effective learning tools for explaining abstract real estate concepts. In addition to using PowerPoint slides, she developed and produced animated short videos. She also used VR technology to produce interactive activities for her course. Dr. E fully used the freely accessible technological resources offered by UHK for her teaching purposes. For instance, she used learning management tools (e.g., Blackboard, Panopto), which allowed her students to download learning materials and videos. She uploaded all videos for her students to watch to Blackboard, which is hosted by Panopto, to track her students' viewing records. Dr. E used these functions to monitor her students' viewing status and to help any students who fall behind their peers. She also used file-sharing tools, such as Sharedrive, for file sharing and communication.

Dr. E also used interactive tools such as Kahoot! and uReply for class interaction. In particular, she used uReply to ask questions in class and her students can reply through their laptops or mobile phones. Dr. E said that she sometimes used uReply to give short quizzes when she wanted to find out whether her students had watched the videos or not. She was very satisfied with the videos she produced. She commented that her videos helped her students to understand certain concepts more easily and quickly.

Dr. E adopted multiple assessment methods such as individual assignments, group projects, in-class quizzes, and final examinations to assess her students' abilities to apply the taught concepts. She used the peer evaluation system CATME to evaluate the performance of individual team members.

Dr. E expressed her gratitude for the support offered by UHK's technology resource centre. She was not a tech-savvy educator who could produce videos and VR on her own. Accordingly, she used grant funds to obtain professional assistance to support the technical aspects of production, such as animation, voice-over, 360-degree photos, and adding hotspots to photos.

She indicated that although she required technical assistance from professionals to produce animated videos with related images, text, voice-over, and background music, she was responsible for all the data collected, scriptwriting, image sourcing, and even copyright clearance for certain images. In our interview, she described these responsibilities as “very time-consuming,” but she considered that her efforts were justified.

Dr. E believed that her students’ learning can be enhanced through visual enhancement. She considered videos as a good teaching tool to facilitate student learning because of its advantages of time effectiveness and delivery convenience.

Dr. E believed that video helped her to easily and succinctly explain abstract theories compared with her normal in-class verbal explanations. She asked her students to watch her videos before class and further elaborated on the video’s abstract concepts in class when necessary. Dr. E used uReply, a UHK-supported interaction platform, to assess her students’ needs. She used uReply to ask her students questions related to the video they were supposed to watch before attending class. This practice served two purposes: that is, to ensure that students watched the video as part of their homework and to confirm their level of understanding. Dr. E reflected that she received positive student feedback about her use of videos, which indicated that the videos were useful in explaining concepts and that the students perceived the videos as a useful learning tool.

Dr. E believed that visualisation helps explain abstract concepts. She used agglomeration economies as an example. Instead of explaining in class how businesses can be clustered, she used a video with relevant images to present her students with concrete examples of stores lining a street selling sneakers, a flower market, and other clustered businesses. Dr. E further explained her reasons for using visualisation based on various research studies that suggested visualisation was a more effective way for students to learn. She was confident that her use of videos was appropriate. She conducted a survey to determine her students’ preferences for her videos. Dr. E reported that 56% of her students preferred a physical field trip and 44% opted for a virtual field trip, but 93% agreed that video could be a good substitute for a physical field trip.

The interview process strongly reflected the manner in which the figured worlds at UHK shaped Dr. E’s identity. The figured worlds at UHK had a strong impact on Dr. E’s pedagogical

designs. Although Dr. E did not have the necessary technical skills to produce her own videos, UHK's technical and financial support facilitated Dr. E's technological plans. I asked Dr. E why she used videos instead of other teaching tools and Dr. E said that she has done a substantial amount of reading related to teaching strategies on effective teaching methods. She also conducted her own surveys to identify her students' preferences for her adoption of video and VR. Her interview revealed that Dr. E implicitly demonstrated her desire to be a good educator who invested time and effort to develop appropriate materials to help her students learn. Dr. E stressed the importance of having her students learn something and that she "wanted them to understand what they learn." In addition, she "needed a lot of time to do something like developing videos" but it was a worthy endeavour. Dr. E also emphasised that "student learning is very important to me." She wanted to try different methods to help her students learn. She said that she hoped they would remember her teaching for a long time:

Not just like they learn it today, they forget about that tomorrow. That's why I always try to use a new way, so that maybe when I meet them a few years later, they will still remember. They may say that they still remember our field trip. That I have introduced this building, that building. (T2)

The above quote reflected Dr. E's strong belief that using a new technique helped her students learn. She also perceived learning as knowledge that must be remembered and last forever. Although she did not define the term "new," the tools she described related mainly to digital platforms such as uReply, CATME, Blackboard, Panopto, Kahoot!, and technological applications such as video software and PowerPoint.

In the lockdowns during the COVID-19 pandemic, Prof. E frequently used digital platforms for online teaching, such as Kahoot! and uReply, to facilitate in-class activities. She also reflected that she used VR videos to replace in-person field trips. In our follow-up interview, which was focused on Prof. E's online and offline digital pedagogical designs, Prof. E reflected that she used quite similar types of digital technologies as listed above. However, she noted that she used interactive digital platforms such as Kahoot! and uReply more frequently online than offline. In this case, Prof. E's digital pedagogical designs remained unchanged online or offline. In this case study, I observed that she purposely adjusted her use of time, space, and frequency to meet her students' learning needs.

3. Understanding Multimodality Using the 3D Framework—Dr. E

Dr. E used animated videos with images and bold keywords supported by music and voice-overs to explain abstract concepts. The animated character shown in Image 6 spent 10 seconds reading aloud the definition of agglomeration while music played in the background. Dr. E used an animated explanation to replace a direct explanation in class because visualisation is more effective than reading and telling.

It is about business clustering. If you just read it or explain it, it is hard for students to imagine it. But when they watch the video, they can see what is actually involved in agglomeration economies. (T2)

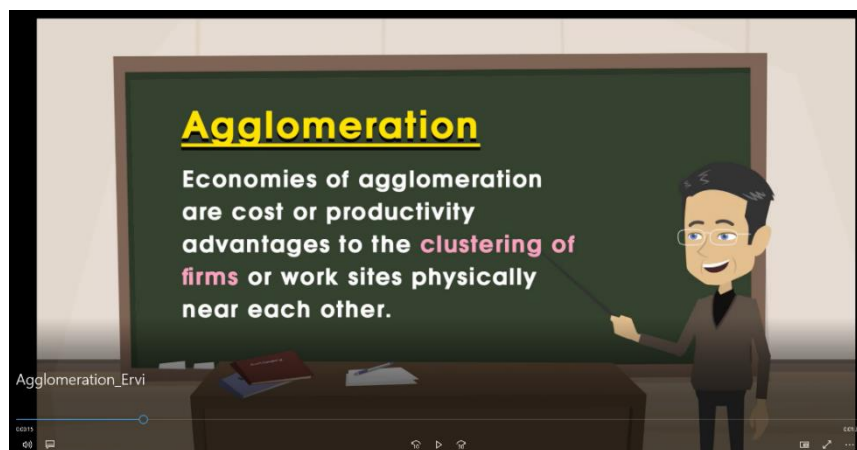


Image 6: Dr E's video sample.

I used Green's 3D model to understand Dr. E's pedagogical design and found that she technically translated the textual definition into a more visual format using multimodalities, such as music, animation, and voice-overs. Kress (2003) stressed the different affordances of different modes. The animation effect adopted by Dr. E (Image 6) served multiple communication purposes; that is, the students did not just read text from the screen, they could absorb the concepts through different modes, such as the character's verbal explanations of the concepts, the yellow and pink colours used to highlight the importance of two concepts, and the key message displayed at a specific time.

According to Dr. E, she felt that her students would understand a concept much more quickly by watching her visual representation.

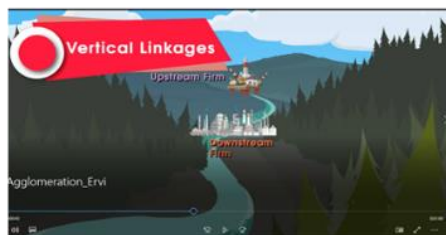
If students watched the video before they come to class, where I only briefly explain the concept, they may understand it much more quickly than in the past. (T2)

Using videos increases learning effectiveness. Following Kress and Van Leeuwen (2020), Dr. E's video production can be interpreted as using multiple semiotic modes to communicate meaning with various functions through various semiotic materials. In particular, Machin (2007) observed that visualisation has three functions in the communication process. Image 7 showed how Dr. E illustrated the concept of agglomeration economies in an animated video.

The first frame in Image 7 used an image of a stream to carry an ideational metafunction; that is, its semiotic material could represent ideas beyond its own system of signs (Machin, 2007). The image of a stream denoted the meaning of upstream and downstream firms by representing the movement of water as the link between the upstream and downstream firms. From top to bottom, the images in Image 7 demonstrated the animations presented at different times to represent interpersonal and textual metafunctions, as suggested by Machin (2007). These



00:40
A image of a stream



00:41-00:45 Voice over script
Vertical linkages mean the linkages of upstream firm and downstream firm in the production process



00:45-00:51 Voice over script
Upstream stage means the stage of extracting raw material



00:51-01:00 Voice over script
Downstream stage means the stage of processing raw material to a finishing product

Image 7: Dr E's animated video (agglomeration theory).

interconnecting roles of text, images, and modes, such as colour and animations, carried meanings that helped to create the students' overall understanding.

The images in Dr. E's video were very direct and she used bold words to address various abstract concepts. In another example, Dr. E sometimes used two colours with corresponding arrows to assist her vertical and horizontal textual explanations of the concept of agglomeration economies (Image 8).

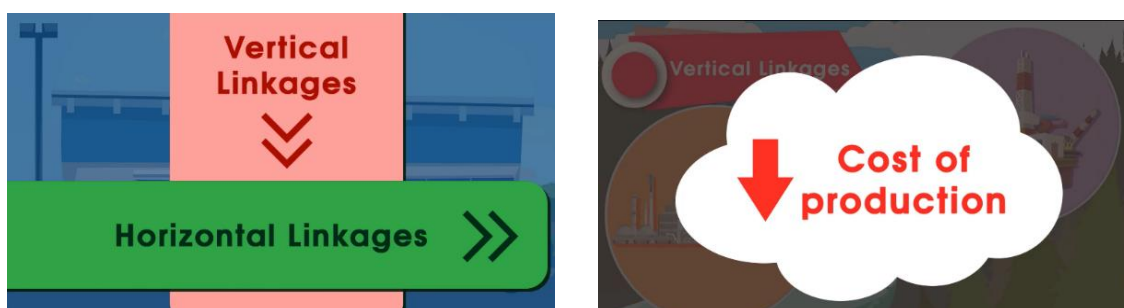


Image 8: Dr E's textual representations using text, colours, and symbols.

Instead of verbally communicating the meaning of agglomeration theory in her classes, Dr. E asked her students to watch each video as part of their preparation for her classes. She used a short quiz to check her students' understanding of the videos they watched.

Following the results of these short quizzes, Dr. E adjusted her explanation of the concept, which she then discussed with her class. According to Dr. E, this organisation of her classes reduced her explanation time from 30 minutes to 10 minutes.

I used Green's (2012) 3D framework to understand Dr. E's pedagogical design. For example, the operational function of video-making was a core feature of her pedagogical design process. She used multiple modes to fully translate a concept that was originally in text format to help advance her students' understanding using different affordances of images, audio, colours, and animations. Her decision to use multiple modes considered her students' learning preferences, which I believe were cultural in nature. These pedagogical design decisions were also critical in the sense that Dr. E decided that videos would be the most representational means to transform text-based concepts into something different.

The operational, cultural, and critical dimensions of the 3D framework were played out simultaneously in Dr. E's adoption of videos in her pedagogical design. In her classroom, videos function as an operational tool for teaching. The decision to use animated videos was

an act that she exercised her power as an educator to decide a digital tool that she belief to be an effective tool to assist student learning. The cultural dimension can also be applied in her case; that is, Dr. E used multiple channels to cross-check the usefulness of these learning technologies in her pedagogy. She administered quizzes to check whether her students had watched the videos before their classes. She also used surveys to understand her students' video-watching preferences. These operational, cultural, and critical dimensions all played a role in Dr. E's pedagogical design. However, the cultural dimension seemed to have a higher priority in her decision-making process than the other two dimensions.

4. Connecting Dr. E's Identity with the Cultural Dimension and UHK's Figured Worlds

In her role as an educator, Dr. E played a supporting role in her students' learning while teaching. She tended to change her pedagogical design to improve her students' learning. In particular, Dr. E believed that visualisation helped her students to better learn abstract concepts; therefore, she technically used different multimodalities to transform text into images. The figured worlds at UHK impacted Dr. E's adoption of multimodal pedagogical designs to varying degrees through its many available grants designed to encourage scholars to develop digital teaching materials. Accordingly, Dr. E applied for and received several UHK grants to help make her teaching videos. While she technically did not know how to use certain modalities in the video-making process, such as animation effects, character designs and drawings, and voice-overs, Dr. E was able to use UHK's financial and technical support as resources in her video production.

Dr. E developed her identity as a teacher through her reading and students' feedback. The figured worlds at UHK have impacted her pedagogical planning and decisions. In the following interview excerpt, Dr. E implicitly expressed her strong desire to become a good educator. She repeatedly stressed that she wanted her students to succeed. Although she used the word "I" several times during our interview, her actions were not purely dominated by her own identity of wanting to be a good educator. UHK's financial and technical support also affected her pedagogical design decisions because they provided Dr. E with the necessary resources for delivering her lessons.

I wanted my students to learn something and they should understand what they are learning. I told my students that these concepts were very important. Even if I must take a lot of time to do something like creating videos, it is worth it. (T2)

Dr. E constantly solicited feedback from her students and adjusted her teaching practices in response to their feedback. Her behaviour is consistent with the concepts proposed by many scholars (Beijaard & Meijer, 2017; Varghese et al., 2005) regarding the complexity and dynamic or static nature of an educator's identity. Dr. E's story demonstrates her personal learning throughout the process and how it translates into her video production practices.

I read in an article that visualisation is one way to make students understand abstract concepts; that's why I try to get them to watch the videos and see whether they learn better. (T2)

Dr. E used videos to aid her students' learning based on scholarly articles pointing out the benefits of learning through visualisation and her thinking was confirmed by her students' feedback. In addition, Dr. E provided her students with learning support that allowed them to learn at their own pace. For instance, she asked her students to watch each video before attending her classes and also briefly explained the related concepts after checking her students' viewing efforts using quizzes.

When I applied the 3D framework to Dr. E's identity, I found that the cultural dimension seemed most appropriate. Dr. E tended to rely on UHK's technical and financial support to produce her videos and she was highly aware of her students' preferences and feedback. I saw Dr. E as being culturally driven. In addition, she adopted institutional support for her video production and partially based her teaching tools on her students' feedback. Her actions were closely linked to UHK's support and recognition of her work. She was concerned about her students' feedback and although her decisions were mainly based on her self judgement as an educator, they represented the results from negotiating self belief with the external institutional supports and her students' feedback. Her personal figured worlds were based on her strong beliefs and values and knowing what was good for her students. As a result, she adopted the learning technologies that she considered were best suited for her students' learning. Nevertheless, Dr. E relied on student feedback to confirm her teaching practices and adjust her actions.

I also conduct surveys that ask my students whether the videos can help them understand the graphic concept. Many students agreed that the videos helped. (T2)

Therefore, Dr. E's educator identity was shaped in various respects by the figured worlds at UHK, such as award recognition and technical and financial support. This case study also demonstrated the strong connectivity between Dr. E's pedagogical decisions based on her social interactions and the 3D model's cultural dimension (Green, 2012). This case study also illustrated how Dr. E made her pedagogical decisions based on her students' feedback and how she used UHK resources to actualise her pedagogical designs.

E. Dr. J's Teaching Experience—Management Course

1. Dr. J's Profile

As an educator, Dr. J had 10 years of teaching experience. Her research interests included corporate governance, corporate boards, management teams, and strategic change. She worked for 3 years as the undergraduate programme director for a business school and was later changed to be the programme director of an MSc programme at UHK. Dr. J mainly taught undergraduate senior-year courses at UHK, including strategic management, organisational behaviour, and human resource management.

Dr. J was a leading member of the business school faculty's innovative teaching and learning task force, which promoted innovative teaching methods and facilitated technological applications for business school educators through regular teaching skill-sharing workshops. Dr. J received the "Most Popular" poster award several times at UHK's annual teaching and learning innovation expositions. One of her projects, using GoAnimate to create teaching videos, was widely recognised at UHK and our interview was videotaped to capture her innovative practices for sharing with other UHK educators. Dr. J actively used innovative teaching tools and frequently recommended solutions and applications to her UHK business school colleagues.

2. Teaching Philosophy

Dr. J actively applied for UHK grants to help her obtain extra time and support to develop digital teaching materials suitable for her classes. Dr. J usually applied for at least one grant per year. These grants generally require the recipient to submit a mid-term report and a final report to explain the progress of their project and its outcomes. All grant recipients must present

their findings at UHK's annual teaching and learning innovation exposition, where Dr. J was an active participant.

Dr. J believed that different digital tools and technological applications serve different teaching purposes. Her thinking was aligned with Kress's (2003) opinion that different multimodalities have different affordances. She used animation/storytelling to help her students understand different organisational behaviour concepts. She also created stories to explain strategic management concepts.

As a big movie fan who loved creating stories, Dr. J was enthusiastic about trying new technological tools. She constantly updated her teaching tools and modified her teaching materials to best suit her students' learning pace and needs. She was determined to try out different technological tools and was willing to pay for those tools out of her own pocket. Following Dr. J's interview, I realised that she had an attitude of never giving up and kept trying to adopt new learning technologies. In our interview, Dr. J gave many examples of how she used different digital tools for content delivery, in-class feedback, and after-class student-to-student collaborations.

3. Understanding Multimodality Using the 3D Framework—Dr. J

Dr. J made full use of learning technologies in her teaching practice. In this case study, she selected her organisational behaviour course as the subject for our in-depth discussion to demonstrate how she used GoAnimate software to create her teaching materials.

As a big movie fan, Dr. J learned movie production techniques using GoAnimate, which she used to produce most of the videos for her organisational behaviour class. Like the other two educators in my case studies, Dr. J made annual applications to obtain the UHK courseware grant in addition to the teaching and learning grants to develop new pedagogical tools. Unlike the other educators, who required technical support from vendors and a professional production team, Dr. J produced all her videos without external help. I found that Dr. J was very motivated to learn about and use new digital tools to produce her own teaching materials. One of the reasons that Dr. J actively searched for digital tools was because she was dissatisfied with the YouTube videos available online. Therefore, she created tools that could help her produce her own videos.

I found some YouTube videos, but they were not consistent and not systematic, not in terms of learning, but in terms of content. I thought maybe I should create my own materials. (T3)

Dr. J selected GoAnimate as a tool to help her make videos. She loved creating her own storylines and wanted to write her own scripts, select images, and put everything together to tell a story. However, she was not good at drawing and taking photos was too time-consuming; therefore, she used GoAnimate because the software included ready-made characters, backgrounds, and animation effects.

I just want to sit in front of the computer. Someone offers ready-to-use characters. Yeah. All you need to do is put things together. So, to me, it's much easier. (T3)

Dr. J used storytelling to teach organisational behaviour theories because she believed that her students did not have the patience to read text-based case studies. Therefore, she felt that converting a text-based case study into a video story was a workable solution for this problem.

Instead of using a 30-page text-based case study, the students usually do not have the patience to read the case. I wrote a story and created a video case study instead. (T3)

Dr. J also considered that storytelling could be used to explain abstract concepts to students more easily. She used the example of teaching the concept of cognitive dissonance with reference to organisational justice. Instead of telling her students the definition and giving examples of organisational justice, she created a story using two scenarios with good and bad examples, respectively. She asked her students to watch the video, compare the two scenarios, and apply the concept.

I created one good example where the employer treated their employee fairly in different situations. I also created a bad example using the same situation, but the boss had a very different attitude and strategy. I wanted my students to tell me about organisational justice concepts, such as informational justice, interpersonal justice, procedural justice, and all kinds of justice. (T3)

Dr. J applied her storytelling techniques using GoAnimate, where she converted a text-based case study into a digital storytelling format. She used the GoAnimate software to create her own characters based on various demographics (i.e., age, job position, gender, nationality) and designed various backgrounds (e.g., workplace, home, park) for the storytelling context. In her 10-minute video, Dr. J created different characters (see Image 9) to play different roles in her



Image 9: Dr. J's animated characters created for a storytelling case study.

case study, where each character's roles were clearly illustrated with labels and a background colour. These characters were designed carefully to represent different ages, races (as shown by their hair colour), and hierarchical positions at the two hotels in the case study. At the beginning of the video, Dr. J explained the background of the case study using text on the screen with fast-paced music playing in the background.







Time	Stages and scenes	Time	Stages and scenes
0:00 – 0:05	Music playing while two text box appear using "Fly in" animation effect 	0:18 – 0:22	Music playing while two characters represent X2 hotel (CEO, VP Finance) appear 
0:05 – 0:13	Music playing while two text box appear using "Fly in" animation effect 	0:22 – 0:28	Music playing while the other two characters represent X2 hotel (VP Marketing, VP HR) appear on screen 
0:13 – 0:17	Music playing with a question remain on screen for 4 seconds 	0:28 – 0:36	Music playing while three characters represent X hotel (GM, DOM, DOHR) appear on screen 

Image 10: Introduction of characters in Dr. J's case study animation.

Dr. J presented the case study in chronological order (see Image 10) using a storytelling format with animated cartoons.

In addition, Dr. J used different backgrounds to refer to the different company contexts, which were rich in their socio-cultural implications (see Image 11). The executive office setting indicated a formal conversation among senior executive team members, while the home setting indicated that one of the characters, the general manager, persuaded his friend to join his hotel



Time	Stages and scenes	Voice-over
0:55 – 1:05	(1) CEO sitting on the left talking with captions appear on screen using executive office 	We have a problem with X here. Revenue has not been good for two years. I know it's economic downturn, but we need to do something. Any suggestion?
1:05 – 2:42	Executive team identified problems, find solutions to operate the X hotel and decided to hire a new General Manager to operate X hotel	
2:42 – 3:42	George is hired as new General Manager. He wants to persuade his MBA classmates to join his team. He visited his home and talks about the marketing ideas.	
3:43 – 3:53	(2) George sits on the right is talking to his MBA classmate (Michael) of the new marketing initiatives. Using home setting. 	We are lucky to have the best designers working for us right now. This old place will have a total make-over. I have plan for the grand opening ceremony, media, celebrities, food...

Image 11: Dr. J's different background designs (executive office, home setting)

business. I worked in the hotel business for more than 20 years; Therefore, I understood that business persuasion required both formal office negotiation and a personal relationship. I understood how Dr. J's background design correctly reflected real-world business situations, such as how an hotel general manager may communicate business ideas in both formal and informal environments. This example helped explain the case study to Dr. J's students and left room for them to think about the implications of the story. Machin's (2007) metaphorical association could be used to interpret Dr. J's rationale for using these diverse backgrounds in her videos. When students watched videos set in an office, an elevator, or a home, the background set design helped them to associate the case study with something familiar, which

made it easier for them to formulate their own interpretations and representations. The elevator setting (Image 12) implied that the general manager was attempting to persuade his subordinate, the human resources director, that his new ideas were valuable. All these settings were rich in cultural implications because they provided a substantial amount of information

5:31 – 5:43	(4) George talks to DOHR in the elevator about cutting staffing cost.	Hi Harry, I have an idea about cutting staffing costs. What about simplifying our structure and removing some supervisory positions?
5:43 – 6:02	George continue to persuade Harry with multiple cut cost solutions. Using the elevator setting.	

Image 12: Dr J's elevator background designs.

to Dr. J's students about certain company practices in both formal and informal contexts. The students were provided with substantial leeway to consider the implications of certain behaviours, which were represented by the different backgrounds. Therefore, Dr. J's pedagogical design process simultaneously included operational, cultural, and critical dimensions. Dr. J knew exactly which digital tools she wanted to use in technically producing her videos and the expected outcomes. In converting a text-based case study into a fully animated movie, she critically manipulated multimodality in her video storytelling process based on her vast knowledge about multiple modes, such as animated characters, colours, texts, and audio. I used Green's 3D (2012) framework to understand Dr. J's pedagogical design and concluded that she was very critical in choosing the best approach to teaching her class. In addition, she was critical about which multimodalities could be used to best translate and represent the meaning of the original case study text. Although the cultural dimension was strong, such as the use of UHK financial support, the critical dimension seemed to play a more dominant role in Dr. J's case study. That is, she critically chose the best teaching tools and regardless of whether she was financially supported by the UHK or not, she decided that storytelling using animated movies were her tool of choice in her classroom teaching practice.

Dr. J used UHK grants to purchase animation video making software, but she expressed a willingness to pay for learning technologies out of her own pocket if UHK did not provide financial support. Dr. J strongly believed that educators should not simplify situations in the complex business world and her students should be exposed to an environment that provides enough time for critical thinking to reflect on their own understanding in more complicated contexts. Therefore, her storytelling methods replicated these more complicated business situations. She expected her students to have different conceptions of these situations because of their very different understandings and life experiences. She considered GoAnimate to be the most appropriate digital tool to meet the operational function; however, she also observed that she would also adopt other suitable tools if available. Therefore, Dr. J used multimodality as a tool in her teaching practice.

4. Connecting Dr. J's Identity to the 3D Framework

As an educator, Dr. J continually tried to apply new learning technologies in her teaching practice. In particular, she was a strong believer in using visual images. I am personally familiar with Dr. J's love of reading and her constant search for new innovations in learning. Her identity was focused on her self-sustained figured world, where she enjoyed exploring new learning technologies and testing them in her classroom. She admitted that she did not know whether her students liked her new tools or not. Nevertheless, she wanted to try them in her classroom, even though she sometimes realised that these new ways of teaching were not appropriate. However, she had a very strong sense of self-improvement and self-learning was connected with her identity as a professional educator to help her students learn through storytelling.

What I am actually looking for is a storytelling tool. Yes, it's not only a technology, it's just a tool, right? When I reflect on my experiences, I think that if I read some boring story or a theory, if I can transform that theory into a story, to me, it's an achievement. (T3)

Therefore, external influences such as negative student feedback changed some of Dr. J's pedagogical designs. For instance, she initially wanted her students to co-produce videos with her, but she received negative student feedback at the end of the semester about these co-productions. Although she abandoned her original idea, she continued to produce her own videos. Alsup (2006) explained that such decisions reflected a negotiation between educators' personal and professional selves. Dr. J believed that asking her students to produce videos by

themselves would result in learning from the process. Following her students' feedback, however, she changed the project format. Although she still wanted to use this storytelling method, she changed the learning method to meet her students' needs. Brooks (2016) described this process as the ongoing negotiation of personal and professional identities.

I did that project only once. Again, I expected my students to be interested, but it turned out that some students really did not think they could be creative. They were a bit scared by the things I asked them to do. I think GoAnimate is an easy enough tool. I learned to use it in 1 hour. It's very easy. But I have to say probably because I am interested in film and in editing, I can think of tricks to create certain visual effects, but not everyone is like me. I shouldn't make that assumption. (T3)

Dr. J developed her identity based on her passion for movies and her wealth of knowledge on how to tell stories using storyboards. She built teaching materials around her interests and strengths in transforming text-based information into images. The figured worlds at UHK offered financial and technical support to Dr. J, but her self-identity functioned more critically in her pedagogical planning process. In a follow-up interview, Dr. J confirmed that she did not care what was offered or provided by UHK. She sought financial support only when she needed it and she admitted that she based her pedagogical planning on her own interests.

Like Prof. M., Dr. J also had strong beliefs about what must be taught and what is good for students' learning. She believed that storytelling was the best way to promote their learning. Critically, she passionately believed in the effectiveness of the technological tools she used in her teaching practice.

Instead of using a text-based case study, you know, 30 pages, usually students don't have the patience to read the case. So, I made a story and created a video case study. (T3)

Dr. J required her students to do what she thought was best for them. Even if her students did not initially appreciate her new teaching methods, she believed that they would appreciate her lessons in the long term. In this way, Dr. J's professional identity was oriented around her teaching philosophy. According to the 3D model, her philosophy fit well with the critical dimension. I concluded that Dr. J was very critical about her teaching practice in the sense that she made decisions based on her own beliefs about what was good for her students.

F. Connecting Educators' Identities with the Critical Dimension in the 3D Model

Beijaard and Meijer (2017) observed that an educator's belief is central to the formation of their identity as an educator, which influences their engagement, commitment, and actions

when teaching. When I asked Dr. J how educators should use learning technologies in their teaching practice, she talked about how her own interest in organisational behaviour changed some of her teaching designs. The excerpts from our interviews below explained why Dr. J used storytelling in her teaching practice based on her personal interests in psychology and meaning-making through the storytelling process.

I'm very interested in psychology. It's not my academic training, but in my studies, I write a lot about it, and I like the subject a lot. But I was a little bit surprised that this generation was not really interested, as I had expected. (T3)

Some movie editing software is not easy to learn and is very technical. GoAnimate is very easy. But I think the most important thing to me is that many psychological theories are stories. If I just tell these stories in a lecture, I cannot capture my students' attention. That's why I used GoAnimate to create animated videos. (T3)

Dr. J was obviously very interested in her topic. She believed that psychology is an interesting topic that every student should love. When she discovered a gap in her students' expectations, however, Dr. J decided that using learning technologies would help her explain the topic of psychology in an interesting way.

This finding was supported by many other studies that found that the dynamic development of educators' identity can be complex (Beijaard & Meijer, 2017; Varghese et al., 2005), in addition to being both personal and professional. As noted earlier, Beijaard and Meijer (2017) argued that "one who is as a person is strongly interwoven with how one works as a professional. Both dimensions together represent one's educator identity" (p. 177). In other words, educators develop their identity as a product generated by their interaction with their students.

When Dr. J realised that the "traditional" case studies and following group discussions were insufficient to spark students' interest in the topic, she changed her teaching practices to use a new technological tool, GoAnimate. Dr. J believed that this tool would help increase her students' level of interest in psychological theories.

Varghese et al. (2005) explained the transition involved in adopting a new teaching tool as identity-in-practice. When exploring how an educator's identity influences their action, in this case I considered the adoption of certain technological tools. Dr. J's personal interest in movies became the main driver of her changes to her digital pedagogical designs.

I'm a big movie fan. I truly enjoy making movies. I'm not good at drawing, and to pick up a camera would be too time-consuming. I just want to sit in front of my computer and be

offered a ready-made character. Yeah. All you need to do is put things together. It's much easier for me. That's why I applied for a teaching grant and started a GoAnimate project team in my organisational behaviour class. (T3)

Some movie editing software is not easy to learn and is very technical. GoAnimate was very easy. But I think the most important thing to me is that a lot of psychology theories are stories. But if I just tell these stories in a lecture, I cannot get student attention. (T3)

Every educator has their own preferences for certain technological tools, which were usually chosen based on their own interests in addition to their eagerness to try something new and test its effectiveness in their classroom. In Dr. J's case, she loved both movies and psychology. It was not difficult to see how her identity as a movie fan influenced her use of cinematic storytelling approaches in her teaching practice. The authoring process that Holland et al. (1998) described was reflected through Dr. J's activities in an interesting way. Dr. J believed that psychology could be more effectively taught through storytelling. She automatically connected storytelling with movies and found GoAnimate was an easy tool to use for her storytelling in class. Dr. J taught herself how to use the software and made a movie by herself; in this way, she translated the case study into a new animated format. Her process of internalisation explained her adaptation activity. In this example, the changes in Dr. J's pedagogical design process were heavily influenced by her identity as an educator. In contrast, the figured worlds at UHK appeared to have had no direct impact on Dr. J's pedagogical planning process. The following excerpts demonstrated how Dr. J's identity as an educator interacted with the figured worlds at UHK.

UHK had nothing to do with that. If I enjoy doing something, I will do it for myself. I mean, everything I do, I do for myself because I enjoy it, because I think that I would like to do something. It has nothing to do with anything external. I mean, I think maybe it is my personality or whatever. I don't care about university expectations or policy orientation, or, you know, some kind of external pressure. (T4)

When exploring the effectiveness of her choice of teaching tools, Dr. J commented on the tensions that she did not originally anticipate and how she needed to make adjustments to her teaching practice.

I did that project (GoAnimate) only once. Again, I expected my students to be interested in making videos, but it turned out that some students really didn't think they could be creative. They were a bit scared by the things I asked them to do. Although I think GoAnimate is an easy enough tool. I learned to use it in 1 hour. It's very easy. But I have to say probably because I am interested in film and in editing, this kind of stuff, I can think of tricks to create certain visual effects, but not everyone is like me. I shouldn't make that assumption. But I think at their young age, they should be eager to learn, but it turns out

that maybe they're just too busy, they have too much other coursework or whatever. So it turned out that not all of the students enjoyed the process. I got several complaints saying that it was too much work. (T3)

As an educator myself, I fully understood why Dr. J stopped asking her students to co-produce a video. As educators, we often assume that something we like will also interest our students. We also assume that our students are more accepting of new technological applications and that they enjoy new types of learning. In this case, it turned out that the students did not enjoy the process. Following Holland et al. (1998), who explained that identity is constructed through interactions between students and educators based on their feedback and comments, I observed that despite Dr. J's enthusiasm about introducing a new learning tool to her students, she had to abandon her plans after just one attempt:

But as I mentioned, not everyone was ready to spend so much time on reading visual stuff. Some students find it much easier to read text. That's why after a year of trying, I gave up on asking students to produce a video. I could spend time producing videos, but I wouldn't ask my students to do that. (T3)

Peterman (2017) stated that understanding the intersection of self and subject matter knowledge is crucial to understanding an educator's identity, particularly as "how teachers felt about themselves as learners of a content impacted their confidence and their approach to teaching" (p. 196). Peterman (2017) pointed out that context, not content, usually impacts identity formation. Holland et al. (1998) explained the formation of self-identity based on Bakhtin's (1981) concept of dialogism, which was based on a mixture of the perspective of the 'I' and the words of others. According to Holland et al (1998), the self was "the nexus of a continuing flow of activity and is participating in this activity, it cannot be finalized" (p. 173) In other words, a person's identity can be considered as a combination of "I" and their socially identifiable relationships with their peers.

According to our above discussion, Dr. J was convinced that storytelling was an effective way to teach psychology theories. Although she initially wanted her students to be producers of their own learning, she returned to her role as educator and created the GoAnimate video project by herself following negative feedback from her students about the related heavy workload. She did not change her content teaching practice (i.e., psychology concepts), but changed her teaching method instead.

Holland et al. (1998) emphasised the importance of positionality in education. They explained that educators have the power to make decisions based on what they considered to be best for their students' needs. Prof. M believed that reducing the number of words in her PowerPoint presentations and increasing her verbal explanations in class improved her students' understanding of the taught subject matter. Therefore, she manipulated the flow of her classes to incorporate classroom discussions using different PowerPoint functions. Dr. E thought that using a video would save her time in explaining certain concepts and her students provided positive feedback about her use of videos. Therefore, she produced many videos with the assistance of various parties. In contrast, Dr. J believed that storytelling was a good method to explain her organisational behaviour concepts and used GoAnimate to create a video case study. Dr. J's need to keep up with technological applications and different learning platforms and videos could reflect this belief. In addition, she believed that it is the educator's responsibility to continue innovating teaching methods. Her pedagogical approach clearly showed that she always wanted to push her students' limits. Based on her strong beliefs, her applications of different multimodalities have provided examples to explain why she made these pedagogical decisions.

The impact of technology is a matter of possibility. It keeps me fresh. I don't like old stuff. I know that teaching practices can go on autopilot after a certain number of years. I don't want to just go to class and talk about this stuff. I want to have something new. I want to keep my mind active. I always tried to explain things from a new perspective. And sometimes I even go beyond the course content. I am still learning and trying to balance my students' needs, especially if I read about new issues that are not in my textbook. I just want to share them with my students, but how do I fit these new modalities into my teaching? I probably need a new video or a new exercise or something like that. Therefore, the impact of learning innovations is to keep me motivated to revise my courses. (T3)

Dr. E believed that learning technologies helped increase her students' level of understanding and videos were better for explaining abstract concepts.

I produced the micro-modules and these field trip videos because I really wanted my students to understand what I teach and, you know, for this course, the concepts are very abstract. Even if you read the books, the related concepts are still very hard to understand. That's why I need to prepare some things for my students, to help them understand. I showed them the visuals so they can see that the whole street was selling sneakers. (T2)

Using Green's 3D critical dimension, I found that the three educators were very critical in their choices of pedagogical applications. For instance, Prof. M used only YouTube and PowerPoint slides in her teaching practice. The concept of positionality proposed by Holland et al. (1998)

may be used to explain her strong belief in her pedagogical decision. As an exemplary educator who has received the UHK University Education Award, Prof. M's strong identity helped her make a confident decision that her adoption of learning technologies would be the most beneficial for her students' learning.

Next, I use Dr. E as another example to understand how she made her critical pedagogical decisions. Dr. E is an educator who receives excellent student feedback. She has also received UHK's Best Faculty Teaching award. Considering this positionality, which extended outwards, Dr. E clearly wanted to continue being recognised as a good educator. Therefore, her students' feedback represented the "words" of others that informed her of her identity as a good educator. Her inner desire to be a good educator achieved explicit results; therefore, she was motivated to continue using learning technologies.

In contrast, Dr. J's authoring process was obvious in that she constantly made adjustments and adopted more technologies in her teaching practice than the other two case study educators. Her strong motivation to be a good educator was reflected in her belief that her students would appreciate their lessons in the long term. As an example, Dr. J described how a graduate commented on the usefulness of knowing how to make a GoAnimate video at work.

Something that made me feel really good as one student, after he graduated, he came back and tell me, he used GoAnimate. He was doing a project, selling a product, something related to logistics for his own company. His presentation impressed his audience a lot. So I was happy. (T3)

Dr. J had her own definition of being a good educator through her provision of critical comments to help her students improve. In this way, Dr. J's strong figured worlds were very different from those of the other two educators in the case studies in this thesis. Her pedagogical decisions were determined more by her identity as an educator than by any positionality or authoring processes.

If I didn't tell my students how I really felt about their work, I wouldn't be being honest. Right? Because if I thought that they were lacking and that they were not doing a good enough job, but I just tried to be nice, hang out with my students and forget about my role as an educator, that wouldn't be right. Right after their presentations, I sometimes write long, long emails with very critical comments. (T3)

In this chapter, I discuss how the three educators' self-images and positional identities influenced their selection of digital tools and pedagogical decisions. Notwithstanding the similar positional power of the three educators, who had received various teaching awards from

UHK, their digital adoption decisions were very different. Both Prof. M and Dr. J had stable identities with strong beliefs about how to best facilitate their teaching practices using various digital means. While Prof. M used very simple PowerPoint slides, Dr. J used complicated, time-consuming, and self-produced storytelling videos. Both educators exercised their critical power to make pedagogical decisions with little influence from the figured worlds at UHK. However, while Dr. E also received a teaching award, she relied more on her students' feedback than her colleagues did and adjusted her digital tools based on their needs.

G. Chapter Summary

In this chapter, I explain how the figured worlds at UHK impacted these three educators' decision-making processes. I provide portraits of the studied educators (see Appendixes 1–3) to help readers understand their backgrounds, teaching philosophies, and adoption of digital pedagogies, such as how Prof. M used PowerPoint slides in her teaching practice, how Dr. E designed her digital pedagogy using videos, and how Dr. J used an animated video to teach a case study.

I also document in this chapter how these three educators operationalised Green's 3D framework through its operational, cultural, and critical lenses. This also demonstrates how the concepts of educator identity (Beijaard & Meijer, 2017; Varghese et al., 2005) and the figured worlds proposed by Holland et al. (1998) played an informative role in analysing the three educators' pedagogical decisions, from the technical to the cultural and to the critical dimension of the decision-making process.

In addition, I explain in this chapter how the figured worlds at UHK influenced the educators' decision-making processes and how their different identities led them to adopt various planning and pedagogical approaches. I also explore how the critical dimension played a dominant role in educators' digital pedagogical designs while also working through the operational and cultural dimensions.

In the next chapter, I explore how the conceptual 3D framework was applied in the three case studies through their teaching artefacts, educator interviews, and student interviews. I also explore how the 3D framework fostered greater awareness of digital teaching approaches among the educators.

CHAPTER 5: DISCUSSION OF RESEARCH FINDINGS

In this chapter, I summarise the interview results and the general findings from my analyses of the teaching artefacts provided by the educators in the three case studies in this thesis study. In addition, I discuss how Green's (2012) conceptual 3D framework was applied to the teaching artefacts and interviews with the educators and their students.

Green (2012) stressed the value of the 3D model, particularly the importance of the cultural–discursive dimension, when he suggested that meaning-making occurs through planning and teaching with multimodality. Green (2012) also emphasised the importance of teaching practices and suggested that they are transformative in themselves. By exploring the educators' actual technological practices in this chapter, I explain what changed, how the educators used multimodality in their planning and design processes, and the roles that their identities played in their decision-making.

Lankshear and Knobel (2006) suggested that digital technologies have made “contemporary changes and impacted on social practices in all the main areas of everyday life” (p. 24). I analysed the evidence from the educators' teaching practices based on my interpretation of the interview transcripts and artefact analyses using the PowerPoint slides, videos, and animated movies provided by the educators. In this chapter, my analyses of the teaching artefacts show how the educators underwent transformation by using different learning technologies to translate texts into visual images. In their criticism of pedagogical designs, Lankshear and Knobel (2006) referenced the “old wine in new bottles” syndrome. I demonstrate in this chapter that the three case study educators have become “new wine in new bottles” practitioners. I highlight their practices to illustrate how they transformed themselves from traditional educators teaching purely through texts into tech-savvy educators who know when and how to use different multimodalities as new teaching approaches. I framed my interview questions around Green's (2012) 3D model and explored the educators' technological teaching experiences through the model's operational, cultural, and critical dimensions. RQ1 focused on determining how the three educators adapted their planning and teaching to digital pedagogies, while RQ2 focused on understanding how the participants' varying approaches to planning and teaching changed their pedagogies. RQ3 called for an in-depth exploration of the participants' multimodal and design choices while RQ4 investigated whether the 3D

framework fostered a greater awareness of approaches to digital teaching pedagogies among the three case study educators.

Following the educator interviews, teaching material analysis, and student interviews, I attempted to understand the educators' use of learning technologies through their pedagogical teaching experiences and practices. The educators identified the influences and impact of their technological adaptation choices and their philosophies that affected their choices. I drafted this chapter during the data collection period in the lockdowns of the COVID-19 pandemic, when teaching modes shifted from face-to-face to online teaching. I conducted follow-up interviews with the educators to understand how they adjusted their teaching approaches during the pandemic, particularly with respect to learning technologies. I also conducted student interviews to understand their learning preferences and how they perceived the three educators' different teaching approaches. Nevertheless, the focus of my thesis study remained the educators' digital approaches, not their mode of delivery.

I centre the following three sections around the operational, cultural, and critical lenses of Green's (2012) 3D model to reveal the educational practices of the three educators in my thesis case studies. I used the visual analysis techniques suggested by Ledin and Machin (2018) to supplement my understanding of the operational, cultural, and critical dimensions of the 3D model. In addition, I used the figured worlds concept proposed by Holland et al. (1998) to provide an informative perspective in my analyses of the three case studies.

A. Multimodal Choices—Exploration Through an Operational Lens

In this section, I discuss how the studied educators used multiple technological platforms and tools in delivering their classes.

1. Prof. M's Multimodal Choice—PowerPoint Slides

All three educators had their own preferences for using different technological tools to deliver their learning contents. Prof. M used PowerPoint slides and occasionally embedded YouTube videos into these slides. As an educator, she minimised the use of learning technologies in her classroom:

No. I do not use any discussion boards or other platforms for teaching. (T1)

When I asked Prof. M why she only used PowerPoint to implement her pedagogical decisions, she indicated that PowerPoint was just a tool to assist her teaching practice, which was consistent with Schnettler (2012), who suggested that PowerPoint bullet points functioned as a visual instrument and a co-ordination tool to assist teaching. Although Prof. M considered herself as a show-and-tell educator who used PowerPoint as a visualisation tool where verbal explanations played more important roles in strengthening her students' meaning-making, she implicitly used PowerPoint slides to control her teaching time, draw her students' attention, facilitate discussions, and explain her teaching content.

Prof. M had a high level of awareness of having good control of her teaching time and pace. Her multimodal choices were based on the functionalities offered by PowerPoint and the manageability of the digital tool from both her perspective as an educator and that of her students. The following interview excerpt showed that Prof. M treated PowerPoint as a classroom management and content delivery tool using simple bullet points and transition effects to control her time and draw her students' attention to her verbal explanations. Her PowerPoint designs (Image 13) used only keywords, in line with her decision not to show everything on screen.

PowerPoint makes it easy for the students to follow my teaching flow. And it is also easy for me to control that flow. (T1)

Bullet points are the easiest way. I tend not to put too many words on the slides, because most of the time I like my students to follow me rather than just stare at a screen. (T1)

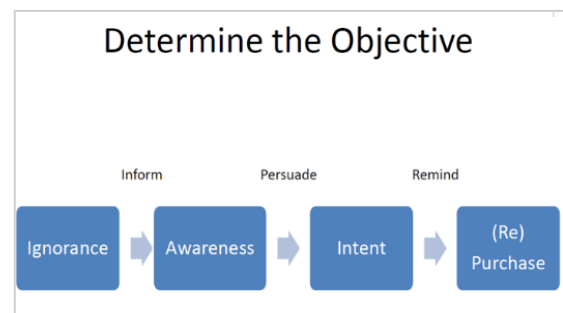


Image 13: Prof. M's PowerPoint sample 2.

2. Dr. E's Multimodal Choice—Video

In addition to using PowerPoint, Dr. E used university grants to make animated videos to help her teach abstract concepts. Dr. E also used videos to help her explain theories more clearly. According to Dr. E, her students took a longer time to understand in-class verbal explanations of abstract theories. However, presenting these ideas in videos facilitated her students' understanding.

The monocentric city model is really difficult to understand and I take a lot of time explaining it, but the students still cannot understand. (T2)

Dr. E developed her teaching philosophy based on the best practices suggested by other scholars. She believed that using videos and images enhanced her teaching practice.

I read research saying that when you can see the visuals, learning is more effective. (T2)

Dr. E believed that visualisation was more effective than reading and telling.

It is about business clustering. If you just read it or explain it, it's hard for students to imagine it. But when they watch the video, they can see what is actually involved in agglomeration economies. (T2)

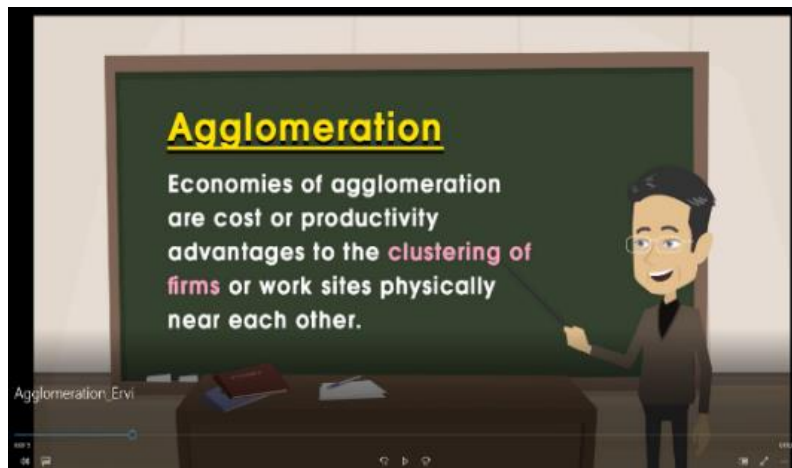


Image 14: Video explanation of agglomeration theory.

Instead of reading out aloud a definition of agglomeration economies, the video that Dr. E created starts with 10 seconds of an animated character (Image 14) reading the definition of agglomeration economies followed by images providing examples.

I used Green's 3D model to understand Dr. E's pedagogical design and observed that she technically translated textual definitions into a more visual format using multimodalities, such as music, animations, and voice-over. Kress (2003) emphasised the different affordances of different modes. Dr. E adopted an animation effect (Image 14), which served multiple communication purposes. Students do not just read on-screen texts, they perceive meaning through the different modes. For instance, they hear a verbal explanation of the concept from the animated character, the yellow and pink colours highlight the importance of the two concepts, and they feel the importance of certain key messages through different on-screen texts.

According to Dr. E, her students understood concepts much faster with the help of her visual representations.

If my students watch the video before they attend my class, they can understand my brief explanation of the concept much more quickly than in the past. (T2)

Using videos increased the learning effectiveness of students in Dr. E's classroom. In Kress and van Leeuwen's (2020) terms, Dr. E's video production can be interpreted as using multiple semiotic modes to communicate meaning through the respective functions based on these various semiotic materials. According to Machin (2007), visualisation has three metafunctions in the communication process: ideational, intrapersonal, and textual. The ideational metafunction referred to the ability of visual images to represent ideas beyond their own characteristics. For example, a picture of a stream (Image 15) can be used to denote the

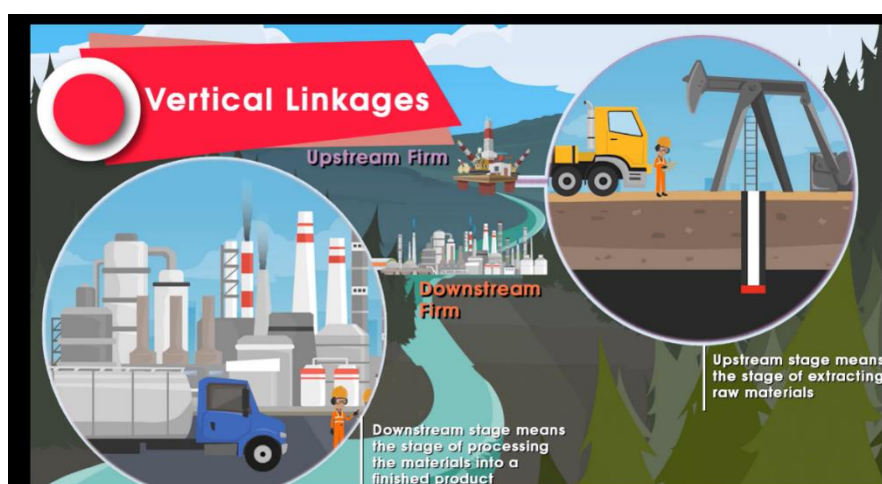


Image 15: Visual representation of the concept of 'Vertical Links'.

definition of up- and downstream firms and also represents the movement of water and the relationship between up- and downstream firms. The interpersonal metafunction referred to how Dr. E used image representation to help her students to understand the nature of up- and downstream firms. The textual metafunction considered the semiotic system must serve a function to form a coherent whole. In Image 15, the colour red was coherently used as the background support for the "vertical linkages" heading. In this video, Dr. E effectively interconnected the roles of text, images, and other modalities, such as colour and animations, to explain the overall meaning of her concept and help her students understand it.

Technically, Dr. E might not have been aware of all of these above theories, but she used UHK's resources and support to produce a video that serves her teaching purposes. The figured worlds at UHK served their purpose by providing Dr. E with technical and financial support.

I am very grateful because I was supported by the university. The technical support centre helped me to develop this video... I wrote the script and it took a long time, so it's very time-consuming. I needed a student helper to do the voice-over for me. (T2)

My colleagues ... helped me take some photos, I filmed with my teaching assistant and asked the student helpers to help me do the voice-over. (T2)

Dr. E based her multimodal choices on her students' learning preferences. She used videos to fully translate text-based concepts using multimodal means, such as colours, images, and audio. Like Prof. M, Dr. E's planned to use these digital tools (in this case, a video) to better manage content delivery because she believed that her students could understand an abstract concept more quickly, which allowed her to save time in class.

3. Dr. J's Multimodal Choice—Animated Movies

Among the three case study educators, Dr. J used the most technological tools to prepare learning materials for her teaching practice, including PowerPoint, videos, and YouTube. She also used other platforms, such as Socrative, Mural, Kahoot!, and Padlet, to create different interactive activities for her classroom. Following the focus of my thesis study, I explored in depth how Dr. J used GoAnimate to create her teaching videos.

Dr. J chose GoAnimate to make her animated movies for a few reasons. As a movie lover, she revealed that she was very good at storytelling, creating her own storylines, writing her own scripts, selecting images, and putting everything together. However, she was not tech-savvy in video editing, nor was she good at drawing. Therefore, she found that GoAnimate best fit her storytelling approach because the software was very user-friendly in that it offered ready-made characters, backgrounds, and animation effects.

Instead of using a text-based case study, which she said could be long as 30 pages, Dr. J used animation software to make an animated movie. In this way, she used storytelling techniques to translate a normal text-based case into a movie using images, audio, backgrounds, transition effects, and character expressions.

GoAnimate was a suitable software for Dr. J's storytelling needs. She was able to create her own characters (Image 16), develop her own storyboards and scripts, and design various backgrounds to illustrate the context of the case study.



Image 16: Animation characters created by Dr J.

In her 10-minute GoAnimate movie, Dr. J created nine characters to represent the distinct roles of staff at two hotels. She carefully used labels and a corresponding background colour to clearly illustrate each character's role and represent their different ages, races (as represented through hair colour), and hierarchical positions at the two hotels. Dr. J used computer-generated voice-over effects for each character's conversations, with text appearing on the screen and fast-paced music playing in the background. In addition, Dr. J used different backgrounds to assist her storytelling in different contexts. Image 17 illustrated how the animated characters conducted their conversations in different contexts through changes in background design. The selection of colours, characters, and background images in Dr. J's videos represented both denotation and connotation (Machin, 2007). For instance, the use of an elevator (Image 18) as a background explicitly informs her students that the general manager is informally talking to



Image 17: Animated scenes created by Dr. J.

the human resources director. However, it also implies the pressure from the general manager

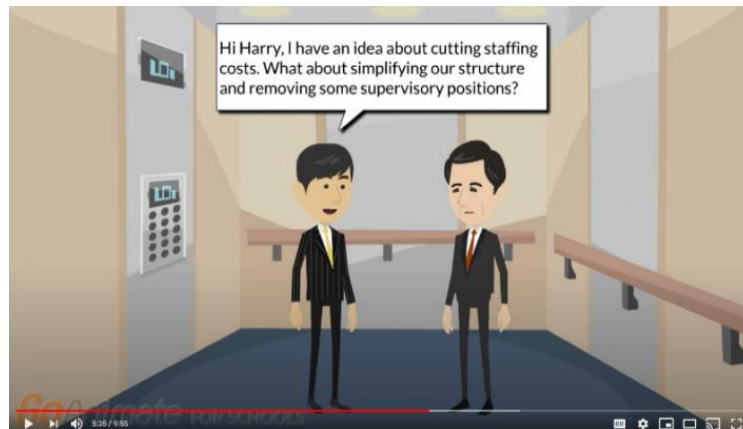


Image 18: Elevator scene created by Dr. J.

to persuade the human resources director to cut staff.

Dr. J used long shots and wide angles throughout her storytelling process. According to Machin (2007), the various interaction angles and positioning of the characters determine the perception of an image. Dr. J could apply these visual concepts in her video production process to ensure the objectivity of the storytelling process. The representation of all the images and characters from a distance using wider angles minimised objective representations of meaning and the students have more room to create the meaning of the video during their own watching process and to explore the possibility of more in-depth meanings from the texts, voice-overs, backgrounds, and character interactions.

Dr. J technically produced the entire animated video by herself using GoAnimate. She had the skills and knowledge to convert a text-based case study into an animated movie using multimodalities including sounds, texts, and images. Dr. J made her digital choices based on her love of movies. She strongly believed that the business world is complex and was determined to use storytelling methods to replicate more complicated business situations. She expected her students to have different thoughts after watching the animation because of their very different understandings and experiences of life. Therefore, using storytelling methods helped students to understand this complexity by enabling them to exercise their critical thinking skills through self-reflection and understanding during the viewing process. In this way, Dr. J used the movie to help her students self-generate their learning during the viewing process.

4. Different Multimodal Choices Served Different Purposes

I compared the three case study educators using Green's (2012) operational dimension in the above three subsections. All educators were tech-savvy, aware of the available learning technologies, and could use these technologies appropriately in their teaching practices. The differences between the educators were related to their level of use of learning technologies applicable in their teaching practices. The level of production and application of learning technologies in their teaching practices also varied from the minimalists like Prof. M, who mainly used PowerPoint and YouTube videos to more tech-savvy educators like Dr. J, who produced her own animation without technical assistance.

The figured worlds at UHK offered financial and technical support to encourage all UHK educators to adopt digital applications in their teaching practices. These figured worlds had a socio-cultural impact on the three educators. Although each of these educators made very different digital choices because of their very different levels of digital competencies, they all demonstrated their ability to use UHK's resources to fully transform their traditional text-based teaching practices into multimodal digital teaching practices during the COVID-19 pandemic. However, these educators leveraged UHK resources in different ways. For example, Prof. M used ready-made videos from YouTube, Dr. E produced her own videos by writing her own scripts and sought external production help from UHK's technology support centre and financial grants, while Dr. J acquired video-making skills and made her video using GoAnimate software with funds from a UHK teaching grant.

All three educators used digital tools to serve their very different teaching and learning purposes. Prof. M supplemented her teaching practice using learning technologies to enhance her lessons and control the flow of her in-class content deliveries:

If there is a video that I want to share with my students, I can simply link to it. If my students are not in class or want to review the video, they can always click the link at home. (T1)

I usually use the PowerPoint slides to control the flow of my teaching and my students use the slides to follow along. (T1)

Dr. E used learning technologies to facilitate her teaching efficiency and adopted videos following her students' feedback. In addition to considering effectiveness and time

management, Dr. E treasured her students' positive feedback, which motivated her to produce her own videos.

I did a survey asking whether the video actually helped them understand the graphic concept. And a lot of the students agreed. (T2)

Prof. M used PowerPoint slides as a tool for classroom facilitation, Dr. E used videos to teach abstract concepts and better manage her classroom, while Dr. J used animations to facilitate a higher level of thinking and learning among her students throughout their viewing process. Dr. J presented her video using a storytelling format as a tool to facilitate her students' further in-depth discussion. However, she indicated that she preferred to show her videos during face-to-face teaching in the classroom instead of making it available online.

Most of my videos are just stories. If I just show the video without having the related discussion, it doesn't make any sense. (T3)

I actually use my animated videos a little bit more often in my face-to-face classes. (T4)

In my follow-up interviews with two students regarding their learning preferences, both students confirmed that they preferred face-to-face lessons over online lessons. However, their preferences for multimodal means varied. The following excerpts demonstrated that Student A preferred learning using videos and images than pure texts, while Student B was a traditional student who relied more on paper-based learning models.

I like to use my iPad and MacBook to view the PowerPoint slides and watch the videos. Videos and images make it easier to absorb knowledge because text is kind of difficult and boring... Actually, I hate reading, so I think putting words into other formats or other methods benefits me more. (T5)

Receiving my education in mainland China where it's common for students to adopt an "all-paper" learning mode, I used to be much more comfortable reading physical materials and cannot really write with my computer keyboard. (T6)

When I asked the students about their preferences for digital learning tools, both students talked about video's functionality as a summary of lectures. This observation raised an interesting point about the affordance of the digital tools adopted by these educators for their classes. All three educators wisely developed their digital tools to serve only partial teaching purposes in their classroom and used multiple digital pedagogies in their classes.

The videos benefit students more because we must think for ourselves instead of just receiving all of the information using text ... if you use PowerPoint slides to deliver your

important points, the students just highlight and memorise them, but they don't know why the theory was applied in that case. (T5)

I personally do not appreciate videos that much because most videos presented in my major-related classes were not aimed to entertain but explained an idea. However, my mind will sometimes take this pause from the lecture to watch a video as a break and I might not pay attention to the voice-overs. I mainly preferred the educator's elaboration of supplementary videos to clarify some abstract knowledge if necessary.

The key lessons here appeared to depend on the educators' efforts to facilitate classroom discussion using different digital modalities. I asked the students a follow-up question to check their perceptions of the functionality of the various digital methods that the three educators adopted in their classrooms. Student A commented that she could not concentrate in classes conducted with only PowerPoint slides. She mentioned that although her educators asked questions and promoted their students' interaction in class, she lost concentration when PowerPoint slides were used exclusively, which defeated her learning process. She suggested that more breaks would be needed if only PowerPoint slides were used throughout the lesson. Considering Drs E and J's videos, Student A reflected that they increased her levels of interaction and interest. Nevertheless, she preferred that these digital methods be used in face-to-face classrooms rather than online. The following excerpt explained the limitation of Zoom sessions when the students expected interactions that could only be achieved in a physical environment:

I think it is the learning environment. I don't want to sit alone and just stare at my computer. I cannot see people's faces. Even the professor sometimes turns off her camera so I can just listen to her voice. It feels like I am watching YouTube. I want a learning environment where everyone is sitting in the classroom, and I can feel their emotions and see our interactions with the educator. (T5)

Student A commented that even when using interactive platforms such as Mural and Padlet, face-to-face settings were still better so that she could see people's reactions during their classroom discussions. Student B classified himself as traditional learner who was "easily distracted during online learning." He preferred his educators to elaborate on the taught concepts and use videos to supplement abstract knowledge. However, both students consistently required elements of classroom interactions regardless of whether they were learning online or offline.

The above evidence showed that all three case study educators in this thesis study could effectively switch their delivery of classes from offline to online formats by adjusting their

multimodalities appropriately. Regardless of their learning styles, their students demanded classroom/online interactions during both their offline and online lessons. The interview results showed that the educators' multimodality choices did not affect their students' learning. However, when and how the multimodalities were used made a significant difference in the students' learning process. The three case study educators were very sensitive in addressing their students' needs during the COVID-19 pandemic lockdown periods and made the necessary adjustments accordingly.

B. Teaching Approaches—Exploration Through a Cultural Lens

1. Prof. M's Approach to Using PowerPoint for Teaching

Prof. M tended to use simple words in her PowerPoint slides for her marketing course to guide the flow of her classes. She verbally explained the learning contents and supplemented the meaning of the simple words displayed in the PowerPoint slides with these verbal explanations. For example, one of her PowerPoint slides illustrated an advertisement's overall objectives (Image 19). Prof. M used simple headings on the left-hand slide after providing more verbal

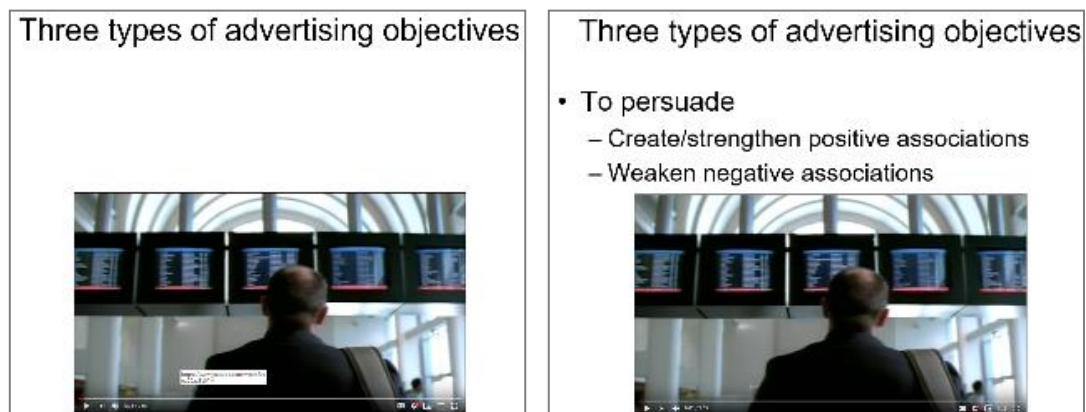


Image 19: A video embedded in a PowerPoint presentation to facilitate meaning-making.

explanations to guide her students through the meaning of each word. She used an animation effect on the right-hand slide to further elaborate on the word “persuade.” She purposely hid the answers on the left PowerPoint slide and guided her students to watch an embedded YouTube video. The students were then required to answer her question before she showed them the answers on the right-hand slide. In this example, Prof. M technically translated a textual definition of “persuade” into a digital representation through the use of images and a video embedded in her PowerPoint presentation. Prof. M facilitated her students' meaning-

making when they were asked to watch the American Airlines commercial “We Know Why You Fly.” The stories presented in the video gave the audience various reasons for flying and why they should choose to fly with American Airlines. The video itself denoted a rich cultural context that the audience could easily empathise with.

The transition from left to right in Image 19 provided the students with time to engage in self-reflection and gave them room for discussion. The marketing concept itself was cultural; therefore, it must address the needs of particular social groups to be effective. The video shown by Prof. M explicitly explained the American method for promoting businesses and also implicitly gave her students time to think about this cultural application. The majority of students in Prof. M’s class were Chinese; therefore, the video drove their discussion of marketing applicability, such as whether the American style of promotion works for a Chinese audience. When using Green’s 3D framework to deconstruct Prof. M’s pedagogical design, she was highly aware of the cultural content and able to present it using video to facilitate student learning.

Prof. M used PowerPoint to facilitate her classroom discussions. She verbally explained the advertisement theory with reference to her bullet points on the PowerPoint slides. Graphics were displayed on each slide to trigger her students’ reflections and generated further discussion. Prof. M also used several photos to illustrate the concept of several locations to facilitate her classroom discussions (Image 20). In contrast, the KitKat advertisement (Image 21) was printed on a bench and placed in a park. Although Prof. M may have originally selected



Image 20: Prof. M’s visual representation of unique locations.

the KitKat graphic only to illustrate the meaning of “unique locations,” the graphic itself carried meaning-making potential (Ledin & Machin, 2018), which gave the students more room for discussion. According to Ledin and Machin (2018), visual images may carry more than a

simple fixed meaning when applied in different contexts. The meaning representation of the KitKat graphic also carried a triple meaning because it helped Prof. M to teach her students to visualise the meaning of “unique location.” The graphic also addressed the effectiveness of an advertisement and how an advertisement can increase its impact with appropriate strategies placed at a unique



Image 21: Image used to teach marketing concept.

location with a unique slogan. With only one graphic, Prof. M made sense of the teaching concept and facilitated extensive class discussions. Although this approach technically transformed text into images, it also had a cultural application where the students were expected to relate daily accessible items, such as a park bench, to this creative advertisement. However, it was uncommon for advertisements to be printed on park benches in Hong Kong because advertisements were forbidden in the parks, which are government property. Therefore, the KitKat graphic (Image 21) referred to a very culturally specific situation, which extended the action of Prof. M’s technical transformation of learning materials from text to images. From Green’s perspective, the use of the graphic itself had rich social implications. While Prof. M used simple PowerPoint slides in her teaching practice, the graphics and videos embedded in these slides provided sufficient opportunities for her students to interact with each other during her classes.

2. Dr. E Used Videos to Support Her Students’ Learning About Abstract Concepts

Dr. E produced her own GoAnimate video to explain an abstract concept. She believed that animations could effectively help her students to understand business concepts. In the following interview excerpt, she explained how her approach shifted from a normal teaching method using show-and-tell text-based definitions to another method using multimodalities to represent a simple text-based definition (i.e., agglomeration economies), which helped her students to create meaning through new learning technologies in connection with a familiar cultural context.

I used a video to explain the concept of agglomeration economies, which is about business clustering. If you just read it or explain it, it is hard for students to imagine the concept. But when they watch the video, they can actually see how these economies are applied to real estate. I used animation with a voice-over and animated graphics in the video. I gave them real-world examples, such as the sneaker street and the flower market. Even if the students have not been to these places, they can understand the concept from the (animated) examples. (T2)

The flower market and sneaker street mentioned by Dr. E are local cultural elements in Hong Kong. These very unique Hong Kong business models reflect the accumulation of clusters of similar businesses in the same area. Therefore, when people want to buy flowers, they visit an area of mostly flower shops referred to as the “flower market” by residents. The same idea can be applied to shoes, where more than 50 shops selling sports shoes are clustered in an area normally referred to as “sneaker street.” By showing real-world examples in her video, Dr. E’s students easily understood the concept of agglomeration economies.

Green (2012) argued that one “learns not only through what is said via a subject but also what is not said ... learning a subject inevitably involves being socialized into the subject” (p. 6). The incorporation of readily available local examples into Dr. E’s video served the purpose of explicitly bringing out these “what is not said” elements and visually explained the meaning of agglomeration economics to her students. Therefore, Dr. E used a visual tool to conserve her teaching time and improve her students’ level of understanding.

When I started explaining agglomeration economies, I might have needed 30 minutes to explain the concept in the past, but now I only need 10 minutes after using the video examples. (T2)

Dr. E asked her students to watch the video before class and she followed up with more in-class explanations. Both interviewed students welcomed the idea to use videos to explain the abstract concept and they confirmed that this method helped their learning.

3. Dr. J’s Approach to Using Animated Movies for Learning Strategic Concepts

Dr. J also produced her own videos to support her teaching practice, primarily using GoAnimate. In addition to her normal PowerPoint presentations, she translated a text-based case study into an animated story using GoAnimate.

When I tried to explain a complicated organisational behaviour theory, I played a video and then I asked the students to connect the case study in a 15-minute long video to some

theories instead of using a 30-page text-based case study. My students usually do not have the patience to read the text-based case study. (T3)

In her 10-minute video, Dr. J created nine characters to help her students visualise the different hierarchical positions in the hypothetical company. Each character's role was clearly illustrated with labels. Bell's (2001) early research into visual analysis stressed the difficulty for observers to remain neutral when seeing images because their judgement can be influenced through representations of gender, roles, and the setting and size of images. Bell's suggestions were consistent with Green's (2012) cultural dimension and Kress (2003), who suggested that meaning-making was closely associated with social semiotics.

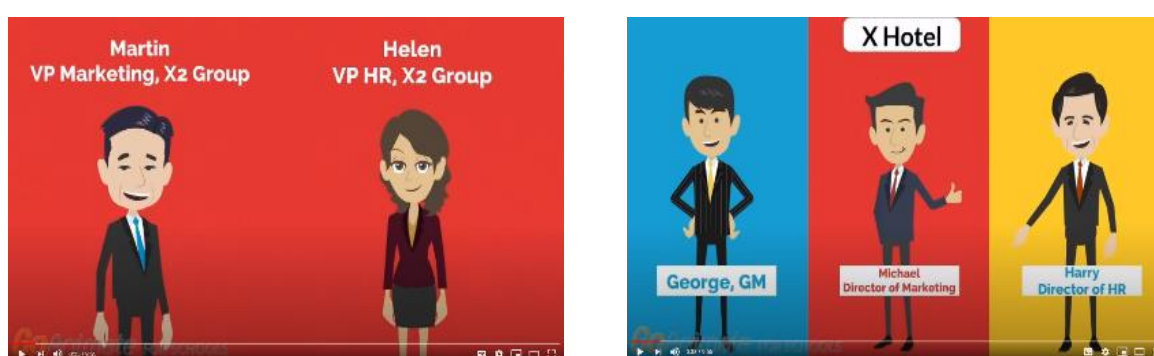


Image 22: Dr. J's characters representation (considered age, gender, race)

In the above character representations (Images 22), Dr. J has given very careful consideration to creating the equal presence of characters in terms of their gender, race, and age. Dr. J designed the size of the characters which show on the left of image 22 with higher hierarchy to be comparatively bigger than the main characters on the right of Image 22.

Dr. J was also very aware of her students' viewing behaviours and attempted to remain neutral at the production level by constructing visual images that she believed would be objective and would not affect her students' opinions. She incorporated Green's (2012) cultural and critical dimensions into her video design and used diverse backgrounds and storytelling techniques to translate the case study. In one of Dr. J's examples, she designed an elevator scene to illustrate a conversation between the general manager and the human resources director (Image 23). The text of their exact conversation was displayed in the centre of the image. Dr. J also used voice-over audio to read the exact text shown in the image. Machin (2007) suggested that the use of certain backgrounds and characters could be used to project certain meanings. The main message delivered in Image 23 was that the general manager planned to cut a few supervisory

positions and informally discussed the issue with the human resources director in the elevator. This scenario indicated that the leader was providing the senior manager with unofficial instructions. The design of an elevator background explicitly implied that the general manager's message was not yet final, there was room for negotiation, and the director of human resources was responsible for following up on the general manager's informal recommendation. In this scene, the human resources director appeared to be under pressure to



Image 23: Elevator conversation

cut supervisory positions.

Machin (2007) suggested that images always mean something to observers and argued that “there is no neutral documentation” (p. 24). Therefore, meaning-making activities using these images involved Dr. J’s choices and her students’ interpretations. As an educator, Dr. J knew that not all company decisions were made at formal meetings and senior personnel commonly lobby their colleagues in a casual setting. Therefore, Dr. J used a casual elevator environment to show how the general manager was managing the human resources director’s expectations.

Under Green’s 3D framework, Dr. J’s choices of scene and characters were highly cultural and critical. They were cultural in the sense that Dr. J explicitly projected an informal company practice to her students. They were critical in the sense that Dr. J wanted her students to think critically about the hidden meaning of the general manager’s message, the implications for the human resources director, and how these business decisions were made in a casual setting.

These visual analysis data were consistent with Dr. J’s adoption of GoAnimate software to create a video in her pedagogical design.

Usually, it is not a video just repeating the explanations in my lecture. It is a story with hidden messages. Therefore, I can ask my students, what did you see in the video? What was simple aspects of this company's culture did you observe? What kind of culture does the company have? (T3)

Dr. J used storytelling in her teaching practice because she was a strong believer that using images to support a story could help reflect the reality of discussed situations. In the company barbecue represented in Image 24, all of the characters were purposely designed to be wearing a blue company T-shirt. The barbecue itself represented the company's culture and wearing shirts with the same colour shirt sent a hidden message to Dr. J's



Image 24: Company Picnic

students. Dr. J expected her students to understand the meaning of organisational culture through their interpretation of the characters all wearing the same blue T-shirt.

I think that they will remember that story much better than any words. They will remember that there was a company barbecue in my story. Stories help to explain things and abstract concepts become clearer. (T3)

For example, I tried to explain organisational culture, which is a very abstract concept for college students. What do we mean by culture? Is it ritual behaviour? My explanations of certain organisational behaviours were very boring for my students. (T3)

Dr. J also asked her students to produce their own video using GoAnimate. By turning her students into producers, Dr. J believed that they could learn to apply theories through the video-making process and also learn video-editing skills.

I also asked my students to tell me a story from their internship experiences. I wanted to kind of force them to visualise their experiences. Therefore, I asked them to make an animated video. (T3)

Not all of the educators' technological adoptions were successful. Sometimes the educators were uncertain about their students' preferences and they made errors in judgement when adopting certain learning technologies. In this case, Dr. J expected good responses from her students when she gave them the opportunity to produce their own videos. Following bad feedback from her students, she abandoned the GoAnimate project after only one attempt to introduce storytelling skills to her students.

After one year of trying, I gave up on asking my students to create a video. I expected them to be interested in GoAnimate video-making, but it turned out that some students really did not think they could be creative in this way. They were a bit scared by the things I asked them to do. I think GoAnimate is an easy enough tool. I learned to use it in 1 hour. It is very easy to use. I must say that because I am interested in film editing, I can think of several tricks to create certain visual effects. But not everyone is like me. I should not assume that my students were similar to me. It turned out that not all of the students enjoyed the GoAnimate process. I received a lot of complaints saying that it was too much work. (T3)

Dr. J explained that the technical tasks and time involved constrained her students, who did not want to produce their own learning materials.

It was probably the technical and time-consuming aspects that scared them a little. I think some students understood what I was trying to do and they were the ones who actually made the videos. I don't think the students actually spent an equal time making their videos. It was always one or two members of the student team who were more interested in the creative project. For other students, it was just too much work. These students probably would prefer to write down a story about their internship experience. When I asked them to make their story into a script and then create it visually, maybe that was too much work. (T3)

Dr. J strongly believed that creating animated videos was a good learning tool and that if her students were to make their own videos, they would benefit even more from the learning technology. However, the above interview excerpts showed that Dr. J negotiated her identity as an educator and decided to abandon this teaching method when she noticed that her students were not willing to make an effort. This example demonstrated how Dr. J exercised her sensitivity and flexibility to amend her teaching process quickly when things did not work out as planned.

In the next section, I compare the different pedagogical designs that the studied educators adopted for their teaching. I supplement my interpretation with student feedback.

4. Different Approaches to Pedagogical Design

Next, I used Green's (2012) cultural dimension to compare the three educators' approaches. In addition to their self-awareness of social interaction factors among their students, these three educators could be differentiated based on the cultural applications of their pedagogical designs, which considered their students' social engagements and the affordances of different multimodalities.

Following the above discussion, Prof. M was aware that marketing concepts are culturally specific. She tactfully used the example of American Airlines to facilitate in-class discussions

within a Chinese-dominant group. At this stage of my thesis study, I could not be certain about the extent to which Prof. M referred to cultural elements in her classes to help her students understand the concept of “advertisements,” at least Prof. M had mentioned these cultural differences.

In contrast, Dr. E’s use of the flower street and sneaker street examples in her video demonstrated that she understood her students’ needs. She was aware of the affordances of multimodalities and decided to use a visual approach to illustrate the abstract concept of agglomeration economies. She changed her pedagogical approach from verbal explanations to watching videos, which effectively reduced the time needed to provide an explanation. Time was not a concern for her students, but they appreciated the extra time for reflection, which helped them to confirm their understanding of certain concepts. Student A reflected that the educator’s follow-up questions helped them to think more deeply about abstract concepts after watching the video. Student B also confirmed that watching videos before attending classes helped him understand the discussion of abstract concepts in the classroom.

In my thesis study, Dr. J was the most experienced educator because of her awareness of the characteristics of her students’ social interactions. She modified her pedagogical designs from a text-based case study to a story-based animation in response to her students’ needs. She was able to use the GoAnimate software to present her case study using a storytelling process instead of texts to incorporate the implicit meaning of the case study, which she intended her students to discover during their discussion and self-reflection. Overall, all three educators addressed their students’ social interactions to varying degrees in their pedagogical design.

From the students’ perspective, they acknowledged the importance of knowing that these digital materials were self-produced by their educator. Student A commented that she knew that Dr. J created her own cases and made the animation herself. Therefore, Student A paid more attention in class because she knew that she would not be able to find the answers to Dr. J’s case study online or in a textbook.

In this section, I used these three educators’ teaching artefacts to illustrate their different teaching digital pedagogical approaches based on the cultural lens of Green’s (2012) 3D model. My visual analyses of Prof. M’s PowerPoint slides, Dr. E’s video, and Dr. J’s storytelling animation video showcased that all these educators were highly aware of the meanings that

their students could generate from the different multimodalities. The educators were also sensitive to their students' learning preferences and made good use of their digital choices to interact with their students in the right place at the right time.

C. Pedagogical Planning—Exploration Through a Critical Lens

1. Prof. M's Critical Applications

Prof. M stressed the importance of verbal explanations using a visual tool (PowerPoint).

Even if they read my slides, they probably don't know what I am talking about. I tend to use more verbal examples, which is more efficient than just asking them to read a case study. (T1)

Prof. M was aware of the importance of co-ordinating her visual teaching tools with verbal discussions; however, she increased the dominant role of her verbal commentaries and reduced the meaning and function of her PowerPoint slides in the classroom.

I interpreted the simultaneous relationship between Prof. M's commentaries and PowerPoint slides and how learning technologies played a role in the students' meaning-making process using Image 25 as an example PowerPoint slide. Prof. M used an animation effect to show the questions at the top first. After asking her students to think about these three questions, she

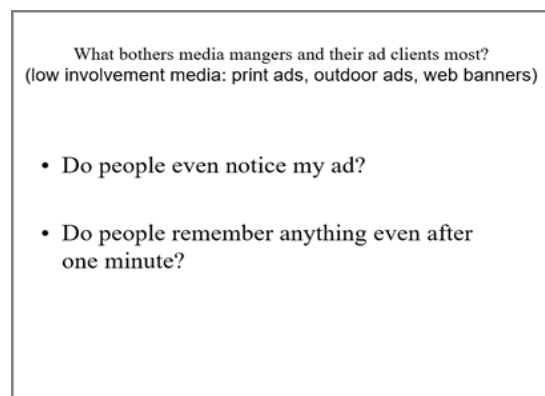


Image 25: Use PowerPoint as a tool to control teaching flow.

collected their instant feedback and then pressed her presenter button to show the answers on the same page. Although all these texts appeared on the same page, the PowerPoint animation effect controlled the timing of the appearance of certain texts. Her pedagogical design could be explained using Green's operational dimension; that is, Prof. M used multimodalities to create meaning from plain text. However, the operational dimension is also reflected in Prof. M's

critical decision about how this animation application could help her students learn abstract concepts. Prof. M's adoption of PowerPoint could be interpreted as an operational action which was determined by her critical decision.

Learning technologies do not merely play a simple role in displaying texts in this example; instead, the PowerPoint slides served multiple functions, such as directing the flow of Prof. M's presentation, drawing students' attention using an animation effect, directing their thoughts to the questions on the slides, and supporting their understanding of Prof. M's commentaries after viewing the slide. In his research on bullet lists and commentaries, Schnettler (2012) concluded that PowerPoint presentations serve "translating" and "conducting attention" (p. 167) purposes. Prof. M's pedagogical design confirmed this finding, which could be extended to further learning technology functions in slide presentations.

The critical dimension was a reflective part of the 3D model proposed by Green (2012). Although Prof. M may seem to dominate the flow of her PowerPoint presentation as an educator who held a dominant position while teaching as described by Comber (2016), she actually attempted to make room for her students' own production of learning in a spatio-temporal sense using different multimodal means:

I usually start with a closely related example that illustrates a theory that my students can think about. Sometimes I ask them to do a simple experiment and then show them the results, which are sometimes surprising. I introduce the theory on the PowerPoint slides. I show more examples which I ask the students to discuss, but of course I do not just show everything all together on the slides. (T1)

Green (2012) suggested that in addition to allowing individuals the opportunity to make meaning through social interactions, which is the cultural perspective that I discuss in Chapter 4, the opportunities that individuals "are given [that provide] more critical insight into the processes and possibilities of knowledge production, their own and that of the culture" (p. 7) are very important in the learning process. According to Prof. M's explanations, she switched her teaching sequences by either teaching a theory, showing an example, and asking students to discuss the example, or by teaching a theory, discussing the theory, and providing an example. She provided opportunities for her students to interact and produce their own knowledge. According to Green (2012), this pedagogical approach itself is critical because it enables the "individual not simply to participate but also to transform and actively produce it" (p. 7).

When asking students to reflect on their preference for PowerPoint presentations, the students quoted below had different responses. Student A reported that she enjoyed using digital devices in her learning and preferred to use an iPad and a MacBook to read PowerPoint presentations and watch videos. In contrast, Student B was a “traditional” learner who described himself as more reliant on learning from paper materials and indicated that he was easily distracted while reading learning materials online. Although he said that he has no problem using digital devices, he continued to rely on paper and handwriting as his natural learning mode.

Student A commented that she did not like to have entire lectures presented through PowerPoint slides because she lost her focus easily. She emphasised that educators should simply make a list of all the important points, explain them, and allow time for students to reflect on these points through class discussions. Although Student B considered himself as a traditional paper-based learner, he commented that he expected PowerPoint slides to be well designed and not overly text-dense.

Both students confirmed that Prof. M’s PowerPoint designs were effective because she put thought into her PowerPoint designs, as shown by their proper layouts, wording placement, and provision of sufficient interactive elements through PowerPoint transition effects and embedded YouTube videos.

Vasquez (2017) considered teaching practices such as learners becoming active producers as enhancing students’ critical literacy learning facilities. Green (2012) suggested that all teaching practices were transformational. Prof. M’s example demonstrated her intention to involve students in the knowledge production process because she required students to do group presentations and expected them to be able to explain their ideas instead of simply reading out PowerPoint slides. The following interview excerpts demonstrated how Prof. M expected her students to learn and create their own ideas through group presentations.

If students use PowerPoint slides, they must talk me through the slides. I used the same standards; therefore, I asked them not to put too many words on the slides and they must walk me through the slides other than just showing the slides and then reading them. (T1)

The group project is more like coming up with one interesting idea, but then learning from each other, challenging each other, and collaborating with each other. Therefore, group projects are more collaborative to get a good result. (T1)

Prof. M was also aware of PowerPoint's affordances. She mentioned that she tended not to put too many words on her PowerPoint slides and that she preferred her students to follow her example instead reading slides or staring at the screen. This action indicated her intention to control the flow of her teaching and improve her time management in accordance with her belief that her verbal explanations helped her students to understand abstract concepts better than PowerPoint slides alone. Prof. M's action was coherent with Ledin and Machin's (2018) discussion about the material basis of communication. Ledin and Machin (2018) suggested that different learning materials have "affordances that make them apt for some uses but not for others" (p. 19). Prof. M believed that PowerPoint slides could be a visual aid for explanations, but that her own verbal explanations were more important, which made her pedagogical approach critical in the sense that she preferred one medium over another and therefore her pedagogical decisions affected her choice to use fewer words in her PowerPoint slides and accompany them with verbal explanations.

2. Dr. E's Critical Application

In addition to using video to explain abstract concepts, Dr. E used videos to replace physical field trips when they were not possible. I worked with Dr. E; therefore, I knew her as an educator who cared greatly about her students' needs and feedback. She constantly conducted her own surveys to collect her students' feedback about the teaching tools she used in class. For instance, the following interview excerpt demonstrated her finding that her students actually liked the video.

I also conduct surveys that asked whether the videos could help my students to understand certain concepts. A lot of them agreed that these kinds of videos could actually help them to understand basic concepts. (T2)

Dr. E also knew what she wanted her students to learn and she actively searched for ways to deliver essential knowledge. She found a way to better explain abstract concepts outside the classroom setting:

I produced the micro-modules and these field trip videos because I really wanted my students to understand what I am trying to teach them. The concepts in this course are very abstract. Even if you have read the books, they are still very hard to understand. That's why I must give some things to my students to help them understand (the video field trip). (T2)

Dr. E used non-graded quizzes to check her students' viewing behaviour and ensure that her students participated in learning during classes. Based on these results, she then determined how to help her students if they did not watch the videos before class.

To see if they actually watched the video? I don't grade the quizzes, but I just want to check whether they watched the video or not. I put the video on Blackboard using Panopto; therefore, I already had the data showing who watched the video and who did not. (T2)

Dr. E's pedagogical approach was similar to Prof. M in that both educators had the power to decide what to teach and how to use different multimodality affordances to help their students understand abstract concepts in the classroom. However, their methods for allowing students to access and become involved in the co-production process were different. Prof. M tended to allow her students' discussion and generate learning through their interactions, whereas Dr. E involved students in the viewing process so that they could better understand abstract concepts and then supplemented the video with further explanations.

Dr. E wisely used videos to supplement her teaching practice. Her students' feedback confirmed that her digital pedagogical decisions fit her students' learning needs. As a tech-savvy video watcher, Student A preferred to avoid simply viewing PowerPoint slides. She stressed the necessity and importance of peer discussion after watching a video, which helped her to reflect on the discussed concepts. In contrast, the traditional learner, Student B, made similar comments. He did not enjoy watching videos because they failed to keep his attention and he preferred to have the educator repeat the abstract concepts in class even after watching a video together. Both students consistently indicated that they needed time for reflection together after watching a video. Dr. E produced videos that enhanced her teaching practice. She wisely required her students to watch videos before class and provided further elaboration and in-class discussions to strengthen her students' understanding and learning. Her choices of digital modalities were the result of her students' preferences and feedback.

3. Dr. J's Critical Application

Unlike the other two case study educators, Dr. J did not collect much feedback from her students and her pedagogical designs were based on her personal interests. However, Dr. J adopted the most technological tools in her teaching practice compared with the other two educators. She used a wide variety of self-produced videos, animation effects, and PowerPoint

slides for content delivery. She also used platforms such as Padlet, Kahoot!, Socrative, and Mural to facilitate class interactions and group discussions. Although she claimed to be relatively uninterested in her students' feedback on her pedagogical applications, she used uReply and CATME to collect their feedback.

I worked closely with Dr. J and knew that she was tech-savvy and had taught herself most of the newly available learning technologies. She was always enthusiastic about applying these new learning technologies in her classes. She had a high awareness of and practical experience with the affordances of most technology-related learning platforms and software applicable to her teaching practice. She was obviously very critical in both her pedagogical approach and selection of applicable multimodalities in her classes.

Although Dr. J claimed that she did not put much effort into understanding her students' needs and that her technological applications were chosen based on her personal interests, she was actually very aware of the importance of her students' interactions. The following interview excerpt demonstrated that she used Padlet to cleverly create better student interaction experiences in her classroom.

Padlet is more for group discussions, especially if I asked the group to come up with ideas or create a document. Usually, the output is that the students must finish a table and summarise something. I think that Padlet is more for real-time text-based discussions. Everyone can see the materials in the same space. (T3)

Dr. J addressed her students' preferences and made changes accordingly. She originally created an individual discussion area for different groups with different Padlet access links. However, after understanding the slight differences involved in using separate access links, Dr. J combined all the inputs from her students in the same Padlet platform to facilitate group discussions. Considering Green's critical dimension, Dr. J's decision-making process was closely connected to her high level of competency and capacity in adopting multimodality in her teaching practice. She critically made changes to suit her students' learning needs based on the affordances of different digital devices. From the Padlet example, she learned that the platform could be used to create live visuals for her students to discuss. With her high technological skills, Dr. J could smartly mobilise the different affordances of digital tools at various times and in different spaces in her teaching practice. In the following interview

excerpts, she demonstrated her digital ability to smartly manipulate the digital platforms to suit her teaching and students' learning needs.

They are time saving if they involve group discussion. If you have many in-class groups, you can usually only ask one or two groups to share their ideas. On Padlet, however, every group must give me something, even when there is probably no time available to talk. The students must at least write down something and put it on Padlet. (T3)

Sometimes I try different things, you know. Sometimes I think groups probably want to have their privacy. They don't want others to see their grades. I grade each group's Padlet, but it is time-consuming because I must create different Padlets before I go to class. And then I share with each group the URL of their respective Padlets. But I think that sometimes the students don't care because they probably want to see what's going on with other groups, especially if the activity is not graded, if it's just for discussion, right? No one gets a grade for that. Therefore, I also tried putting each group's ideas on the same Padlet. (T3)

Dr. J was fully aware of the functions of different interactive technological applications and used them wisely to serve different purposes in her teaching practice. She used Socrative to test her students' understanding of her lectures. She also understood that her students needed interaction and used Kahoot! and crossword puzzles to create a fun learning environment:

I use Kahoot! in all my courses. I use Kahoot! and Socrative. I think Socrative is better if I truly want to test their knowledge and Kahoot! is just for fun, to create a little bit of distraction. I also used online crossword puzzles. (T3)

Teaching practices shifted from face-to-face to online teaching during the COVID-19 pandemic. Dr. J indicated that she gave up some of the video exercises during the lockdowns that she would have normally used in her face-to-face teaching practice. Instead, she used more new stories, funny YouTube videos, and pictures to assist her teaching. Dr. J explained that she tried to replace classroom interactions with more entertaining content (e.g., YouTube videos, pictures, stories) and cut short her PowerPoint presentations. These differences between physical and online teaching modes obviously have had an impact on Dr. J's digital adoption decisions. She pointed out that in the online world, only a small number of students were active, while most remained quiet and hid behind the camera. She mentioned that she was unable to facilitate breakout room discussions effectively like she could in face-to-face learning contexts. Accordingly, she used other methods like simply asking questions instead of hosting a group discussion.

Using Green's critical lens to analyse Dr. J's work, it was not difficult to see her great expertise. Like the other two educators, she saw the "must-learn" perspective as being dominant. She

created and designed her technological applications to better deliver learning contents and helped her students learn more effectively. She also had a strong belief that her students learned better from a process of in-depth self-reflection. In her storytelling video discussed earlier in this chapter, for example, all of the scenes with different backgrounds were planned carefully and embedded with implicit meaning. Her students were expected to watch the video and understand the captions, including their implicit meanings, such as characters' relationships, the implications of the elevator conversation about the management situation, and meaning-making through Dr. J's different background designs. She expected these issues to be discussed and explored in detail.

Dr. J made critical pedagogical decisions by making an appropriate shift to digital means to suit her teaching practices during the pandemic. Student A admitted that she did not like online learning because she was alone behind the camera. When educators put students in Zoom breakout rooms, they tend not to turn on their cameras and most meeting members simply made no sound during the learning sessions. Therefore, Dr. J considered that online group discussions were less effective than face-to-face group discussions. The following interview excerpt demonstrated Dr. J's accurate observation of Zoom teaching and how she adjusted her adoption of digital pedagogies accordingly.

Only one small group of students were quite engaged and they tried their best to get a better participation score. ... but I would say that 60% to 70% of the students just disappeared. I mean, I saw their faces, but they did not talk, they didn't use the chat function. (T4)

I tried to use more examples, I tried to find new stories, funny YouTube videos, and pictures. I tried to use these things a bit more in my Zoom class, but the trade-off was that I did not have time to explain every PowerPoint slide.... The students probably needed a little more entertainment, a little fun. (T4)

I have used a critical lens in this section to demonstrate how all three case study educators planned their teaching practice. In the following section, I compared these three educators' critical approaches.

4. Critical Comparison of Three Educators

In the previous section, I discussed how individual educators' personal preferences for various digital tools and their teaching philosophies played out in their pedagogical planning and design process. The figured worlds at UHK as their supporting context doubtlessly influenced these educators' decisions, such as providing financial support for video production. However, their

adoption of UHK's support also relied heavily on their understanding of the affordances of various digital multimodalities and their relation to students' learning preferences. In my earlier discussion in Chapter 2, I mention that I wanted to explore the relationship between the learners and educators. Considering the active role played by learners as producers of their own learning practices, I wanted to understand how these educators exercised their "power" in their position as UHK educators and made their critical decisions in their pedagogical planning and designs.

All three educators used different levels of digital adaptation, from Prof. M's minimalist use of PowerPoint slides and Dr. E's video production using UHK's technical and financial support to Dr. J's self-produced animation video and multiple digital platforms. Although these educators had different levels of digital production capabilities, they were all fully aware of their students' needs and the appropriate pedagogical designs. Therefore, they could all plan their pedagogies based on the affordance of different digital means. The process of power negotiation between the educators and their students was obvious when looking at the case study of Dr. E. I discuss in Chapter 4 how Dr. E planned her video production. She reflected that she conducted surveys and collected her students' feedback on her videos and she fine-tuned her class timing to play her video to best serve her explanation of abstract concepts. In this way, Dr. E cautiously addressed her students' needs and her decision-making process was predominantly iterative. In Dr. E's case, the cultural dimension played out simultaneously with the critical dimension.

Although Prof. M was a minimalist who used only PowerPoint slides with embedded YouTube videos in her classes, she basically dominated her own decision-making process. During our interviews, she did not mention her students' involvement in her decision-making process nor did she revise her teaching mode during the pandemic. Prof. M was very confident about what her students must learn and how she wanted her in-class delivery to flow. She took a comparatively dominant position in the entire decision-making process and operationalised her pedagogical decisions through manipulating PowerPoint slide designs and transitions. In Prof. M's case, Green's critical lens played an important role in her planning and decision-making.

Dr. J was the most tech-savvy educator compared to the other two case study educators. She held strong beliefs about how best to help her students learn. She considered storytelling to be the best way to help her students understand the complex business world. She had the skills to

make an animated video and she strongly believed that her students' interactions and discussions were both essential items in her teaching practice. Her adoption of digital platforms and video production were mainly her own pedagogical decisions. Despite her strong beliefs about the best digital pedagogies and designs, Dr. J did not make her decisions purely based on self-interest, as she claimed. The examples I cite in Chapters 4 and 5 demonstrate that Dr. J made her decisions based on trial and error. When she realised that the use of various tools for instant animation video did not work in the online setting, she abandoned one digital tool and automatically shifted to another platform and used a new tool. Although she claimed that her decision-making process was mainly guided by her own preferences, she in fact decided to fine-tune and modify her teaching means based on her students' learning capabilities and effectiveness. In itself, I considered her decision-making process as a power negotiation process. Dr. J was more reflexive and made critical decisions more quickly than the other two educators.

In the next section, I discussed how the educators' personal beliefs, value, and positioning played out in their overall digital pedagogy planning and design process.

D. Chapter Summary

In this chapter, I explain how the three educators' digital designs were operationalised through operational, cultural, and cultural lenses. I also discuss the importance of the educators' identity in their decision-making process and address how the three educators' self-identity and positional identity influenced their selection of digital tools and pedagogical decisions. In the next chapter, I provide my conclusions based on this study's four research questions. In addition, I describe the applications of this thesis study and explain how my findings provided a foundation for future research.

CHAPTER 6: CONCLUSION

In this chapter, I summarise the results of my study of how university-level business educators planned and thought about digital forms of teaching to meet the needs of the next generation of students. I presented my proposed visual representation of the 3D model and explained how I have modified the original simple visual image.

In this chapter, I highlight the metaphor of “new wine in new bottles” as a model of evolution. I then discuss the latest findings regarding the key role played by the critical dimension of the 3D model.

I also discuss the limitations of my research methods and suggest some directions for further research. I conclude this chapter by discussing the implications of my thesis study for researchers, educators, and academic policymakers.

A. A New Visual Representation of the 3D Model

Moving away from the typical research direction, namely understanding educators’ motivation to use digital tools and their affordances, I focused on three educators’ multimodal and digital applications, their design choices, and how they planned their digital pedagogies.

In my literature review, I note that the 3D model was comparatively flexible and offered a generative and participatory method for exploring multiliteracies in a subject-specific context, namely business studies. I adopted the simple visual representation of Green’s (2012) 3D model (Image 26), which theorised the use of operational, cultural, and critical dimensions to understand digital literacy, as the guiding framework for my thesis study. Throughout the data analysis process, I showed that the three case study educators planned and made very different digital decisions in their teaching practice, despite working within the same business school at the same university. Therefore, it was crucial for me to better understand the concept of educators’ identity and these educators’ university context. I realised that I needed a supplementary concept to further explain the cultural and critical dimensions proposed by Green (2012).

As a result, I used the identity theory proposed by Holland et al. (1998) to further explain these educators’ digital pedagogical choices and decisions. Their concept of figured worlds (Holland et al., 1998) was focused on the non-static nature of social interactions and how educator identities were formed and reformed in the process of interaction. This concept was important

for my thesis study because I was able to use it to further explain the critical dimension in the 3D framework. In this study, I observed that all three educators adopted quite different multimodal means in their teaching practice; however, they all taught in the same business school at the same university. Using the figured worlds at UHK where these educators were situated allowed me to further expand my interpretation of the complexity of these educators' pedagogical decisions. Therefore, I was able to better elucidate the cultural dimension of the 3D model.

The critical dimension played a dominant role in the 3D model. Specifically, this dimension stood out from the other two dimensions and played a leading role in educators' pedagogical decisions. However, this finding was inconsistent with Green's (2012) original recommendation to look at the simultaneous relationships in the 3D model and differed from researchers, such as Nixon and Kerin (2012) and O'Mara (2012), who operationalised the 3D model without prioritising one of its operational, cultural, and critical dimensions. In addition, my results revealed that the three educators played a dominant role in their digital pedagogical decision-making.

I proposed a new visual representation of the 3D model with the central concepts of figured worlds and educator identity. This new visual representation (Image 26) could be used in future studies as an actualisation tool to understand multiliteracies and digital pedagogical planning and design in higher education business schools. I placed the critical dimension at the top of the proposed visual

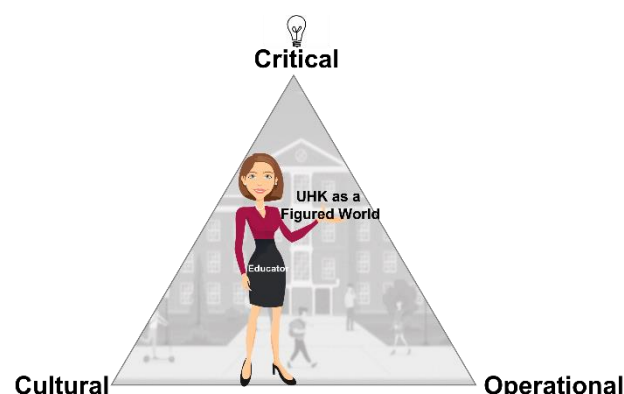


Image 26: New visual representation of the 3D model (my own drawing)

representation to indicate the importance of focusing on these three strata in the pedagogical planning and design process. The results of my thesis study have shown that these critical strata were more dominant at the level of teaching practices than elsewhere, although the three dimensions are said to be “bounded up together, and inform and reinforced each other” (Green, 2012b, p. 177). I proposed a new visual representation to translate this conceptual model and help other researchers to adopt this new perspective.

B. Evolution of New Wine in New Bottles

At the initial stage of this thesis study, I was interested in understanding how these three participating educators working in the same teaching context (UHK) had different teaching philosophies and preferences for adopting digital tools. I produced profiles of these educators to better understand their pedagogies in Appendices 1, 2, and 3 as one-page visual images. I also included my own profile (Appendix 4) to enable the readers of my thesis to better understand my interpretive lens and determine its suitability for their own research from their own interpretive lenses to understand the data introduced in Chapters 4 and 5.

In interpreting the operational dimension proposed in Green's 3D model, it was encouraging to observe that the three focal educators had all moved away from text-based teaching during the COVID-19 pandemic. They all understood how to use different multimodalities, such as sounds and images in videos, websites, and animated videos. Nevertheless, the three educators adopted different forms of digital teaching practices ranging from simply using PowerPoint slides to creating complex storytelling videos using animation software. I show in Chapters 4 and 5 that the three educators' digital adaptations had moved away from the "old wine in new bottles" paradigm. These educators showed that they had moved from the text-dominated pedagogical era into a multimodal world.

My detailed analyses in Chapters 4 and 5 demonstrate that these three educators were aware of how to use different multimodalities to create meaning representations and they could operationalise various digital tools in the context of teaching different subjects. Their technological capacity did not seem to be a barrier to their process of adapting to new learning technologies. Dr. E did not know how to make videos; therefore, she obtained funding and technical support resources from UHK to help her. Dr. J was tech-savvy in terms of making movies and did not require technical support, but she used UHK's funding resources to purchase the GoAnimate software to make her animated videos. Prof. M was a minimalist who only used PowerPoint slides with embedded YouTube videos and images. Although her PowerPoint slides were generally text-based, Prof. M used PowerPoint's animation functions to include images and YouTube videos to control her flow of teaching and facilitate in-class discussions.

During my thesis study, I noted the possibility that online teaching modes may have changed the case study educators' digital pedagogical decisions. Therefore, I conducted follow-up

interviews with two students and the three educators to better understand these changes during the COVID-19 pandemic. However, Prof. M resigned during the pandemic period, and I was unable to get in touch with her. Both Drs J and E indicated that their previously produced digital teaching materials were still useful, although the timing for teaching these materials online differed from the original timing in face-to-face teaching. Both educators repurposed watching videos as a pre-class activity and instead focused on online discussions in relation to the video contents during the pandemic. The interviewed students admitted that they did not pay attention to the video when they were asked to watch it during online classes. However, they were willing to participate in the related online discussions. Two educators decided to change the mode of video delivery, which appeared to be an adequate response to their students' learning needs.

The results from my follow-up interviews revealed that the three case study educators' developed digital materials were still relevant and useful in both face-to-face and online teaching modes. I also demonstrated that these educators were highly capable and flexible in their adoption of digital pedagogies and successfully transitioned from the pre-pandemic text-dominant pedagogical era into the post-pandemic multimodal world. I provided evidence that these three educators had already mastered the skills needed to transform their text-based teaching practice into a multimodal teaching practice. Furthermore, multimodalities did not necessarily involve high-tech methods, such as the animation video Dr. J developed. Multimodality applications also included simple tools like Prof. M's PowerPoint slides with the appropriate use of images, audio, text, and slide transitions. My thesis study findings did not suggest a "best" digital tool. My results suggested that the educators were capable to make the best use of multimodalities in their pedagogical approaches using appropriate space at the right time.

C. Importance of the Critical Dimension in 3D Model

In my thesis study, I found Green's 3D model to be very helpful. The model itself offered a simple framework using operational, cultural, and critical dimensions to explore digital transformation of educational practices from a more holistic perspective. Green's 3D model was fundamentally conceptual with its interrelated dimensions simultaneously and equally playing against each other. In my thesis study, however, I analysed the participants' teaching artefacts, interview excerpts, and students' feedback, and found that these three dimensions

could be operationalised and functioned with different priorities. I used the visual analysis tools recommended by Ledin and Machin (2018) in addition to the figured worlds theory proposed by Holland et al. (1998) and the concept of multimodality and found that Green's 3D model was well connected to these two concepts and could be operationalised instead of merely serving as a conceptual framework.

While operationalising my study focus using the case study educators' decision-making perspectives, I observed that the critical dimension linked to teachers' power in making multimodal digital pedagogical choices played a dominant role in its interaction with the operational and cultural dimensions. The educators' identities and use of multimodalities were both strongly linked to the critical dimension, which helped to drive their adoption of digital tools and applications. Unlike Beavis (2012) and Faulkner et al. (2012), who suggested that these three dimensions worked interdependently, I demonstrated the connectivity between multimodalities, educators' identities, and the critical dimension. I also suggested that the critical dimension was the most important in the 3D model and that this dimension should be addressed with caution before making operational decisions in the pedagogical planning process in university-level business teaching. Unlike the New London Group (Cazden et al., 1996) and Lankshear and Knobel (2006), who considered 'critical' as an endeavour to empower students to think critically, this study addresses 'critical' differently, examining how educators' decision-making and negotiation of their identities in the same university context affect their adoption of multimodal approaches in their teaching.

Green's (2012) 3D model was previously used as a conceptual framework in multiliteracy studies (Nixon & Kerin, 2012; O'Mara, 2012). In my thesis study, I illustrated its practical potential for collaborative support based on the use of multimodalities, educators' identities, and visual analysis tools. The application of the 3D model was not limited to literacy studies but could be used to understand how learning technologies were employed in business education at the university level. In this thesis study, I showed that the 3D model was very flexible and applicable in a wide range of research areas. The teaching artefacts and interview excerpts presented in Chapters 4 and 5 demonstrate the practicability of the 3D framework. For example, it could be used as a heuristic tool to explain the different ways that university educators use their identities as educators. I also suggested that educators explicitly use the 3D model's critical lens.

D. Study Limitations

The data I collected for this study were obtained from three educators who teach at the same university. Therefore, my sample size was relatively small. Although I attempted to include diverse business subjects, my findings reflected the voices of a single business faculty and could not be generalised to represent a larger population. Future studies could cover more educators from different faculties or universities. Although I conducted my thesis study during the COVID-19 pandemic, my interview questions focused on the overall picture of digital adoption as it applied to the educators' face-to-face teaching environment. I asked follow-up questions to determine whether the educators used different approaches when comparing teaching modes before and during the pandemic, these questions were not my main focus in this study. Future studies could further explore different digital approaches to teaching modes.

I used a multiliteracy approach to present the possibility of understanding the digital pedagogies of business teaching at the university level. However, there is still a large research gap in digital pedagogies and digital teaching in business studies. More research should be conducted into these areas in the future.

E. Implications for Digital Pedagogies in Higher Education Business Teaching

1. University/Faculty Level

I found that regardless of their digital competency level, the three educators were willing and able to choose suitable digital tools for their business subjects. The educators may or may not require technical support to create new digital teaching materials, but financial support was always an incentive that helped motivate their continued innovations in teaching materials. These three educators have moved from traditional text-based teaching to digitally based teaching practices with a focus on facilitating their students' interactions during classes. Accordingly, universities should continue to introduce new digital tools and conduct the necessary workshops to update their educators on relevant trends.

It is important that universities should become aware of their own "figured worlds," that is, the contexts within which the educators teach. UHK was situated at the centre of my visual representation; therefore, university policymakers should become fully aware of the impact of their policies on educators and support their digital pedagogy planning and design. Although

the three educators relied heavily on university/faculty support, they all had unique identities and required various levels of support. I found that universities and faculties should offer diversified supports to meet the unique needs of different educators.

2. Educators

This study demonstrates the relevance and multidisciplinary capability of the 3D model for in-depth exploration of digital pedagogies in business studies. University teachers of business studies are subject experts, but they do not necessarily have the skills to produce advanced digital teaching materials. This study demonstrates that digital pedagogies do not necessarily have to feature high-level technical productions such as video animation or VR. Simple multimodal designs such as PowerPoint slides are also suitable if teachers incorporate affordance and materiality of multimodes in their planning and designing process.

This study showcases how practitioners can operationalise the 3D model by embracing all of its technical, cultural and critical dimensions. Business studies teachers should assess and adjust their use of multimodalities through constant self-reflection and student feedback. Teachers naturally have their own preferred digital tools. However, they should be aware of how each new generation learns most effectively and provide students with opportunities to create meaning from visual images, audio and textual tools with digital technologies.

This study shows that educators hold a dominant position, with the power to shape and control their multimodal choices in the digital pedagogical design and planning process. It is therefore crucial for practitioners to be aware of this fact, take ethical actions, and adapt their teaching materials multimodally by considering relevant digital designs. If their own technical capabilities are limited, they should request appropriate assistance from other professionals.

This study also raises the significance of temporal and spatial factors when planning digital pedagogies. It is very important that practitioners use digital approaches at the right time and in the right place in both online and offline teaching environments.

3. Researchers

In this study, I outline an innovative approach to understanding digital pedagogies in business studies, particularly at the university level, using Green's (2012) 3D model. By anchoring

multiliteracies, university cultural contexts and participants' identities to the 3D model, I demonstrate a potential way to operationalise a conceptual 3D model, noting the key role of the critical dimension in Green's 3D model. I provide solid practical examples of multimodal analysis of business study teaching.

The new visual representation I have developed (image 4 on page 55) enables researchers to use the original 3D model with three dimensions to connect with the figured worlds at their institution and to educators' identities. In this representation, the operational, cultural and critical strata are purposely positioned in the outside layer of the image, and the university context and the teacher avatar are in the centre, indicating the connection between the figured world and the 3D model. With its emphasis on the explicit outputs of multimodal pedagogy and its connectivity to teacher identity, this new representation provides an inside-out, holistic approach to understanding multiliteracies.

This new visualisation is a stronger operationalised version of the original simplified 3D model. It helps to explain the explicit outputs of digital pedagogy and its connection to teachers' identities, the core influences that shape and control teachers' multimodal choices of material. This study was conducted in a same university context where teachers negotiate their identities within a shared set of rules and institutional values. Future studies could further explore this inside-out approach to understand how different identities play out in different university contexts.

Unlike the existing literature, which examines the critical dimension from learners' perspectives, in this study I suggest that the critical dimension in the 3D model is concerned with teachers' power and their multimodal choices in the decision-making process. The importance I place on the critical strata is also different to the original Green (2012) model, which suggested that researchers consider all three strata simultaneously without priority. This study challenges researchers to rethink the relationship between the three strata in the 3D model. As technology and digital pedagogy are ever-evolving, this study encourages researchers to assess how higher education teachers design their material multimodally by using the 3D model, supplementing it with figured world concepts to obtain a holistic understanding of multiliteracy development.

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Appendix 1: Profile of Prof. M



PROFILE

Research interests include: consumer usage experience with high-technology products and services, digital marketing (mobile phone, video games, online social network), branding, econometric modelling and empirical Industrial organisation.

AWARDS

Won many faculty and university teaching awards

TEACHING AREAS

Marketing Management (2000 level course)

New Product Management (4000 level course)

TEACHING EXPERIENCE

5 years teaching experience with no professional teachers training background

PROF. M

Assistant Professor

TEACHING PHILOSOPHY

Uses mainly PowerPoint slides to teach her Marketing course for undergraduate freshmen. Uses Blackboard as learning materials posting platform. Sees PowerPoint slides as a tool to guide her teaching flow in class. Uses mainly bullet points in her PowerPoint slides and occasionally adds graphics and videos to help explain certain concepts. Also provides examples and tells stories verbally, without using slides. Thinks that university learning should extend students' critical thinking through classroom Q&A, instead of reading and making notes from PowerPoint slides.

ASSESSMENT METHOD USED

Uses group project to assess students' capabilities in applying the taught concepts and team collaboration. Asks questions after oral presentation to check students' understanding and contribution to group project discussion and preparation.

FEEDBACK

Uses teaching tools based on own experience. As no negative feedback provided by students, sees no needs to modify her teaching tools.

MULTIMODALITIES USAGE IN CLASS

Blackboard	100%
Sharedrive	100%
WhatsApp	30%
Zoom	100%
Youtube...	60%
PPTs	100%

Appendix 2: Profile of Dr. E



PROFILE

Research interests include:
Real Estate Economics
Commercial Real Estate
Asset Pricing
Behavioral Economics
Land Supply Urban Renewal

AWARDS

Won a few faculty teaching awards

TEACHING AREAS

Hospitality Real Estate
Economics
(3000 level)

Shopping Mall Investment and
Management
(3000 level)

Real Estate Valuation
(4000 level)

TEACHING EXPERIENCE

6 years' teaching experience
with 3 years' working
experience in the real estate
industry.

DR. E

L e c t u r e r

TEACHING PHILOSOPHY

Believes that video and VR are effective learning tools to help explaining abstract real estate concepts. Besides using PowerPoint slides, develops and produces many short videos (animation demonstration) and VR videos (virtual tour) for her courses. Fully utilises different learning management tools (Blackboard, Panopto) to allow students to download learning materials and videos. Uses sharing tools (WhatsApp, Sharedrive) for file sharing and communication. Uses interactive tools like Kahoot for class interaction. Passionate and determined to help students understand abstract concepts. Prefers face-to-face teaching over Zoom.

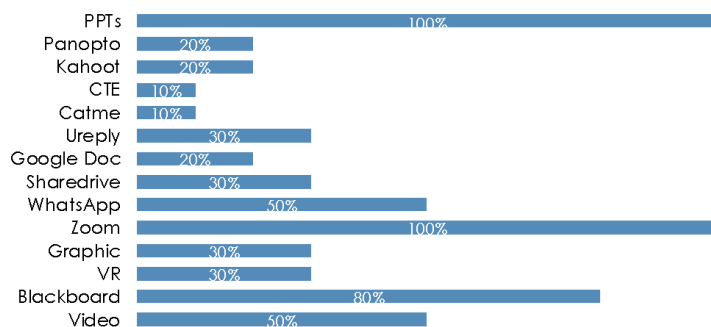
ASSESSMENT METHOD USED

Uses individual assignments, group projects and class quiz and examinations to assess students' capabilities in applying the taught concepts. Uses the Catme system to check on teams' peer evaluation status.

FEEDBACK

Incorporates student feedbacks collected from university Course and Teaching Evaluation (CTE) system, UReply, Catme. Adjusts teaching material based on feedback.

MULTIMODALITIES USAGE IN CLASS



Appendix 3: Profile of Dr. J



PROFILE

Research interests include:
Corporate Governance
Board of Directors
Top Management Teams
Strategic Change

AWARDS

Innovative Pedagogy Award

TEACHING AREAS

Strategic Management
(4000 level)

Organisational Behavior
(3000 level)

Human Resource Management
(3000 level)

TEACHING EXPERIENCE

13 years teaching experience.
Receive no professional teachers
training but a practitioner of
innovative teaching tools

DR. J

Senior Lecturer

TEACHING PHILOSOPHY

Believes different digital tools serve different functions in teaching. Uses animation/storytelling to help students understand different organisation behaviors. Creates stories to help explain strategic and management concepts.

A big fan of cinema and creating stories. Passionate about trying out new technological tools and willing to use her own money to do so. Constant updates teaching tools and modifies teaching materials to suit students' learning pace and needs. Tries out new digital tools in lectures to explain theories, test students' understanding and improve collaboration.

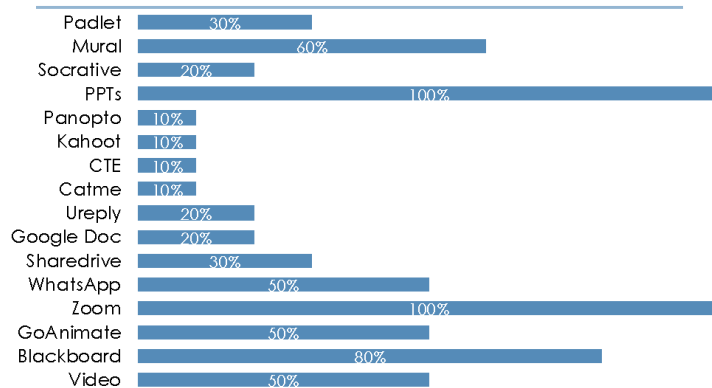
ASSESSMENT METHOD USED

Uses individual assignments and group projects. Check teams' working dynamics through Catme. Uses Mural and Padlet for class interactive exercises. Uses Kahoot for fun games during class and Socrative to do quick quizzes in class. Used GoAnimate to produce animated stories.

FEEDBACK

Incorporates students feedbacks collected from university Course and Teaching Evaluation (CTE) system, UReply, Catme. Adjusts teaching material based on constant self-reflection and student homework output.

MULTIMODALITIES USAGE IN CLASS



Appendix 4: Profile of Researcher



PROFILE

20 years' hotel experience
Program Director of an
undergraduate program

ACHIEVEMENTS

Received teaching award
Constantly tests out new teaching
tools for teaching

TEACHING AREAS

Management of Hospitality and
Real Estate Business
(1000 level)
Food & Beverage Management
(2000 level)
Management of Lodging Facilities
(3000 Level)
Talent Development (3000 level)
Design Thinking (3000 Level)

TEACHING EXPERIENCE

10 years university teaching
experience.
15 years training experience in
hotel

RESEARCHER

TEACHING PHILOSOPHY

Designs course flow and content based on student-centred mindset. Regularly collects feedback from students to understand their learning preferences and behaviors. Revises teaching tool adoption and course content organization/structure were revised based on digital competency level. Creating a fun, interactive learning environment is her teaching philosophy.

Passionate about exploring new digital tools and devices to accompany her teaching. Regularly evaluates the effectiveness of various digital tools being used in class. Actively learns how to use new digital tools and tries them out in class. Fine-tunes adoption of new tools/platforms for teaching in semester end through self reflection. Frequently collaborates with researchers/teachers to test out new technological devices (360 interactive room) or platform (Mural, Padlet, Prezi, Kahoot, Socrative) and makes suggestions for improvement.

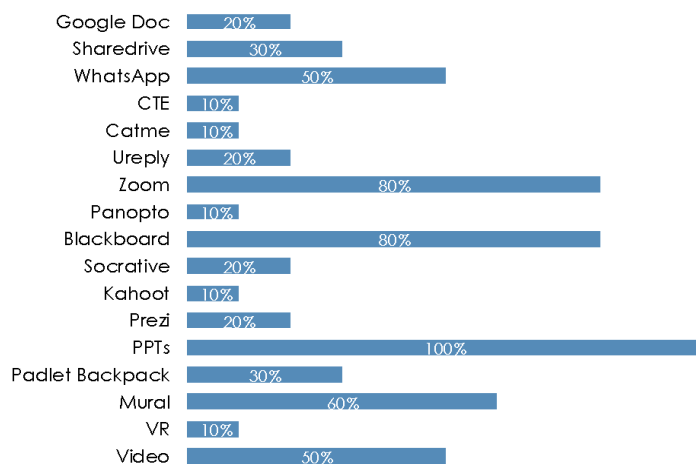
ASSESSMENT METHOD USED

Uses Mural as interactive online class discussion platform, Kahoot as ice-breakers, Socrative for pop quizzes. Invite students to present group projects by uploading videos to Youtube. Ask students to produce 3-minute presentation as part of the group project requirements.

FEEDBACK

Collects verbal feedback from students on weekly basis when introducing new technological tool/platform. Makes immediate adjustments based on student feedback.

MULTIMODALITIES USAGE IN CLASS



Appendix 5: Consent Form for Interviews and Artefacts

Informed Consent Form

Reimagining Digital Pedagogy in Higher Education Business Studies: Applying a 3D Model to Three Case Studies

Principal Investigators

Gentiana Cheung (gentiana@baf.cuhk.edu.hk)

Invitation to participate in a research study

Gentiana Cheung invites you to participate in a research study about how and why educators adopt certain digital means and how they designed their teaching practice using these tools.

This study is a research project conducted to meet the requirements of the dissertation. The researcher aims to interview tech-savvy faculty members like you who are experienced in using multiple digital means to teach the business course(s).

Procedures

If you agree to be part of the research study, Gentiana will send an email to you to schedule an interview at a time that is convenient to you. The first interview will take about 1 hour and a 45-minute follow-up interview will be conducted if needed. The interview format will be based on your preference as an interviewee and will be audio-recorded (face-to-face interview) or video recorded (Zoom meeting). Upon completion of the study, the recordings (audio & video) will be deleted.

Possible risk

Due to the small size of the population of faculty teaching business subjects, it is possible that participants could be identified based on course name. The researcher cannot offer a guarantee of confidentiality for courses that may be associated with the educator's name and course name. However, I will ensure your anonymity by using pseudonyms.

Data protection, storage, and usage

I plan to publish the results of this study and may include information that would identify you. As stated, I will use pseudonyms to protect your identity. In addition, there are some reasons why people other than the researchers may need to see information you provided as part of the study. This includes organisations responsible for making sure the research is done safely and properly, including the University of Bristol.

To keep your information safe, the researchers will not associate your name with interview recordings or notes. A pseudonym will be used instead.

All interview notes, raw interview data and course outline and related study material will be stored on a password protected CUHK-maintained server and will be deleted at the conclusion of the project. The data will not be used for other purposes nor made available to other researchers for other studies.

Voluntary nature of the study (participants' rights)

Participating in this study is completely voluntary. You have the right of withdrawal. If you decided to withdraw early, all the recordings that have been made up until that time will be deleted and any notes will be shredded.

Contact information

If you have questions about this research, including questions about scheduling, you may contact gentiana@baf.cuhk.edu.hk.

If you have questions about your rights as a research participant, or wish to obtain information, ask questions or discuss any concerns about this study with someone other than the researcher(s), please contact the University of Bristol.

Consent

By signing this document, you are agreeing to be in the study. You will be given a copy of this document for your records and one copy will be kept with the study records. Be sure that questions you have about the study have been answered and that you understand what you are being asked to do. You may contact the researcher if you think of a question later.

Audio/video recordings are part of this study. By signing this document, you agree to be recorded. All audio and video will be deleted upon completion of the study.

I agree to participate in the study.

Printed Name

Signature

Date

Appendix 6: School of Education Research Ethical Approval Record

From: Research Governance and Ethics Officer <Liam.McKervey@bristol.ac.uk>

Sent: Wednesday, May 27, 2020 7:26 PM

To: Gentiana Cheung <pc17101@bristol.ac.uk>

Subject: Ethics Online Tool: application signed off

Your online ethics application for your research project "Rethinking technology use in higher education business studies teaching: Applying the 3D model to understand teachers' experiences" has been granted ethical approval. Please ensure that any additional required approvals are in place before you undertake data collection, for example NHS R&D Trust approval, Research Governance Registration or Site Approval.

For your reference, details of your online ethics application can be found online here:

<http://www.bristol.ac.uk/red/ethics-online-tool/applications/105684>

Appendix 7: Interview Questions Design (Map With 3D Model)

3D Model Category	Interview Questions
A. Background information	<ol style="list-style-type: none"> 1. Can you briefly give us some information about your teaching background? (years of teaching, courses that you teach, when you started using technology in your teaching) 2. How many courses are you teaching and how many years have you been teaching these courses? 3. Can you think of a course that you are teaching using technological applications that you would like to discuss? Which one would you like to use for this case study?
B. What kinds of skills and knowledge are needed to undertake this task? (Operational dimension)	<ol style="list-style-type: none"> 4. What technologies have you adopted for this particular course? 5. What digital competencies are expected from students when considering such technologies? 6. What skills do you need to teach digitally?
C. In what ways does your adoption of learning technologies in teaching facilitate a particular type of learning within a specific topic? (Cultural dimension)	<ol style="list-style-type: none"> 7. Please explain why you consider adopting _____ in your course? 8. How does your adoption of _____ assist your teaching? 9. How do you compare the learning differences of using _____ and the conventional way of learning?
D. Do the teaching outcomes align with your multimodal resources and teaching methods? (Critical dimension)	<ol style="list-style-type: none"> 10. How do you measure the outcomes by using _____? 11. What are the outcomes of teaching and learning by using _____?
E. To what extent are these types of pedagogies critical or not? (Critical dimension)	<ol style="list-style-type: none"> 12. How do you think technologies have changed your teaching practices and learning outcomes? <p>In what ways do technologies shift the ways that business studies educators plan, teach and assess their students?</p>

Appendix 8: Interview Questions

1. Can you briefly give me some information about your teaching background? (years of teaching, courses that you teach, when you started using technology in your teaching)
2. How many courses are you teaching and how many years have you been teaching these courses?
3. Can you think of a course that you are teaching using technological applications that you would like to discuss? Which one would you like to use for this case study?
4. What technologies have you adopted for this particular course? Why?
5. What digital competencies are expected from students when considering such technologies?
6. What skills do you need to teach digitally?
7. Please explain why you considered adopting video/PowerPoint/digital devices in your course?
8. How does your adoption of video/PowerPoint/digital devices assist your teaching?
9. How do you compare the learning differences of using video/PowerPoint/digital devices and the conventional way of learning?
10. How do you measure the outcomes by using video/PowerPoint/digital devices?
11. What are the outcomes of teaching and learning by using video/PowerPoint/digital devices?
12. How do you think technologies have changed your teaching practices and learning outcomes?

Appendix 9: Student Interview Questions

1. How do you describe yourself as a learner when dealing with various digital platform/devices?
2. What are your preferences for learning using (PowerPoint, videos, storytelling videos, VR, etc.)?
3. What does virtual/digital/technology mean to you?
4. What are your impressions of these three teaching approaches?
5. How does the use of these digital tools assist your learning in the respective courses?
6. What are your learning expectations in these classes?
7. What are some of the hurdles that you encountered when using these learning tools?
8. What are the learning outcomes of using video/PowerPoint/digital devices?
9. How does using learning technologies assist your learning practices and learning outcomes?

Appendix 10: Participants Signed Consent Record

Contact information

If you have questions about this research, including questions about scheduling, you may contact gentiana@baf.cuhk.edu.hk.

If you have questions about your rights as a research participant, or wish to obtain information, ask questions or discuss any concerns about this study with someone other than the researcher(s), please contact the University of Bristol.

Consent

By signing this document, you are agreeing to be in the study. You will be given a copy of this document for your records and one copy will be kept with the study records. Be sure that questions you have about the study have been answered and that you understand what you are being asked to do. You may contact the researcher if you think of a question later.

Audio/video recordings are part of this study. By signing this document, you agree to be recorded. All audio and video will be deleted upon completion of the study.

I agree to participate in the study.

Signature

Date

June 18, 2020

Contact information

If you have questions about this research, including questions about scheduling, you may contact gentiana@baf.cuhk.edu.hk.

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I agree to participate in the study.

Signature

August 26, 2020

Date

Contact information

If you have questions about this research, including questions about scheduling, you may contact gentiana@baf.cuhk.edu.hk.

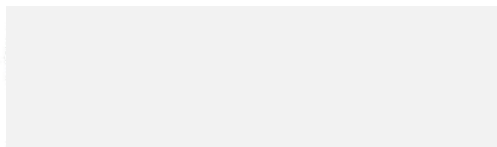
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I agree to participate in the study.


Signature

18th June 2020
Date

Contact information

If you have questions about this research, including questions about scheduling, you may contact gentiana@baf.cuhk.edu.hk.

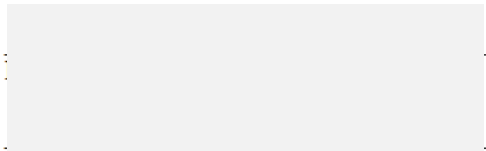
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I agree to participate in the study.


Signature

26.08.2022
Date

If you have questions about this research, including questions about scheduling, you may contact gentiana@baf.cuhk.edu.hk.

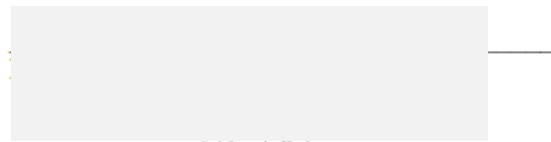
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I agree to participate in the study.



Signature

09/25/2022

Date

Appendix 11: Transcriptions and Artefacts files

Please click the below link to get access to the full transcriptions, PowerPoint slides and videos.

Interview Transcriptions

T1 - Prof. M interview transcriptions: Please click [HERE](#)

T2 - Dr. E first interview transcriptions: Please click [HERE](#)

T3 - Dr. J first interview transcriptions: Please click [HERE](#)

T4 - Dr. J follow up interview transcriptions: Please click [HERE](#)

T5 - Student A interview transcriptions: Please click [HERE](#)

T6:- Student B interview transcriptions: Please click [HERE](#)

Artefacts Files Access Links

Prof. M PowerPoint file: Please click [HERE](#)

Dr. E animation video: Please click [HERE](#)

Dr. J Case Study animation video (produced by GoAnimate): Please click [HERE](#)