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Student and Teacher Agency: Learning Technology Use in Additional Languages Education and its Impact on Student Metacognitive Awareness

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Declaration

To the best of my knowledge and belief, this thesis does not contain material previously published by any other person except where due acknowledgement has been made.

This thesis does not contain material that has been accepted for the award of any other degree or diploma at any university.

The research presented and reported in this thesis was conducted in accordance with the National Heald and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number HRE2020-0596.

Acknowledgement of Country

We acknowledge that Curtin University works across hundreds of traditional lands and custodial groups in Australia, and with First Nations people around the globe. We wish to pay our deepest respects to their ancestors and members of their communities, past, present, and to their emerging leaders. Our passion and commitment to work with all Australians and peoples from across the world, including our First Nations peoples are at the core of the work we do, reflective of our institutions' values and commitment to our role as leaders in the Reconciliation space in Australia.

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I am very fortunate to have two incredible, long-term role models in my life – my parents, Stuart, and Cheyné Cochrane. As teachers themselves, they have shown me the importance of a supportive family dynamic, embracing my passion for working in school communities and not being limited by anything. Mum and Dad - I cannot say thank you enough for the love, support, time, and resources you have provided me throughout my life. Your encouragement and faith in me mean everything.

This research started as a professional project, and in 2018, I met Associate Professor Susan Blackley at a conference, who challenged me to take it further. In 2019, I asked Associate Professor Blackley and Associate Professor Craig Whitsed to supervise my Master of Philosophy at Curtin University. I have been privileged to have worked with them for the last four years. Four years is a long time to spend on such a project, and to have their support, direction, guidance, and patience (from the other side of the country), I am incredibly fortunate indeed. Thank you for your insights, your influence, for challenging me, and for your encouragement. As Associate Professor Blackley retired in mid-2023, her role transitioned to that of my editor (with permission and approval from Associate Professor Whitsed as my Principal Supervisor). I am also incredibly grateful to her for her work in that role.

Abstract

Learning technology use in Australian additional languages education is increasing, and student and teacher capabilities and interactions with these are significant. While students engage with technology when learning languages, they often struggle to achieve their desired academic results, actively participate in learning activities, and demonstrate a solid grasp of curriculum content. Additionally, their knowledge of metacognitive and cognitive strategies related to learning technologies and their application often appear underdeveloped. To explore this, a mixed methods study investigated the connection between learning technology use, student and teacher agency, and student metacognitive awareness in two Queensland secondary schools.

The data revealed evidence of cognitive and metacognitive strategies, yet these were not explicitly discussed by teachers and students in their teaching and learning approaches that involved learning technologies. Furthermore, metacognitive (and cognitive) strategies remain underrepresented in frequently used digital pedagogical frameworks. To address this, based on this research, two original frameworks are proposed as resources for teachers and students to enhance metacognitive awareness and engagement when using technology for learning. These frameworks provoke a deep consideration of the opportunities, limitations, and metacognitive strategies relevant to technology use and additional languages education and can be applied in other curriculum areas. This study is unique due to the linking of learning technologies, metacognitive skills, and their contextualisation within the Australian (specifically Queensland) additional languages education setting.

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List of Acronyms and Abbreviations

ACARA	Australian Curriculum, Assessment and Reporting Authority
AI	Artificial Intelligence
AITSL	Australian Institute for Teaching and School Leadership
ALE	Additional Languages Education
ASOT	The Art and Science of Teaching
ATAR	Australian Tertiary Admission Rank
BYOD	Bring Your Own Device
CALL	Computer Assisted Language Learning
CLIL	Content and Language Integrated Learning
DEET	Department of Education and Training
DEMA	Digital Engagement and Metacognitive Awareness (Framework)
DS	Digital Storytelling
DoL	Dimensions of Learning
EALD	English as an Additional Language or Dialect
eTandem	Electronic Tandem Language Learning
EP	Education Perfect
ICSEA	Index of Community Socio-Educational Advantage
ICT/ICTs	Information Communication Technology/ies
LOTE	Language Other Than English
MCEETYA	Ministerial Council on Education, Employment and Youth Affairs
NALSAS	National Asian Languages and Studies in Australian Schools
OECD	Organisation for Economic Cooperation and Development
PBL	Problem Based Learning
POINT	Pedagogy, Ownership, Initiative, Name the thinking, Transfer (Framework)
QCAA	Queensland Curriculum and Assessment Authority
QCE	Queensland Certificate of Education
QTAC	Queensland Tertiary Admissions Centre
SAMR	Substitution, Augmentation, Modification and Redefinition
SOLO	Structure of the Observed Learning Outcome
SPeCT	Structures, Practices, Capabilities and Technologies
STEM	Science Technology Engineering Mathematics
TPACK	Technological Pedagogical and Content Knowledge
VET	Vocational Education and Training

Chapter 1 – Introduction

"If all teachers accept the need to improve practice, not because they are not good enough but because they can be even better, and focus on the things that make the biggest difference to their students, we will be able to prepare our students to thrive in the impossibly complex, unpredictable world of the 21st century."

(Wiliam, 2018, pp. 189-190)

1.1 Introduction

Teaching additional languages, historically known as LOTE (languages other than English), is an educational space continually transforming due to social, political, economic and, more recently, technological changes. As a native speaker of English growing up in Queensland, Australia, during the 1980s and 1990s, I was afforded an opportunity to learn Japanese thanks to the emphasis placed on linking Australia and Northeast Asia and prioritising economic, political, and strategic relationships between the two regions (Henderson, 2008). My engagement with Japanese in primary school was cursory at best, with access to about an hour of tuition each week. However, this initial exposure to a language and culture different from mine transformed my life. It intrigued and challenged me, and I thoroughly enjoyed learning to write and speak in a way my family could not understand. This experience became even more transformational for me when, as a secondary school student, I met some visiting Japanese students and was able to converse with them, in their native language rather than in English, and I felt that, in time, Japanese could become *my* language too. We enjoyed a conversation in which many of my friends could not participate, and I felt worldly, inclusive, curious, and intelligent.

The Asia-centric political drive that encouraged people to study languages in the 1980s and 1990s lacked learning technology support. Computers were often confined to 'computer rooms', with bars over the windows to protect the valuable equipment, and computers were arranged in rows, with two or three seats in front of each to accommodate students who engaged with them occasionally. Computers were only used for core subjects like English, mathematics, and humanities, and rarely, if at all, for supplementary subjects such as languages or, in my case, Japanese.

Today, students' and teachers' devices, as small as a smartphone, can enable access to multiple sophisticated, comprehensive dictionaries, and resources such as translation applications and easily accessible travel, historical, and cultural information. This type of information access was never even considered a possibility during my childhood. Heavy hardcopy dictionaries and grammar books relegated to a plastic box that moved from class to class with the teacher characterised my early language learning experiences. So, too, did papers with Japanese characters written in their hundreds, notebooks containing carefully categorised grammatical references and examples, and pages and pages of writing samples. For me to learn Japanese in a meaningful way, my study involved not only learning words and characters but also learning about grammatical and cultural concepts through rich conversations with my teachers – often about 'why' one grammatical decision was preferential or more culturally appropriate to another, and then demonstrating my newly developed understanding of a concept by showcasing another example, or by explaining it to another student.

The 'hows', the 'whys', and the 'what next' were central to my success as a student of additional languages. I learnt *how* to study, *how* to make choices about vocabulary, *how* to prioritise my language learning needs, *how* to decide when an approach was or was not working, and *how* to look at a concept from another angle or to seek advice from a teacher or a peer who understood the cognitive and metacognitive processes that were occurring when I did not. Although my teachers did not use words like 'metacognition' at the time I was fortunate to have teachers and mentors who took the time to ensure that my early engagement with Japanese and how I went about learning the language was more than just a flirtation with another language and culture. I enjoyed meaningful, purposeful engagement with exciting new ideas and inclusive ways of viewing the world and myself within it. Sometimes, these experiences involved complicated linguistic nuances and misunderstood, embarrassingly misappropriated cultural traditions, but it was all a part of the experience I relished as a child.

My dive into language and culture was not founded solely on knowledge or content but on action-based, reflective learning and, in time, understanding. My language-learning experience was well established using regular, high-quality feedback and challenge – a challenge not only due to the difficulty of the language itself, but challenge that involved crafting my sense of academic tenacity and learning how to be brave enough to acknowledge when my lack of linguistic success was not due to a lack of ability, but due to a lack of academic strategy, persistence, understanding, or organisation. My love of these experiences propelled me through my study of Japanese in secondary school, to a year-long Rotary Exchange to Japan as an 18-year-old, and then into the world of education as a teacher of Japanese and

humanities, where I have continued my love of learning and insatiable sense of curiosity and share these with my students and colleagues.

As a teacher, I have watched learning technologies gradually permeate additional languages classrooms and pedagogical practices over the last 20 years, and I often find myself comparing my students' learning experiences to those I experienced myself. When I make these comparisons, I do not query the inclusion of learning technologies in pedagogical practice or consider that my experience was superior to that of my students today. Instead, I consider the impact of this inclusion, and how student and teacher agency and awareness of learning practices in additional language classrooms could be affected. As Wiliam (2018) emphasises, students can be prepared for life in the 21st century if teachers accept the need to improve their practice – not because they lack skill, but because there is always a way to be better, and to focus on the needs of our students. With the recent publicity afforded to artificial intelligence and its place in education, conversations and debates about learning technology use will continue. This research seeks to better understand how learning technologies are currently used in additional languages education, and what, as teachers and researchers, our pedagogical response to their inclusion could and should be.

1.2 The Background and Motivation for the Study

Substantial research in the discrete areas of metacognition and information communication technologies (ICTs) in education is evident; however, research exploring the convergence of and interaction between metacognition and learning

technologies remains narrow, particularly in the context of Australian secondary school additional languages education. In this research, I aim to address this gap, drawing on global and existing Australian research as well as the findings from this study to determine what is currently known about learning technology use in additional language classrooms and by students of these languages. Furthermore, I seek to determine what needs to be done to ensure that students and teachers are utilising learning technologies in the most impactful ways. This is to maximise not only deep content learning, but also to develop a strong understanding of the role learning technologies could potentially play in strengthening their knowledge of additional languages and their awareness and application of metacognitive processes.

The motive behind this investigation is not to challenge the inclusion or value of learning technologies in schools or to focus on the positive or negative factors associated with their use. Rather, it is my intent to determine *how* students currently use their learning technologies for additional language learning. Further, whether a re-imagined pedagogical approach is required to maximise student engagement and content retention concurrently, as well as to increase student awareness and the utilisation of metacognitive strategies for learning.

As an educator, ongoing consideration of what is best or next practice is essential. This includes reflections and questions regarding the degree of agency gained or lost by stakeholders to modernise education by interacting with or adopting learning technologies. When students engage with online learning programs, questions I ask myself and my colleagues include the following:

- *Are students learning or simply 'doing', and how do we know?*

- *How do learning technologies aid language acquisition and 'value-add' to student metacognitive understanding of 'why' things are the way they are?*

- *Why do students preference one learning strategy over another?*

- *Where student and staff learning technology use is mandated, is it possible to provide learning strategy choices or frameworks for learning?*

- *How do teachers ensure that students and teachers are using the most appropriate technologies in the most appropriate ways?*

- *Do learning technologies inhibit or encourage self-regulated learning?*

- *How can professional knowledge and experience be combined with the learning technologies used in classrooms and by students?*

I have seen mixed outcomes for students who have adopted learning technologies quickly. Some students go from strength to strength, yet others struggle with their expectations of what technology can do for them. These students are often disappointed as they believe time spent on their language programs will indicate future academic success, which is often not the case. I have also seen teachers resign themselves to teaching grammatical and cultural concepts in ways with which they are unfamiliar or uncomfortable or change a reliable teaching technique – because that is how the 'program' teaches it. In the process, they appear to undermine their professional approaches to teaching, and their students therefore miss out on their valuable perspectives and tried-and-tested approaches to teaching and learning languages.

Students and teachers also appear at times to be deferring their expertise to many learning technologies with which they work, convincing themselves that these programs know better than they do, or in the case of some students, being tricked into a false sense of security, and allowing themselves to think they know something when it was clear (upon questioning) that they do not. Some students use learning programs to decide what requires their attention and what does not – and they are also quick to blame the program when they do not get the academic results they feel they deserve. So why is this happening? Why isn't the learning 'sticking,' and what, if anything, can be done about it?

While on a technology-free outdoor education camp in 2016, one of the educators referenced a marketing article that highlighted content retention differences between information consumed via print to that consumed via screens (Millward Brown, 2009). I immediately started thinking about how, if this was true in a marketing context, the same could be true in a school context where students were being asked to engage with digital textbooks. Would learning via a screen impact their ability to retain curriculum content? The school I was teaching in at the time was transitioning from being a school with computer classrooms to a 'BYOD' (bring your own device) program and allowing students to have their mobile phones on site. I questioned the efficacy of encouraging students to access academic texts (e.g., textbooks) via digital means when there was evidence indicating that retention of information was more likely to occur when the physical 'experience' of engaging with a tactile resource was more likely to deliver evidence of information retention (Dooley, 2012). I then embarked on a school-based project with a colleague, carefully observing the technology use of additional languages students. These observations

reinforced the questions I have mentioned above and so, in 2018, I applied to Curtin University to pursue a line of enquiry to investigate this issue further.

1.3 Bridging the Gap (Significance of the Study)

Although not intentional, the timing of this study has been significant in that it occurred mid-pandemic when Australian secondary school students and teachers were forced to adjust to teaching and learning in a pandemic-flux environment. As had been the case prior to the pandemic, during this time debates continued about the merits and appropriate limits of technology-assisted learning (Flavin, 2017; Gonski Institute for Education, 2020; Selwyn, 2009), and whether it had a legitimate place in contemporary education. It now appears that as society lives with the implications of COVID-19 indefinitely, there will be little, if any, choice for students and teachers about whether engagement with learning technologies remains optional. Further to this, in November of 2022, ChatGPT was released to the public and with that, Artificial Intelligence (AI) has been a relentless topic in education circles (Loos et al., 2023; Shaw et al., 2023). ChatGPT did not appear in the data collected in this study as it had not been released; however, its existence now impacts all future discussions around learning technology use due to its infinite applications.

Key findings leveraged from the analysis of the data in this study have been used to inform the production of two original digital pedagogical frameworks that have the potential to assist in the delivery of flexible, technology-supported teaching of additional languages. These strategies potentially support the fluidity of rich, multi-dimensional teaching and learning activities tethered to metacognitive

awareness concepts and create opportunities for students and teachers to critique the quality and reliability of feedback from digital interactions. To bridge the inequity gap in terms of school resourcing and student access to learning technologies, if the ideas and strategies produced are malleable enough to enable offline or reduced digital interaction, that must also be considered a realistic way forward in an educational environment that promotes and expects interaction with technologies. This is particularly important to address the needs of students with no or reduced access to learning technologies or for whom the quality and reliability of the learning environments are poor.

Essential, too, is the importance of developing and adhering to a definable concept of 'effective' learning technology use for additional languages education. This has not been found in any academic literature contextualised in this way. In a report by the Scottish Government (2015), multiple references were made to 'effective' technology use and the need for teachers to engage with it. However, nowhere in the 2015 document could a workable definition for 'effective' use of technology be found. In 2020, the OECD determined that "to be effective, teachers' practices need to be grounded in a body of knowledge acquired through quality training" (p. 2), but how much training constitutes what is sufficient to be effective remains undefined.

In July of 2023, the OECD released an additional document entitled *Shaping digital education: Enabling factors for quality, equity, and efficiency* and in this document, the word 'effective' appears on 119 pages. In it, the OECD states that "if used effectively, these technologies promise to transform teaching and learning

practices and enhance educators' ability to provide high-quality instruction, to reduce learning inequalities through more differentiated learning approaches, and to create more inclusive and efficient education systems" (2023, p. 5). The focus of this document is predominately on addressing policy gaps that emerged during the COVID-19 pandemic and relating these to the shaping of digital education; however, some broad guidance is offered regarding digital pedagogical approaches in a range of countries. What remains absent in this document is an emphasis on the importance of metacognition – the word *metacognition* did not appear at all in the document, which again indicates that there remains a gap in terms of how learning technologies and metacognitive processes can be interwoven in pedagogical practices.

For emerging teachers of additional languages education and existing practitioners who find themselves between the pre-and post-COVID worlds, a need exists to better understand how students and teachers currently use learning technologies. Using these insights and evidence, strategies to bridge the gap between these spaces can be conceptualised, then shared and disseminated in ways that are accessible, logical, and pragmatic. Evidence-based and pedagogically sound questions for administrators and policymakers are necessary to ensure that the rationale that shapes language education programs is robust, achievable, and equitable.

1.4 The Research Questions

The overarching research question that this research addresses is:

***To what extent is learning technology use in additional languages education
impacting the agency of students and their teachers and impacting student
metacognitive awareness of language-learning processes?***

Given the above, the following five (5) questions anchor the research undertaken in
this research project:

- How do secondary school students of additional languages perceive learning
  technologies to influence their learning, engagement, and agency? (RQ1)

- How do secondary school teachers of additional languages perceive the
  influence of learning technologies on their pedagogical practices? (RQ2)

- How does learning technology interaction impact students' learning and their
  perceived educational achievement when studying additional languages?
  (RQ3)

- How do teachers and students make decisions about their use of learning
  technologies for the teaching and learning of additional languages? (RQ4)

- To what extent do agency and learning technologies influence students'
  metacognitive awareness of language learning processes? (RQ5)

1.5 Aims and Scope of the Study

This research investigates the convergence of and interaction between additional languages students' use of learning technologies and their metacognitive awareness of learning processes. The intersections between decision-making, agency, and metacognitive awareness are explored, and how these individually and collectively influence secondary students and their teachers' choices regarding how they interact with and use technology for learning and teaching languages.

Students' (Baron, 2017; Johnson & Salaz, 2019) and teachers' (Abbott, 2016; Blackley & Walker, 2017; Howard & Mozejko, 2015) use of learning technologies, in addition to metacognition (Gordon, 1996; Rhodes, 2019; Schraw & Dennison, 1994) have been studied extensively as separate foci of investigation rather than as interrelated concepts. Within additional languages education, investigations relating to metacognitive awareness are increasing. For example, Ruiz de Zarobe and Smala (2020), working in Content and Language Integrated Learning (CLIL), drew on studies in Spain and Australia to propose a theoretical framework using metacognitive awareness to capture relationships across and between teaching, learning and the use of language learning strategies. Despite this paper establishing a connection between metacognitive awareness and additional languages education, the explicit linking of metacognitive awareness with learning technology use in Australian, secondary school languages-learning contexts remains to be seen. For these reasons, this study offers an original contribution to the field.

Teaching and learning can be conceptualised as "activities made up of both individual and collective actions directed toward particular ends and located in

particular social and cultural contexts" (Groundwater-Smith et al., 2001, p. 110). Teaching and learning processes were examined in this research by observing participants in the classroom and asking them to reflect on their individual experiences. Using a mixed methods approach to examine both quantitative and qualitative data, 38 students and 14 teachers of additional languages across two schools (government and independent) were asked to assess the impact of increased learning technology use on their pedagogical practices (teachers), their learning (students), and their perceptions of the potential impact these have on students' metacognitive awareness around language learning processes.

The contribution of the findings of this current research in technology-enhanced, additional languages teaching and learning will enable curriculum, policy, and pedagogical decisions to be more relevant, pragmatic, and reflective of teacher, student, and community needs.

1.6 Thesis Outline

Chapter 2 synthesises and critiques academic literature relating to learning technologies in additional languages education. It highlights the current representation of global, school-based data and the need for more representation of data relating to the link between learning technologies and metacognitive awareness, specifically data representing Australian education. Chapter 3 outlines the methodology, design, and execution of the research. Data obtained in this research are discussed and analysed in Chapters 4, 5, and 6, and *Key Findings* from this research are highlighted throughout. A summary of the data as a whole occurs in

Chapter 7, linking the findings from the research to implications for future teaching and learning. In Chapter 8, two original frameworks for learning with technologies are presented and discussed, linking their application to the key findings in this research, existing research, and noting opportunities for further exploration. In the final summary contained in Chapter 9, the research questions are revisited, linked to the key findings, and future research steps are recommended.

Chapter 2 – Literature Review

"When children learn language, they are not simply engaging in one kind of learning among many: rather, they are learning the foundation of learning itself."

(Halliday, 1993, p. 93)

2.1 Introduction

Interaction with learning technologies and the evolution of related capabilities are integral and significant elements of contemporary Australian education (Australian Curriculum Assessment and Reporting Authority (ACARA), 2010). The educational potential afforded by learning technologies is far-reaching; however, these technologies are also controversial due to potential complications that arise from their use or misuse (Flavin, 2017), and commentary around their use in education worldwide "oscillates between euphoria and apocalypse" (Zierer, 2019, p.2). While many students appear to be engaged in experiences using learning technologies, they do not consistently achieve desired academic outcomes, nor can they demonstrate a thorough understanding of curriculum content (Organisation for Economic Cooperation and Development (OECD), 2015). Significantly, for many learners, the metacognitive processes required for deep learning do not appear to be developing or enhancing despite technologists' and educators' promises to promote the application of learning technologies in contemporary learning environments (Gonski Institute for Education, 2020).

This chapter reviews and synthesises literature related to this study. This includes defining key terms and contextualising them within the current research, examining the place of additional languages education in Australia, and how learning

technologies are placed in the Australian curriculum and applied in additional languages education. Further, the advantages and disadvantages of technology-enhanced education, the impact of learning technology use on teachers' pedagogical practices, and prominent global frameworks for the integration of learning technologies into teaching and learning are examined. Finally, the importance of metacognitive awareness and engagement is considered. Within these, research gaps will be identified, and the influence these gaps have on the motivations for this study revealed.

2.2 Definitions

Defining concepts and constructs so that there is universal agreement is fraught with challenge. Gerring (1999), for example, observed that all, "authors make lexical and semantic choices as they write, and thus participate, wittingly or unwittingly, in an ongoing interpretive battle" (p. 359). Highlighting the challenges and necessity of defining concepts in social science research, Gerring (1999) argued that it is *how* terms are defined and not merely that they *are* defined that matters. The following defines key terms as they are used throughout this thesis.

Learning technologies is an umbrella term used throughout this research project that encompasses any device, application, network-based program or system that supports teaching, learning, and assessment (Howell & McMaster, 2022; Liu et al., 2020). In the literature, learning technologies encompasses *digital technologies* (Abbott, 2016; Gonski Institute for Education, 2020; Graham & Sahlberg, 2021), *digital education technologies* (Organisation for Economic Cooperation and

Development (OECD), 2023)*, information communication technologies (ICTs)* (Blackley & Walker, 2015; Howell, 2013; Livingston, 2012) and *educational technologies* (Bouygues, 2019; Sweller, 2019).

Additional languages education (ALE) refers to any language studied by students in addition to the language they speak in their homes. Additional languages education has been referred to as 'foreign' or 'second' languages; in some schools, it is also referred to as 'modern languages' (Reitzenstein, 2018). Since the early 1990s, the notion of languages being considered 'foreign' or 'second' has been challenged considerably (Collins & Muñoz, 2016; Spolsky, 1999), particularly where globalisation has weakened the argument that one nation must communicate in a single language exclusively (Kramsch, 2014). The term 'LOTE' (Languages Other Than English) has been discontinued in Queensland due to the outdated perception that anyone learning an 'additional language' does so in addition to English. In this thesis, the term *additional languages education* refers to any language learnt in schools.

Metacognition is defined as "knowledge and cognition about cognitive phenomena" (Flavell, 1979, p. 906) and, when used with school students, it is often referred to as "the ways learners monitor and purposefully direct their learning" (Quigley et al., 2021, p. 9), "thinking about thinking" (Rhodes, 2019, p. 168) or "the science of learning" (Agarwal & Bain, 2019, p. 3). *Metacognitive awareness*, or an awareness of one's cognitive processes, is used in this thesis drawing on Zimmerman's (2002) definition of metacognitive awareness as being the ability to be cognisant of one's learning abilities and the most appropriate strategies and thinking or learning behaviours to support these.

The word 'engagement' has a broad range of often-contested definitions that reflect multitudinal disciplinary and situational uses. In the context of this research, *engagement* is drawn from the work of Boekaerts (2016) and defined as "the observable and unobservable qualities of students' interactions with learning activities" (p. 77). This definition encompasses behavioural, emotional, cognitive, and social engagement dimensions identified in the work of Wang et al. (2016). It is straightforward and easily understandable for students and their teachers, hence its selection for this work.

Having defined the key terms deployed across this thesis, the following literature review first explores the place of additional languages education in Australia, focusing on how and why it became a significant learning area within the Australian curriculum.

2.3 Additional Language Education (ALE) in Australia

National policy and educational targets have shaped additional language education in Australia since the 1970s. The following briefly elaborates some of the more salient policies affecting additional language teaching in Australia. It also demonstrates how susceptible additional language education programs can be to changes in policy and political priorities. Policy decisions translate into opportunities for students in terms of which languages are offered for study and ultimately shape their learning experiences in classrooms.

Since the mid-1970s, national language policies and educational targets for additional languages education have been subject to intense public debate and

scrutiny due to the lack of planning and actionable steps to achieve the professed objectives (Djité, 1994). Policy documents such as *A National Language Policy* (Senate Standing Committee on Education and the Arts, 1985), the *National Policy on Languages* (Lo Bianco, 1987) and the *Australian Language and Literacy Policy* (Department of Employment Education and Training (DEET), 1991) prioritised the learning of additional languages in Australian education, shifting the perception of language study "as a peripheral skill for the idle or the pretentious" to "an essential element in a modern individual's education" (Leal, 1992, p. 13).

The *Garnaut Report* (Garnaut, 1989) in the late 1980s stressed that for macroeconomic reform to occur, in contrast to other languages and cultures, Asian studies were an essential area of focus (Henderson, 2008). This was further supported by the *Asian Languages and Australia's Economic Future* report (Rudd, 1994), and the accompanying *National Asian Languages and Studies in Australian Schools (NALSAS)* strategy (MCEETYA, 1998). This report stemmed from a 1989 Queensland political decision to prioritise the study of Asian languages and cultures, and where Kevin Rudd - a pragmatic, Mandarin-speaking and highly-influential public servant - proposed a strategic and economic future for the country (Henderson, 2008). These policies significantly impacted the advocacy of engagement with Asian languages in Queensland, with the priority languages at the time being Mandarin Chinese, Indonesian, Japanese, and Korean (Normand-Marconnet & Lo Bianco, 2015).

Significantly, in 2008, the study of additional languages was identified as one of eight key learning areas in *The Melbourne Declaration on Educational Goals for Young Australians* (MCEETYA, 2008). This document highlighted the place of

additional language education in Australia and was agreed to by Ministers of Education in all states and territories (Scarino & Liddicoat, 2009). The development of an Australian Curriculum for Languages commenced in 2009, and the resulting document outlined "that language learning is for all students in Australian schools who bring their individual linguistic and cultural profile to their learning" (Australian Curriculum Assessment and Reporting Authority (ACARA), 2011, p. 1). Also, it documented the need for designated curriculum hours and a sustained provision of Classical Languages, Aboriginal and Torres Strait Islander Languages, and Auslan – representing the desire of some students to acquire a new target language or for others to formerly study a language spoken in the home (Australian Curriculum Assessment and Reporting Authority (ACARA), 2011). The *Alice Springs (Mpartwe) Education Declaration* in 2019 again confirmed eight key learning areas, stating that "these learning areas…are critical to equip students with the knowledge, skills and confidence to actively contribute to society and Australia's economic prosperity" (Education Council, 2019, p. 15). The Australian Curriculum: Languages (Version 9.0) now provides syllabi with two learning sequences for each of Chinese, French, German, Indonesian, Italian, Japanese, Korean, Modern Greek, and Spanish (with others to come in time), and continues to promote cross-curriculum priorities of Aboriginal and Torres Strait Islander Histories and Cultures, Asia and Australia's engagement with Asia, and Sustainability (Australian Curriculum Assessment and Reporting Authority (ACARA), 2023a).

Despite the ongoing promotion and prioritisation of language education in Australia over the past four decades, the number of students studying additional languages continues to decline. In October 2014, the *Senior Secondary Languages*

Education Research Project – Final Report acknowledged that the percentage of Australian senior secondary students exiting schooling with a second language was far lower (11%) than in other high-performing education systems (Asian Education Foundation, 2014). This report acknowledged that Languages had the lowest number of students in any learning area nationally. It also stated that the Australian Government was committed to reviving the teaching of languages to "ensure that at least 40 per cent of Year 12 students study a language in addition to English within a decade" (Asian Education Foundation, 2014, p. 3).

Australian enrolments in languages education remain well short of the 40 per cent target, with only 8.2% of exiting Year 12 students studying one or more languages in 2022 (Australian Curriculum Assessment and Reporting Authority (ACARA), 2023c), and the number of students in Queensland is less, at 6.9% (Queensland Tertiary Admissions Centre (QTAC), 2023). This figure is also considerably less than the 'high-performing education systems' Australia was compared to in 2014, as "on average across all countries and economies…70% of students reported that they speak more than one language" (Organisation for Economic Cooperation and Development (OECD), 2020a, p. 13).   When this information is combined and numbers transposed to represent non-language learning students, over 90% of Australian school leavers **do not** study languages and, therefore, in terms of languages spoken, are disadvantaged compared to similarly aged students in other parts of the world.

Strategies to increase student retention in the additional languages education space are regular discussion points for educators and policymakers. Many

contributing factors require attention and careful consideration, such as the impact of state policies, incentives such as bonus tertiary entrance rank points, curriculum content, availability of suitably qualified teachers, range of language options for young Australians, and pedagogical strategies that maximise engagement (Kohler, 2017). Although government policy supports additional language education, it has yet to specifically address or recognise the application of learning technologies to enhance language learning outcomes and pedagogical approaches.

This current research addresses this gap by examining how learning technologies have the potential to afford better learning outcomes. Exploring student and teacher utilisation of learning technologies in additional languages education provides pedagogical insights and opportunities for re-examining, evaluating, and improving teaching and learning. These processes could influence student engagement in this space, and subsequently, improvement in the quality of language education programs in Australia could positively impact student retention.

2.4 Crossover between Australian ALE and Learning Technologies

Australian policy and curriculum documents situate Languages Education and Technologies as two, separate priority areas. When educators wish to combine these areas, the amount of Australian and international literature available to them is narrow and situated mainly in tertiary, English as an Additional Language or Dialect (EALD) populations or focussed on specific and specialised teaching approaches or frameworks. Examples of teaching approaches or frameworks include Digital Story-telling (DS) (Oakley et al., 2023), Computer Assisted Language Learning (CALL)

(Pawlak & Kruk, 2022), Content Language and Integrated Learning (CLIL) (Arnó-Macià & Manchi-Barés, 2015; Cross, 2015; Gosling & Yang, 2022; Morton, 2018), Structures, Practices, Capabilities and Technologies (SPeCT) (Oakley et al., 2023) or Technology Pedagogical and Content Knowledge (TPACK) (Adipat, 2021; Zeng, 2022). The practicality of these specific approaches does not always lend themselves to wide-scale additional languages education in schools, however, they do provide educators with options regarding how they address the general challenges students and educators face when attempting to use learning technologies discerningly in Australian language education programs.

Digital feedback is one area within additional languages education that requires further research, as feedback is one of the most crucial influences on the acquisition of an additional language, and "represents an important opportunity for reflection and therefore a cue for improvement and progress because it draws the learner's attention to identify the gap between their interlanguage and the target language" (Caruso et al., 2019, pp. 58-59). It can be provided implicitly through conversation and interaction or, more explicitly, through corrections from a teacher or peer (Nassaji & Kartchava, 2017). The provision of feedback does not guarantee improvement in students' learning (Brookhart, 2012; Sadler, 2010). Whether in a second language learning environment or not, feedback requires interactivity, negotiation, and dialogue to "raise awareness in the learner about the specific task and the learning process" (Caruso et al., 2019, p. 60), and to ensure that the emphasis can shift between the feedback itself and how it is received and interpreted by the learner (Brooks et al., 2019). Research on feedback efficacy in Australian schools is increasing (Brooks et al., 2021; Brooks et al., 2019); however, most studies relating

to feedback in additional languages education, be they in Australia or elsewhere, remain in the tertiary teaching and learning space (Caruso et al., 2019; Nakata, 2015; Seibert Hanson & Brown, 2020).

Research relating to online feedback in additional languages education is also scarce, particularly within school environments. Online games are one of the most popular motivational and pedagogical strategies in additional languages education due to student exposure to target languages, the provision of feedback on grammatical or vocabulary accuracy, and the perceived autonomy provided to students to self-regulate their learning and engagement with curriculum content (Jauregi-Ondarra & Canto, 2023). Much of this research is based outside Australia, using samples not typical of Australian school community groups, and occurring in situations that do not replicate the ages of students or situations and conditions found in the majority of Australian school settings. Some examples include college or tertiary students learning English (Wang, 2015) or migrant communities learning the local target language to simplify their inclusion in the local population (Bradley et al., 2023).

While valuable in assessing the strengths and weaknesses of digital technologies and feedback for language learning, studies such as those mentioned earlier represent intensive language learning programs rather than the more distilled, long-term curriculum evident in Australian schools. This poses a problem for school-based teachers of languages as the reliable receipt of feedback (via online games, learning programs, or using digital samples of work passed between teacher and student) and the facilitation of quality, bi-directional or dialogic feedback loops is

open to interpretation and remains their responsibility. For these reasons, the researcher in this current study wished to investigate language students' perceptions of digital feedback efficacy (automated or teacher-driven), and how explicit attention to digital feedback in additional language education can improve pedagogical practices and classroom culture. This will be explored in Chapters 4 through 6.

The 2009 resource *Teaching and Learning Languages – A Guide* (Scarino & Liddicoat, 2009) referred to the integral nature of ICTs in language education and acknowledged their transformational potential and teachers' obligation to encompass them; however, specific examples of integration strategies were not provided. Teachers were reminded that "when we do this (incorporate ICTs into language education), our pedagogies engage students, enhance achievement, create new learning possibilities, and extend interaction with local and global communities" (Scarino & Liddicoat, 2009, p. 55) and references were only made to generalised ideals rather than specific, instructional, and practical actions. Within the current Australian Curriculum, only references to general suggestions of learning technologies integration within language education contexts are offered, with any pedagogical rationale, orientation, or specific details remaining the teacher's responsibility (Australian Curriculum Assessment and Reporting Authority (ACARA), 2023a).

This has implications for language education due to the linguistic differentiation in the languages offered to Australian students. What is pedagogically necessary to develop the same or similar skills in different languages varies significantly. Additionally, generational, social, and pedagogical differences, differences in the range of digital programs and resources, in addition to variation in

school environments and student cohorts are also inconsistent across the country. For these reasons, curriculum documents require greater detail to support teachers in their implementation. This highlights a gap in understanding and the need for further research exploring the integration of learning technologies in secondary language education in the Australian context and how these afford or influence metacognition for additional language learners.

2.5 Learning Technologies in Australian ALE

The Alice Springs (Mparntwe) Education Declaration of 2019 confirmed not only the place of additional languages education in the Australian curriculum but also the place of learning technologies as a means of promoting equity and excellence, successful lifelong learning, confidence and creativity, and being active members of the community (Education Council, 2019, p. 4). In terms of curriculum, this Declaration acknowledged that "educators are supported to continually develop their own skills in order to teach young Australians the essential skills and core knowledge for a modern society and economy" (Education Council, 2019, p. 11).

Learning technologies were linked explicitly with the curriculum areas of science, technologies, engineering, and mathematics (STEM), and deemed "critical to equip students to engage productively in a world of rapidly changing technology" (Education Council, 2019, p. 15). In *The Alice Springs (Mparntwe) Education Declaration*, and those before it in Hobart, Adelaide, and Melbourne, learning technologies were not linked in such a way to additional languages education. Rather they were given less emphasis in the learning area and referred to generally when

describing the curriculum as a means of providing "a foundation for further learning and adult life" due to the inclusion of "practical skills development in areas such as ICT" (Education Council, 2019, p. 15).

Within the current Australian Curriculum, 'Technologies' is one of the eight key learning areas focusing on digital literacy by understanding data, digital systems, audiences, procedures, and computational thinking (Australian Curriculum Assessment and Reporting Authority (ACARA), 2023a). It is a compulsory part of a young Australian's education until Year 8, and then becomes optional in Years 9 and 10. In addition to a stand-alone learning area, learning technology use for developing digital literacy also features in each of the key learning areas. Within this document, the content requires students and teachers to remain "responsive to ongoing technological developments" (Howell & McMaster, 2022, p. 72) , but does not specify how this should occur.

One of these ongoing technological developments in Australia was the need for schools and educators to pivot almost exclusively to online learning environments during the COVID-19 pandemic in 2020 and 2021. More than ever at that time, learning technologies became an "omnipresent force in the lives of Australian children" (Gonski Institute for Education, 2020, p. 4). Before the pandemic, it was estimated that in Australia, 94% of teenagers, 67% of primary children, and 36% of pre-schoolers had their own screen-based device (Rhodes, 2017). This rate remains exceptionally high, with more than 80% of Australian children in the recent *Growing Up Digital* sample owning at least one screen-based device and, on average, 3.3 devices each (Graham & Sahlberg, 2021). Given that learning technologies are so

visible in the contemporary Australian curriculum landscape and that children are engrossed by their presence, understanding the interaction of students and their teachers with these devices is crucial. School communities and broader educational bodies must ensure that assumptions are checked, opportunities are maximised, and any chance for pedagogical improvement is seized.

2.6 Advantages and Disadvantages of Learning Technology Enhanced Education

Whether popular or otherwise, learning technologies are now commonplace in educational settings and used by students and their teachers in myriad ways. Their use enables connections within and across teaching and learning spaces, creativity, content learning, practice and sharing, accessibility for students and staff with physical or geographical needs, and entertainment (Gonski Institute for Education, 2020; Organisation for Economic Cooperation and Development (OECD), 2015). Learning technologies also permeate significantly into time within the home, with Gonski reporting that almost half of children's waking hours are spent in front of digital screens (Gonski Institute for Education, 2020). However, Gonski does not report whether children are engaged with what they are viewing or doing during this time.

The ways students (Baron, 2017; Johnson & Salaz, 2019) and teachers (Abbott, 2016; Blackley & Walker, 2017; Howard & Mozejko, 2015) utilise learning technologies are widely documented, and discussion around the inclusion of learning technologies in education has provoked strong, sometimes polarised responses. In the 1990s and 2000s, literature focussed largely on the perceived "pedagogical

potential of available and emerging technology" (Groundwater-Smith et al., 2001, p. 151), and the "positive role that technology can play in human interaction and evolution" (Kearsley & Shneiderman, 1998, p. 23). Emphasis was placed on the interactivity and collaborative potential of learning technologies, improvement of student (and teacher) technological skills, increased student motivation and interest, and addressing equity concerns for those isolated due to physical need or location. Also emphasised was the importance of teacher acceptance that their students knew more about the technological world than they did, and that to be an 'effective' user of technology in the classroom, they needed to focus on the construction of collaborative teacher-student relationships to leverage student knowledge for the benefit of their education (Groundwater-Smith et al., 2001).

In 2001, Marc Prensky coined the term 'digital natives', referring to people born since 1980 who, due to exposure and interaction with the digital world, enjoyed innate confidence and ability and were "native speakers of the digital language of computers, video games, and the Internet" (Prensky, 2001, p. 2). In addition to this, anyone born before 1980 was dubbed a 'digital immigrant', referencing their need to "adapt to their environment…(but who) always retain…their foot in the past" (Prensky, 2001, p. 3). This categorisation has been supported (Palfrey & Gasser, 2008) and challenged (Kirschner & De Bruyckere, 2017; Selwyn, 2009) by many scholars.

Despite the contention, these labels continue to be perpetuated socially because of the intuitive appeal and "their associations with wider moral and ideological debates over young people and digital technology" (Selwyn, 2009, p. 371). Selwyn (2009) argues, for example, that their use has led to "dichotomous 'them' and

'us'" arguments (p. 369), emphasising problems created by defining whole generations of people by the periods in which they were born rather than by differentiating capability based on *how* people work with technology (Spiegel, 2021). In many respects, generalisations such as those initiated by Prensky have facilitated assumptions relating to people's technological capabilities, and thereby reduced or even eliminated necessary foundational instruction relating to successful learning technology operation, which, in many cases was required (Spiegel, 2021). The extent of these issues within an additional languages education context is yet to be fully understood, and the research conducted as a part of this current study will contribute to addressing this issue. Academic discussions, reports and articles regarding learning technology use in the last ten years appear to be more discerning than the Prensky publications. These publications more critically reflect the benefits offered to educators and learners as well as the difficulties and challenges posed by an increasingly digitised approach to teaching and learning (Joshi, 2023; Organisation for Economic Cooperation and Development (OECD), 2020b; Sahlberg, 2020; Vincent-Lancrin et al., 2022).

According to Gonski (2020), Australian teachers believe that inquiry or problem-based learning activities may be significantly enhanced with the use of learning technologies, and that their presence may also enhance student homework, assessment, group and individual activities, and reporting. Learning technologies have also been recognised for their affordances to increase students' motivation in their learning (Banditvilai, 2016; Hwang & Wu, 2014), and increase academic engagement, particularly when utilised in a 'blended learning approach' (Joshi, 2023; Ribbe & Benzanilla, 2013). However, there is also more recent evidence that during

the COVID-19 Pandemic, Australian students felt less engaged with their teachers, despite connection and engagement being a priority of staff at the time (Ewing & Cooper, 2021).

Challenges related to learning technology use also require consideration and, despite the publicised positive impacts of learning technology use in education, there is a strengthening undercurrent of concern in the general public and educational communities regarding equitable access to learning technologies (Flack et al., 2020) as well as in relation to the adverse effects of technologies, whether for learning, entertainment, or social purposes (Pele, 2023). The centrality of learning devices in students' lives and the 'connectedness' that is a result of unlimited Internet access negatively influences children's overall well-being (McCrindle & Fell, 2021; McDool et al., 2020), and can be pervasively detrimental to their mental health, social, and physical development (Toh et al., 2019). Many students knowingly use technology for task and challenge avoidance (Brown et al., 2014; Graham & Sahlberg, 2021; McWilliam, 2017) or to distract themselves with games, social media, or music (Gonski Institute for Education, 2020; Johnson & Salaz, 2019; McWilliam, 2017; Selwyn, 2019; Wiklund & Andersson, 2018). Furthermore, there is evidence that media multitasking is negatively linked with learning performance (Bouygues, 2019; Wu, 2017), particularly when untrained (Cardoso-Leite et al., 2015) and prolonged exposure to any screen fatigues students' eyes (Farinosi et al., 2016; Loh & Sun, 2018; Mizrachi, 2015).

Although students today remain categorised by the 'digital natives' label, for certain activities, such as reading for retention (Baron, 2017), engaging in deeper

learning experiences (Johnson & Salaz, 2019) or reading for pleasure (Loh & Sun, 2018), there is substantial evidence supporting the use of printed materials over digital ones. This is because they provide more pleasant, tactical experiences (Farinosi et al., 2016; Loh & Sun, 2018; Mizrachi, 2015), and are more likely to result in content retention. That poses a problem for educational institutions championing learning and teaching approaches that are primarily situated within a digital space as it suggests that the technology in and of itself is not problematic; however, its utilisation (directed or self-managed) within teaching and learning experiences and the subsequent impact on student performance requires pedagogical evaluation (Bergdahl et al., 2018; Livingston, 2012) and is one of the primary aims of this current research.

2.7 Impact of Learning Technology Use on Teachers

Sector expectations related to the inclusion of learning technologies are also emotionally and practically challenging for teachers. Research regarding the benefits of teaching and learning is plentiful (Gonski Institute for Education, 2020), and educators acknowledge the potential positive learning outcomes afforded by technologies (Baron, 2017). However, opinions are varied and, in some cases, polarised about the value of these (in practice), and how willing educators are to work with limitations such as multiple devices in play at the same time, slow network speeds, or students with broken, uncharged, or incompatible devices (Johnson, 2019), and school demands around implementing a crowded curriculum (Sheffield et al., 2018). Teachers also question whether learning technologies make teaching more

convenient or whether curriculum objectives are overshadowed by the demands of digital implementation (Abbott, 2016; Cartwright & Hammond, 2007).

Emotionally, teaching and learning via digital means is threatening for some teachers as they are required (indicated in national and state curricula and at the school level) to provide digital learning experiences in their classrooms. In many cases, they are fearful of being deemed inadequate (Zierer, 2019) or require significant support to achieve this (Organisation for Economic Cooperation and Development (OECD), 2020b; Sheffield et al., 2018). Teacher professional learning related to learning technologies use requires time, training, and investment, and has been explored empirically over the past four decades (Bond et al., 2020; Hebemstreit, 1985; Kearsley & Shneiderman, 1998). It remains controversial due to the increased complexity and diversity of tasks with which teachers are expected to engage (Organisation for Economic Cooperation and Development (OECD), 2019), and how these place additional demands on teachers' time (Organisation for Economic Cooperation and Development (OECD), 2020c, 2023). Ways to address these are reflected in literature, for example the OECD referring to the importance of "fostering professional collaboration"(2023, p. 76), or networking to assist in the development of self-efficacy and digital confidence in the classroom. However, the examples and explanations of how to action ideas are very country- or system-specific and may not necessarily be easily transferrable into education or school systems.

Integrating learning technologies into schools has digitised many logistical aspects of school organisation, and increasingly influences pedagogical practices to enhance teaching and learning processes (Blackley & Walker, 2015) and student engagement (Bergdahl et al., 2018). Despite this, the need for judicious decisions

about the use of learning technologies in schools remains, as the mere presence of learning technologies does not guarantee authentic engagement or integration with contemporary teaching and learning practices or enhanced student performance (Flavin, 2017; Howell & McMaster, 2022; Livingston, 2012; Organisation for Economic Cooperation and Development (OECD), 2015; Orlando, 2015; Selwyn, 2019). Baskin and Williams (2006) identified the rhetoric of 'using' technology in many historical education policies, thereby positioning learners, teachers, and ICT leaders as 'users' or 'clients' of the technologies with which they were working. Their concern was that "clients are 'done to' and 'done for'; they are not expected to impose themselves on the technology, but are much more expected to have the technology imposed on them" (Baskin & Williams, 2006, p. 457). Without professional autonomy to make decisions about what and how teachers use learning technologies in their professional practice, there is a danger of unnecessarily amplifying the use of learning technologies when "working without technology or working at the substitution (most simplistic) level may be the best pedagogical decision for the particular students and content you are teaching" (Howell & McMaster, 2022, p. 61).

However, working with learning technologies is no longer optional for Australian teachers. The current Australian Professional Standards for Teachers cites three different standards that reference teacher engagement or 'use' of ICTs – *Standard 2.6 Information and Communication Technology (ICT)*, *Standard 3.4 Select and use resources* and *Standard 4.5 Use ICT safely, responsibly and ethically* (Australian Institute for Teaching and School Leadership (AITSL), 2011). For many educators, be they early-career or experienced, knowing that integrating learning technologies into their professional practice is compulsory can be uncomfortable or

challenging. With the exponential increase in learning technology use and the subsequent need for expeditious skill development, further work in this field is required more than ever before, particularly work related to digital pedagogies. Howell and McMaster (2022, p. 23) contend that until technology is fully integrated into teaching and learning in the future, "it is important to focus on the fact that teaching with technology effectively in schools is less about the changing technology and more about changing the teaching and learning practices and culture in education". Therein lies the challenge for educators: while knowing *what* needs to occur, it is not always clear *how* to achieve these objectives, highlighting the need for clear digital pedagogical options for teachers and training that assists them in their development of an attitude and aptitude that is open to the possibilities and educational applications of emerging learning technologies (Howell & McMaster, 2022).

2.8 Prominent Frameworks for Integrating Technologies into Teaching and Learning

Two prominent frameworks for integrating learning technologies into teaching and learning practices are the Technological Pedagogical Content Knowledge (TPACK) Model (see Figure 1), and the Substitution Augmentation Modification Redefinition (SAMR) Model (see Figure 2). Koehler and Mishra (2005) introduced TPACK as a model to examine educators' skills to deliver curriculum via technology. SAMR, popular due to its simplicity and plain language (Blundell et al., 2022) was initially introduced by Puentedura via his blog (2006) and was based on observations of practice. It is a model that assists educators to evaluate and create learning

experiences for their students that transform learning via technology use (Tunjera & Chigona, 2020), however, as pointed out by Blundell et al.(2022), "the SAMR model does not acknowledge familiarity, prior practice, and educational context" (p.2).

The TPACK framework refers to the relationships between content, pedagogical, and technological knowledge and how the interplay between these areas enables educators to successfully incorporate learning technologies into their practice (Tunjera & Chigona, 2020). This framework is not explicitly attached to any one curriculum area, and so its adoption has been widespread. However, with that has also come criticism or a call for further research to better understand the specialist form of knowledge resultant from TPACK and what makes users of the framework experts as opposed to beginners (Saubern et al., 2020).

Figure 1

TPACK Model
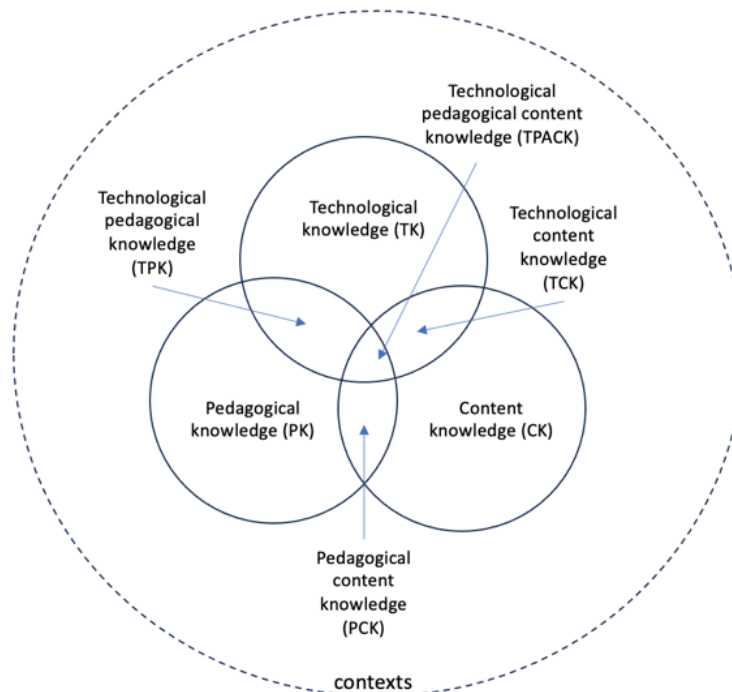
Note. From Howell, J., & McMaster, N. (2022). *Teaching with technologies: Pedagogies for collaboration, communication and creativity* (pages 32 and 36). Oxford University Press Australia & New Zealand. Copyright 2022 by Jennifer Howell and Natalie McMaster.

The Substitution Augmentation Modification Redefinition (SAMR) Model (see Figure 2) is a model that assists educators to assess the impact of a digital choice and identify digital options that transform or enhance learning, and is often used in conjunction with TPACK (Tunjera & Chigona, 2020). Each of the four levels (a 'SAMR ladder') refers to a method of learning technology use, and ranges from simple substitution (S) of a learning technology without task modification, to learning technology use that enables tasks considered "previously inconceivable"(R) (Puentedura, 2006). One analysis of this model by Dreamson (2019) indicated that the technological inclusivity of the SAMR Model heavily relies on teachers' digital experience and their willingness to incorporate learning technologies in their practice. This position is supported by Blundell et al. in their scoping review of the SAMR model in research, establishing that "SAMR is relative to teachers' established practice within a specific educational context and may be influenced by teacher' familiarity with the respective technology"(2022, p. 7).

Figure 2

SAMR Model
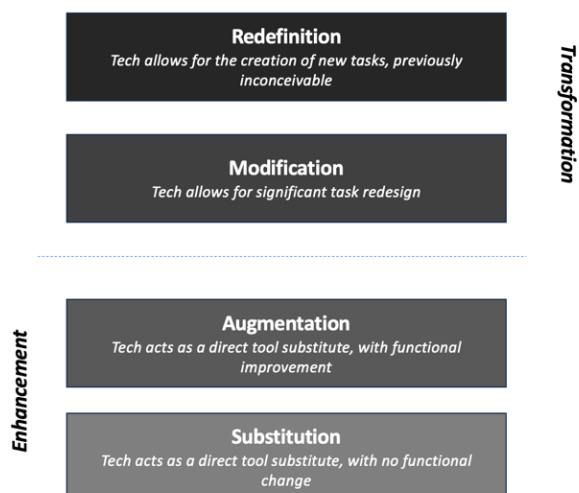
Note. From Howell, J., & McMaster, N. (2022). *Teaching with technologies: Pedagogies for collaboration, communication and creativity* (pages 32 and 36). Oxford University Press Australia & New Zealand. Copyright 2022 by Jennifer Howell and Natalie McMaster.

Both Blundell et al. and Dreamson suggest that there are problems with the SAMR model however, as when using SAMR, true "pedagogical innovation is hardly found"(Blundell et al., 2022, p. 133). This is due to teacher confusion regarding the transitions between levels, and therefore "inconsistent categorisation of educational practices" (Blundell et al., 2022, p. 7). For this reason, Dreamson suggests that pedagogical innovation must be positioned above the ladder, influencing learning technology use from above. Of note was his acknowledgement that, in this model, climbing up and down the SAMR ladder is necessary by teachers for learning technologies to be methodologically integrated into teaching and learning experiences. This emphasises the need for specifying actions and roles of teachers and their students, as "the nature of pedagogy and learning experiences is more evident" (Blundell et al., 2022). Where learning technology preferences and selections are fit-for-purpose, and where teachers experience professional autonomy to choose learning technologies based on their evolving abilities, institutional supports, and resources available, changes to pedagogical practices that use learning technologies are more likely to be accurately and consistently categorised as transformative at the highest level (Blundell et al., 2022; Dreamson, 2019).

2.9 The Importance of Metacognitive Awareness and Engagement

Of particular interest to the researcher in this current study is the absence of reference to student engagement and metacognitive skill development in learning technology integration frameworks such as TPACK and SAMR. Both metacognitive skill development and student engagement are often implied via the inclusion of

carefully curated learning technology-enhanced activities; however, neither is named explicitly as a component of a teaching and learning model or framework. Student engagement has long been a focus of educators (Azevedo, 2015; Fredricks et al., 2004), and metacognition is an area that is gaining increasing attention due to its common sense approach to learning, its impact on student academic outcomes, and its transferability across curriculum areas (Quigley et al., 2021). Both are complex research areas, and as learning technologies continue to evolve, so will student engagement and the metacognitive strategies associated with their use, which warrants further investigation.

Information relating to the metacognitive awareness of school students (even separate to its relationship with learning technologies) in literature is narrow but increasing as educators investigate the benefits of employing metacognition in the classroom as a transferrable tool for learning (Handel, 2020). For the most part, until recently, available research is usually linked to the academic achievement of young adults completing specific learning tasks in different curriculum areas (Kuzle, 2018; Young & Fry, 2008); however, this is beginning to change as studies involving school-age students increase in number (Wang et al., 2021). School communities are investing significant time and attention in exploring cognitive skills, metacognition, and the development of metacognitive skill development, with publications such as *Powerful Teaching* (Agarwal & Bain, 2019), *Understanding How We Learn – A Visual Guide* (Weinstein & Sumeracki, 2019) and *Make it Stick* (Brown et al., 2014) enjoying popularity. As with the frameworks discussed previously, these publications also lack explicit links between metacognitive activities and learning technology use, again implying inclusion via pedagogical choice.

The number of studies connecting learning technologies with metacognition have increased markedly in the last ten years; however, the impact of learning technology use on metacognitive skill remains debated. Cadamuro and colleagues (2019) examined the relationship between metacognition and ICT through fourteen studies between 2006 and 2019, concluding that there is a bi-directional interaction between the two areas, and that this interaction generally results in better learning outcomes (students and adults) due to increased motivation, automated feedback, and its impact on mental mechanisms and learning strategies, and the facilitation (forced or otherwise) for students to become aware of how they learn. The other key finding of this research was that "ICT produces better learning outcomes only for those students with better metacognition or who are provided with metacognitive training" (Cadamuro et al., 2019, p. 192). In contrast to these results, the *Growing Up Digital* report cited teachers observing "reduced (student) abilities to apply deeper metacognitive skills…and concentrate on tasks" (Gonski Institute for Education, 2020, p. 14). Given this, when engaging with digitally-facilitated teaching and learning experiences, there appears to be a strong argument for the explicit integration of metacognitive strategy prompts to avoid the passive receivership of information or erosion of metacognitive skills, which is examined in this thesis.

2.10 Summary

This chapter commenced by examining literature related to additional languages education in Australia and the crossover between this area and learning technologies. The place of learning technologies within additional languages education and the

need for pedagogical improvement in this space to support students and their teachers was also explored. Advantages and disadvantages of learning technology-enhanced education were examined, both in terms of its impact on students as well as on their teachers. Finally, two different digital frameworks for integrating learning technologies into teaching and learning were examined, and the absence of metacognitive skill development was highlighted.

It is clear from the literature that "technology is more than a tool – it changes how and what we learn" (Howell & McMaster, 2022, p. 23), or at least it should. The 'problem' is not the technology itself, nor the content that students access through it, but rather the lack of understanding around how to utilise it responsibly, safely, and with a purpose that meaningfully tethers its use to the intended curriculum. Within additional languages education in schools, learning technology remains an under-explored dimension. As highlighted in this literature review, little is known about how students and teachers perceive learning technologies to be driving pedagogy and affecting their agency relating to teaching and learning. Even less understood is how to engage teachers and learners with metacognitive processes and learning technology use in secondary school education and learning generally.

While the efficacy of learning technologies to promote metacognition and enhance learning outcomes is not fully known, what is understood is that learning technologies are popular and widely used by students. They enable transformative learning experiences, and choice in teaching and learning styles, and afford opportunities for access to learning materials and interactions not experienced outside target-language-speaking communities. However, with that access and

potential agency, there exists a temptation or an unconscious threat of automaticity, surface level or superficial engagement, and potentially missed opportunities for deep learning. In today's context, deep learning encompasses "and emphasises the cultivation of learners' critical thinking and problem-solving ability, creativity and innovation, and communication and cooperation" (Jiang, 2022, p. 3).

It is not conclusive that awareness of metacognition and its associated skills can lead to greater additional language knowledge and application. The impetus for this current study stems from curiosity around the place of metacognitive skills in digitally-enhanced learning, and the potential offered to students and their teachers should these skills be contextualised in additional language pedagogical practices and embedded in learning frameworks rather than studied in isolation. Would, and could, metacognitive skills and awareness make a difference to student agency, engagement, and academic success? This research aims to understand how students use learning technologies for acquiring additional languages and whether they are aware of how learning technologies work to help them do so.

As outlined in the introduction, this current study informs an understanding of these issues, provoking and contributing to discussions on whether a recalibrated pedagogical approach is necessary - one that champions the metacognitive dimension currently lacking within existing learning technology integration frameworks. This study also contributes to an under-represented area of investigation, linking additional languages education, learning technologies and metacognition. Significantly, it contributes data from the Australian secondary school context (another under-represented context) in these areas of academic interest. The

suggested frameworks presented in later chapters are of practical significance due to their potential to influence and improve digital pedagogical practices, and prompt discussions related to metacognitive awareness and application, not only in additional languages education but across curriculum areas.

The technology matters less than the way in which it is used (Livingston, 2012). Despite this message being received by educators and wider society repeatedly, there remains little guidance about connecting the *how* and *why* to the *what,* particularly as learning technologies evolve quickly. Metacognitive awareness and skill could mean the difference between learning technologies being 'done to' students and their teachers, and, coupled with careful consideration of existing and emerging pedagogical strategies, has the potential to transform second language education experiences into those that are 'done with' (focussing on interactive feedback), and most importantly, 'done better'. This research is significant because it provides empirical insight and addresses the established gap. Chapter 3 presents the methodology of the research, the research design and procedures, ethics, and the approach taken to analyse the data.

Chapter 3 - Methodology and Research Methods

"Choosing mixed methods research combines the strengths of each methodology and minimises the weaknesses."

(McKim, 2017, p. 213)

3.1 Introduction

In this chapter, the rationale behind the research methodology in addition to the key methods of the study itself is discussed. A mixed method approach was selected to collect quantitative and qualitative data from students and teachers of additional languages in two Queensland secondary schools. This chapter outlines the research design, participant and research site selection processes and rationales, data collection methods, and the approach to the data analysis, followed by the findings in Chapters 4, 5, and 6.

3.2 Ethical Clearances and Approvals

This research was deemed 'low risk' to participants, and the anonymity of all participants was preserved by the de-identification process in all data collection phases. This project received Curtin University Human Ethics Committee approval (Approval Number HRE2020-0596), in accordance with the *National Statement on Ethical Conduct in Human Research (2007)* (National Health and Medical Research Council, (2007), and approval from the Brisbane Metropolitan Region of Education Queensland to proceed (date of receipt 24 August 2021).

3.3 Approach to Research

3.3.1 Methodology

The research is framed by the pragmatist paradigm and its associated research traditions that refute the superiority of one data type over another and allow for multiple and mixed methods of data collection (Dawadi et al., 2021). It is also an example of a phenomenologically-orientated and heuristic inquiry as student and teacher perceptions of their *lived* experiences were explored (Patton, 2002; Seidman, 2019). Therefore, the participants' subjective meanings, interpretations, and understandings of the phenomena under investigation were the focus of the investigation (Patton, 2002). Epistemologically, the research is positioned in the pragmatist paradigm wherein knowledge is understood to be based on experience, and with that experience comes perspective and opportunities to re-imagine ideas and approaches to problems (Wills & Lake, 2021). As such, the research design was premised on the notion that an understanding of the research problem will be realised by collecting participant experiences in multiple and varying forms (Creswell & Creswell, 2018; McKim, 2017). A case study, mixed methods research design allows for in-depth exploration through survey (questionnaire), observations, and semi-structured interviews to capture participants' perspectives, subjective experiences, and the social processes that shape their perceptions and realities.

3.3.2 Philosophical Approach

The initial philosophical approach to this case study was from a constructivist perspective due to the researcher's wish to understand the research 'problem' and

be guided by the participants' views of the topic (Creswell & Creswell, 2018). However, as the researcher's position was as a practitioner-researcher, upon establishing that the desire to utilise the information gathered was to garner new knowledge, identify the 'need', and then create and propose an intervention as a workable solution, it was established that the philosophical approach was more closely aligned with a pragmatic epistemology (Creswell & Creswell, 2018; Wills & Lake, 2021). This is due to the emphasis that pragmatic researchers place on using multiple (or mixed) methods to examine the *what*, the *how*, and the agreement that research will occur in and be influenced by various contexts (Creswell & Creswell, 2018; Olshewsky, 1983). As a pragmatic practitioner-researcher, the researcher was committed to problem-solving, building the capacity for others to act, and "tackling the problems of everyday life", and approaching research in a way that was "designed to be useful" (Wills & Lake, 2021, p. 5).

For a pragmatist, "quantitative and qualitative methods are viewed as capable of informing one another throughout the research process" (Hathaway, 1995, p. 539). Pragmatism as a philosophical approach to research has been used for over a century (Wills & Lake, 2021). Despite subservient popularity to analytical philosophical positions during the twentieth century, it again appears as a well-recognised orientation for contemporary social research, particularly within the humanities (Rorty, 1982; Wills & Lake, 2021). The power of the pragmatist approach lies in the flexibility of inquiry methods, and the coherence with emerging practices and ideas rather than the rigidity of other forms of enquiry.

Since the 1980s, academics such as Richard Rorty and Richard Bernstein (also referred to as 'neo-pragmatists') have drawn attention to the power of pragmatism

as a transformative philosophy, enabling social inquiry while developing work that impacts the community engaged in the research, and contributing to a potential solution to the problem – albeit a provisional one, until the work is reviewed again. Rorty's work, in particular, has been central in arguing for abandoning alignment to a central 'method' and leaving investigative processes open-ended (Rorty, 1991). To Rorty, "the whole idea of…choosing between 'methods'…seems to be misguided" (1982, p. 195), and therefore positions pragmatism as the perfect philosophical approach for a mixed methods investigation that works with a community (students and teachers) to investigate an issue with the intent of not only gaining understanding but for generating solutions that potentially create new knowledge upon which to act pedagogically.

3.4 Research Design and Participants

3.4.1 Case Study Approach

Case studies are often used when the nature of research investigations seeks to explore and answer questions, particularly when the researcher has a small participant sample, little control over events and when the investigative focus is on a contemporary, broader phenomenon (Williams et al., 2022; Yin, 2014). Case study was selected as the most appropriate investigative approach due to its focus on the collection of varied data over a sustained period to 'explore a phenomenon', and due to the desire that the outcome of the research produced a description and explanation of what was occurring (Ashley, 2017). The flexibility of case study research designs, rather than the rigidity of other models, makes them particularly

suited to school-based research where large, complex environments can introduce variables that may be outside the scope of the initial research plan. The researcher approached this investigation as a case study as the phenomenon to be investigated was situated within a real-life, multifaceted, and largely uncontrollable educational context, complicated even further by the advent of the COVID-19 Pandemic.

3.4.2 Mixed Methods Design

Consistent with many case study research designs, a mixed methods approach was used, specifically an explanatory sequential two-phase design (Creswell & Creswell, 2018; Dawadi et al., 2021) to enable the collection of a variety of data, followed by data triangulation and the additional insight afforded by cross-analysis (Cohen et al., 2017; Patton, 1999). The use of method triangulation, or the use of multiple methods to collect qualitative data on the same phenomenon (Carter et al., 2014), increases the validity of the data by allowing for different perspectives that could be overlooked if the collection methods were the same (Morse, 2009). Both quantitative and qualitative approaches to data collection have strengths and weaknesses; however, as McKim (2017) emphasises, mixed methods research enables the combination of the strengths of each methodology, and therefore, the weaknesses are minimised. To answer the research questions confidently, data collection methods had to be combined to include one quantitative (survey) and two qualitative methods (observation and semi-structured interview). This combination, particularly with a smaller participant sample, offered the researcher the "best chance of answering research questions by combining two sets of strengths while compensating … for the weaknesses of each method" (Dawadi et al., 2021, p. 27).

3.4.3 Data Collection Procedures

Survey

A survey was the first data collection method used in this research to provide a primary cross-sectional, quantitative overview of teacher and student opinions, attitudes, and actions, with the view that these insights could provide an initial explanation of how the issues under investigation are linked (Creswell & Creswell, 2018; Williams et al., 2022). The survey had the largest sample size, and as it was delivered online, enabled participants to contribute data to the study quickly and efficiently, successfully mitigated COVID-19 contact restrictions, and minimised teacher administration responsibilities (see Appendix 1 and 2). The survey was cost-effective, convenient, and enabled data to be collected, accessed, and analysed quickly. As an initial data collection instrument, the survey was selected as there was no interviewer, and so mitigated any interviewer effects that may have impacted participants' preparedness to answer questions honestly (Williams et al., 2022).

Pilot Survey

In early April 2020, before any COVID-19-related lockdowns or significant COVID-related impacts on school systems, a pilot survey with a school not involved in the study was planned. This trial was intended to add to the reliability of the instrument and subsequent data, test the interface of the data collection instrument, and gather feedback on its appropriateness for students and teachers. As the impact of COVID-19 on schools intensified, all but one of the Independent schools that had indicated a willingness to participate in the study withdrew, citing curriculum complexities,

staffing issues, and staff and student wellbeing concerns. This resulted in an urgent request for research approval from Education Queensland so that government schools could also be approached. Despite gaining these approvals via an additional ethics application, government schools were reluctant to participate for the previously cited reasons. To continue progressing with the study, the only option at that time was to include the researcher's workplace as the second school. For this reason, the data instruments were not used in a pilot study with students as initially intended.

The teacher survey was piloted with teaching colleagues outside additional languages education to ensure that the structure and language were clear, the questions were unambiguous, and that the survey was easy to engage with, complete, and appropriate for topic and context. After the initial items to obtain demographic information, each question in the survey was aligned to one of the five key research questions driving this study. Following the pilot survey, it was determined that the questions were lengthy and required more neutral language to avoid influencing the participants in their responses (Chyung et al., 2018). Another deliberate strategy for maximising validity in the survey was presenting participants with positively worded statements, rather than questions that combined both positive and negative language, to avoid participant confusion and to minimise the cognitive load for respondents (Chyung et al., 2018).

After the researcher discussed the limitations of the questions with her colleagues and supervisors, it was decided that the questions would be rephrased into statements requiring a response on a 5-point Likert Scale, assumed as an interval scale, with the distance between each interval being equal (Chyung et al., 2017). This

step minimised the ambiguity of responses and subsequently simplified the analysis. Sliding scales and reactive emojis were incorporated to make the survey more appealing to the participants, and 'yes/no' questions were avoided and rephrased as 'to what degree' questions to provide more scope for participant responses. Following some questions that required a response on a Likert scale, open questions were included, allowing the respondents to provide additional information that supported their selection in the preceding question. The questions were as similar as possible for students and teachers so that they could inform the creation of questions for the semi-structured interviews in Phase 2.

The decision to include a mid-point in the Likert Scale survey questions was also considered in detail as its inclusion has been contested for some time, with both 4- and 5-point scales having benefits and issues (Chyung et al., 2017; Williams et al., 2022). While a 4-point scale was considered as a way of removing a neutral midpoint where minimal information is disclosed, the likelihood of producing biased data due to forcing the students to choose one side of the scale was deemed inappropriate by the researcher and her supervisors for this survey (Chyung et al., 2017). The 5-point scale was used to enable students to express a neutral opinion if they wished, to select a midpoint if they were uncertain about the meaning of the survey items, and to use the scale for statistical analysis (Chyung et al., 2017). To minimise the risk that students would select the mid-point as an acceptable response without giving the other options due consideration, all students were communicated with before surveying to emphasise the importance of answering questions honestly and with due consideration. This was done using a video recording, played to the whole class (School A), or provided to students as a link to view before taking the survey (School

B). Ensuring that all students received the same message increased the reliability of the responses. While not promoting the 'neutral' position, the video message encouraged students to choose this option if the subsequent information in the open-ended question explained their position – and this information was used to finalise the semi-structured interview questions.

Survey terminology was also reviewed following the pilot and discussed with teachers from other learning areas. It was decided that the term 'learning technologies' would be used when referring to any device or digital learning program to keep concepts and the language around these concepts consistent. It was also determined that, given the age of many participants in the study, the term 'metacognitive awareness' in the initial set of questions could be confusing or ambiguous for participants unfamiliar with the definition used in the research project. To address this, the questions were rephrased in terms of "how aware students are of the way they learn languages" so that respondents did not have to grapple with academic definitions, unnecessarily complicating the data collection procedures.

Observations

In addition to the survey, whereby the collected data provided an initial insight into the participants' thoughts, attitudes, actions, and beliefs, classroom observations provided the researcher with the opportunity to see whether what was said could be confirmed in the field, relating their behaviours to their physical environment and context of additional languages education (Mulhall, 2002). Structured, descriptive classroom observations were planned to capture student and teacher interaction

data and their use of learning technologies in more natural circumstances (Mulhall, 2002; Smit & Onwuegbuzie, 2018).

As the researcher was working as a complete observer (a non-participant, but the role was known to the participants) and collecting data in two schools, one of which was the researcher's workplace, an observation protocol (Creswell & Creswell, 2018) was created to focus the researcher's attention on key aspects of student and teacher resources and classroom activities (see Appendix 3). The initial section of the protocol was structured to record descriptive notes (regarding demographics, equipment, and activities) using tick boxes for consistency and ease of completion, and to prioritise notetaking for observed behaviours and interactions rather than static information. The second section of the protocol was unstructured to collect reflexive notes, such as those relating to student and teacher behaviours, and any impressions, ideas, questions or hunches collected during the observations (Bogdan & Biklen, 1998). So as not to disrupt any behaviours during the lesson, the researcher only asked the participating student or teacher questions at the end of the lesson when further clarification as to why they behaved in a particular way was required.

Semi-structured Interviews

The semi-structured group interviews were planned as the final data collection event. Their inclusion in the study was to understand better the participants' lived experiences and the meaning they make of their experiences (Seidman, 2019) in this case, using and interacting with learning technologies when studying additional languages and determining whether students were metacognitively aware. Using semi-structured interviews in this study enabled the researcher to put behaviour into

context, ask explicit, pre-determined questions, and, where necessary, elicit further information from the participants to better understand their subjective experiences. The interviews took place with different groups over 30-45 minutes each time. The consistency of questions was essential to enable comparison when the data was compiled. Preparing for the interviews with a structured, focused set of questions also compensated for the researcher's lack of experience interviewing, minimised variation between the events, and prioritised the questions that needed to be answered (Patton, 2002). The actual questions asked of teachers and students were designed to obtain information that supplemented both the initial survey and the observations so that any 'gap' between what participants said and did could be better understood (Gibbs, 2017) and links between the data obtained and the research questions could be ascertained (see Appendix 4 and 5).

3.4.4 Participants

The schools initially chosen for this research project were Independent schools in Queensland, both single-sex and co-educational, as these sectors differed from the sector within which the researcher worked. Criteria for selecting the schools focused on students studying additional languages at an entry level (Queensland Year 7) and continuing into Senior Secondary level (Queensland Years 10 – 12). The schools invited to participate were interested in integrating learning technologies into additional languages education, and using the insights gained from the research to understand their current practices and identify opportunities for both students and teachers to improve. The rationale for selecting Independent schools in Queensland stemmed from the researcher's experience working in an Independent school for

many years and seeing first-hand the degree of autonomy these schools had in driving school policy regarding the use of learning technologies in schools. This differed significantly from the administration of systemic schools within the Government, Catholic or smaller religious organisations as they had less autonomy and, in many cases, fewer resources. To compare schools and the experiences of their students and teachers, it was important to recruit schools with similar educational contexts, and this was more likely pursuing schools in the Independent Sector.

Many Independent schools expressed interest in the study. However, due to COVID-19 lockdowns, remote teaching, and the subsequent need for vast amounts of digital material, the logistical and cognitive load for school staff and students resulted in a lack of willingness to commit to ongoing participation. Only one Independent school participated, and data collection from School A commenced as soon as possible as it could be completed remotely. During this time, the researcher negotiated with Education Queensland to approach its schools within the Brisbane Metropolitan Region. Following approval from Education Queensland, five schools were invited to participate in the research. One school, known as School B, consented. The researcher is an employee of School B, which was ameliorated throughout the study by excluding students she taught personally from the sample group, and minimising her interactions with the participating students so that she presented more as a researcher than a staff member.

3.4.5 Ethical Considerations

Before recruiting participant schools and individuals, the researcher carefully considered her ethical approach to this study, and how participants' rights, needs,

values, and their willingness to participate would be respected (Creswell & Creswell, 2018). Although deemed to be 'low risk', any research with students and teachers was likely to be somewhat intrusive, so processes were put in place to minimise the impact on those involved. The researcher's actions were informed by and consistent with the guidelines contained in the National Statement on Ethical Conduct in Human Research (The National Health and Medical Research Council, 2007 (Updated 2018)) and included the following:

- Obtaining written HREC and Education Queensland approval to proceed with the research.

- Written Information Statements for prospective participant schools, teachers, and students were provided before any agreements were made. These statements outlined the research objectives, the data collection processes, and how the data would be used.

- Participation in the study was voluntary at the school and participant level.

- Informed consent was gathered via the collection of written Consent Forms, and participants indicated data collection events to which they consented. The only part of the study some participants were not willing to agree to was having audio recorded during the semi-structured interviews. These students received an invitation to a semi-structured interview session that promised no audio recording, but all declined. The participants' rights and wishes were respected when reporting the data.

- Participant anonymity was preserved by removing names from any documents used outside the research. No participants were video recorded. Voices were

recorded using audio only, and any transcripts made available to participating schools had names removed.

- The potential conflict of interest as an employee of the second participant school and the strategies to mitigate this were addressed to the Principal of School B (as the researcher's employer) before any research started, and support from the Principal was obtained before an ethics proposal to Education Queensland, which later gained approval.

- The researcher's positionality in the research was acknowledged and managed as much as possible. Participants were made aware of the researcher's position within School B but were encouraged to separate their involvement with the study from their work. At School B, no students taught by the researcher were permitted to participate in the study so as not to directly subject them to any bias or unconscious direction to answer the survey and interview questions in a way that reflected their experiences with the researcher in the classroom. The researcher separated her role as a researcher from her role as a middle manager at the school to the best of her ability. While it was challenging to minimise interaction with the participating staff at School B, the researcher was able to minimise her interaction with the participating School B students.

3.5 Final Case Study Schools and Participants

The following section provides a detailed description of School A and School B and the participants from each school community. Information relating to each school has been sourced from the *MySchool* website (Australian Curriculum Assessment and Reporting Authority (ACARA), 2023b), as it provides public data, and from the school

websites directly, as they have provided school data, although not necessarily the same variety or breadth of data. To preserve school anonymity, these sites have not been referenced.

School A

School A is an independent Catholic College for boys within Brisbane, established in the 1950s. It caters to young men in Years 5 to 12, and currently has a college population of over 1700 students. The school's Index of Community Socio-educational Advantage (ICSEA) is currently 1081, and its school ICSEA percentile is 79, indicating that students are educationally advantaged. This school has 145 teaching staff and 89 non-teaching staff and teaches one additional language – Japanese. In 2022, this school reported that 2% of its students spoke a language other than English at home, and 3% identified as Indigenous. In 2021, School A reported that 78% of its Year 12 cohort received an Australian Tertiary Admission Rank (ATAR); from that group of students, 8% received an ATAR of over 99. One student was among the top 32 students in the state, receiving the highest ATAR result possible – a 99.95. In 2022, the school reported that 99.5% of the students attained their Queensland Certificate of Education (QCE), 75% were ATAR eligible, and 170 completed a Vocational Education Training (VET) qualification. The school admissions team manages enrolment in this school, and eligibility is not restricted to the local catchment.

The core device used by all School A students in Years 5-12 is a Windows laptop provided by the school, including the Microsoft suite of programs. This technology is "used as a tool to enhance creativity across a range of learning areas" (Secondary Parent Handbook) and "issued for the sole purpose of improving your

(the student's) learning experience" (Year 7 Student Handbook). Key programs incorporated into the school program include *OneNote* and *Education Perfect*, which share resources between staff and students. It is unclear from school information whether there is a digital workflow process that teachers and students are expected to follow.

School B

School B is a government secondary school in central Brisbane, established in the early 1900s. It caters to young men and women from Years 7 to 12 and currently has over 3400 students. The school's ICSEA is currently 1151, and its ICSEA percentile is 95, indicating that students are quite educationally advantaged. In 2022, the school reported that 52% of its students spoke a language other than English at home, and 1% of its students were Indigenous. This school has 232 teaching staff and 87 non-teaching staff. The school offers six additional language subjects to its students – Chinese, French, German, Italian, Japanese, and Spanish. Any student living within the catchment is eligible for admission, and many out-of-catchment students compete for admission by applying for academic, sporting, or cultural merit. This results in many students on merit entry commuting to the school from all over the city.

School B is widely known for its exceptional Senior results and, in 2021, was the only government school where students achieved an ATAR of 99.95, and this was true again in 2022. Of the 30 students in the state who achieved a 99.95, six of them were from School B and in 2022, this number increased to 10 students, the highest

number from one school in Queensland. In 2022, 96% of the Year 12 students received an ATAR; of these, 15% received an ATAR of 99 or above.

The core technology device at this school is an Apple iPad and iPencil. The school provides the minimum specifications for the device, which must be purchased by each family privately and used throughout Years 7-12. In addition to the technological requirements, this school has a clearly articulated IT workflow that involves a series of applications that enable the distribution of curriculum resources and instructions, digital spaces for students to complete work, and applications for students to submit work to teachers for feedback. Students are provided with digital textbooks rather than hardcopy. Key school iPad applications include *Canvas* (or *QLearn* as it was referred to from 2023), a Learning Management System for distributing materials and lesson instruction, *Education Perfect*, *Padlet*, *Inspiration Maps* and *Showbie*.

School Participants

Collectively, 38 students and 14 teachers consented to participate in the study. Thirty students participated in the survey, 21 in the observations and 18 in the semi-structured interviews. Fourteen teachers agreed to participate; 10 participated in the survey, five in the observations and eleven in the semi-structured interviews. Participant data is summarised in Table 1.

Table 1

Summary of participants at each data collection point

DATA COLLECTION POINTS	SCHOOLS AND PARTICIPANTS			
	School A		School B	
	Students	Teachers	Students	Teachers
Total Participants	15	5	23	9
Survey	9	5	21	5
Observations	14	1	7	4
Semi-structured interviews	9	4	9	7

Participating teachers were approached by the respective Heads of Department in each school and asked to consider volunteering for the research project. Students were recruited following a different process in each of the schools. These processes were determined by the resources available to the schools at the time and how suitable for participation they believed certain Year Level groups to be.

The Head of Department at School A decided that only Year 10 students would be invited to participate, as studying additional languages was an elective and therefore involved fewer students. The teachers at the school were concerned that the administrative task of involving the Year 7 students (where additional language study was compulsory) would be too great. The Information Statements and Consent Forms were provided to the Year 10 students via the Head of Department – Languages, and all members of the Year 10 class offered to participate. After the Consent Forms were returned, the researcher shared the online survey, and the teacher asked the students to complete the survey as an in-class activity, albeit individually. While not evident in student responses, completing the survey in this

way might have been a limitation if students spoke to each other about their answers to the survey questions. Staff completed their Consent Forms and, subsequently, the online survey individually.

At School B, a request for student volunteers was sent to all students in Years 7 and 10 via their classroom language teachers, except my Year 10 class. The link to the online survey was sent to each student as they returned their signed Consent Form, and they completed the survey individually and in their own time. Additional language teachers were asked to consider volunteering via email to minimise my influence by requesting in person. The limitations of these recruitment strategies will be discussed later in this chapter.

3.6 Conduct of the Research (Research Phases)

The mixed methods design, specifically the explanatory sequential two-phase design, enabled the combination of quantitative and qualitative data, and afforded more data points to explore the phenomena in question in great and more nuanced detail (Creswell & Creswell, 2018).

Complications arising from the COVID-19 pandemic impacted the order of the data collection points, and so while the initial intent was to have the Phase 2 semi-structured interview questions informed by the survey and observations, they were informed by the survey only. The observations occurred in Phase 2 and were treated as a standalone data set used to triangulate the results from the other events (see Figure 3).

Figure 3

Planned vs. actual data collection sequence

(Planned) Phase 1 Survey and Observations	→	Phase 2 Semi-structured interviews
(Actual) Phase 1 Survey	→	Phase 2 Observations and Semi-structured Interviews
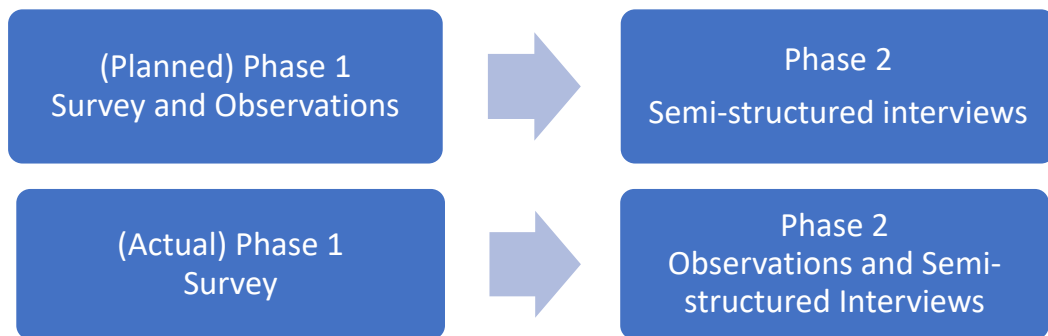
The initial quantitative data collected in the survey identified student and teacher behaviours and perspectives; however, the findings were generalised, and the only detail was contained in the open-ended survey questions. The data collected through the qualitative observations and semi-structured interviews were smaller in quantity; however, they provided a deeper understanding of the issues being investigated and elicited more detail from the participants. The difference in participant numbers during each phase was noted but not considered problematic, as the smaller qualitative and more significant quantitative components supported an in-depth and rigorous quantitative and qualitative examination of the research issue (Dawadi et al., 2021). By triangulating the collected data, validity was tested through the convergence of information from the different data sources (Carter et al., 2014), and the credibility of the findings from a singular approach was strengthened (Dawadi et al., 2021).

3.6.1 Phase 1 - Surveys

Phase 1 data collection commenced with School A, while additional ethics approval was sought to include School B. As only one Independent School had agreed to participate, it was necessary to amend the Curtin University Ethics application to include Queensland Government Schools. To approach these schools, a separate application was required by Education Queensland. This application was made while the Phase 1 survey data was collected from School A.

School B was approached only after permission from Education Queensland had been obtained. After it became clear that other independent schools approached for participation in this study were not able to partake, the inclusion of this school was discussed with the research team. It became clear that including the school enabled the research to be conducted in a timelier manner.

Online Survey

The items in the survey were developed to align with the five focus questions of the case study. After reviewing the first draft of the questions, the presentation of the Likert Scale was altered to be a sliding scale or, in some cases (particularly for the student survey), a changing emoji face representing the scale to make the interaction with the survey easier.

Once complete, all Qualtrics responses were exported into Microsoft Excel. The small participant sample, differences in participant experience, and the response rate had implications for how the data was analysed. One spreadsheet was created that represented the data from both schools. This spreadsheet enabled simple descriptive analysis of the primary cross-sectional data and is presented in Chapter 4.

However, it was evident prior to collection that the likelihood of statistical significance or correlation between variables in this data set was low due to the small sample size. The holistic data did, however, enable the identification of potential trends that warranted further exploration in the subsequent observations and semi-structured interviews.

Other spreadsheets were created to align with the research questions. The questions in the survey pertaining to each research question were examined individually and as a group to reach conclusions about variables, such as differing behaviours between schools, differences between language types (e.g., European vs Asian languages), and any discrepancies related to student age or gender. This data was also used when triangulating the data obtained in the observations and interviews to determine trends and areas for further investigation.

3.6.2 Phase 2 – Observations and Semi-Structured Interviews

Observations

During the observations, the teachers and students were observed simultaneously. The possibility of the researcher's presence being intrusive was considered and therefore strategies were put in place to minimise this. Before the observations commenced, the researcher carefully considered her physical position in the classroom when conducting the research. Her role as a researcher was known to all participants; however, it was important that she remained a non-participant in any class being observed as, at School B, she was also known to participants (both teachers and students) as the Head of Department for Languages.

The Hawthorne Effect, where "research participants act in a way that is consistent with their perception of the researcher's expectations during a study (Franz, 2018, p. 768), thereby biasing the outcome, was a distinct possibility, particularly at School B. To minimise the possibility of this occurring, the researcher limited her spoken and physical interaction with the classes and sat quietly at the back of the room when conducting observations. The teachers acknowledged the researcher's presence, stating only that they approved her attendance in the class but did not reference why she was there or what behaviours she was observing. Despite being visible to all, the researcher was as unobtrusive as possible. In all classes, within the first five to ten minutes, she saw behaviours described by students and teachers in the survey when there was no observer, indicating that the behaviours were natural and not forced. Another factor that potentially limited the Hawthorne Effect was the unplanned length of time between the survey and the observations due to COVID-19 restrictions, and so, by the time the researcher physically positioned herself in classrooms and spoke to students after the observations had taken place, many students told her that they had not made the connection between their initial survey participation and her visit to observe them in their classes. Although there is no way of knowing definitively, there was no behavioural indication during the observations that the researcher's presence influenced the behaviour of the teachers or students.

The final mitigation strategy to minimise the Hawthorne Effect or any other potential biases in the observations was by triangulating observational data with the other two data sources, in this case, the primary survey and the semi-structured interviews.

Semi-Structured Interviews

The researcher's approach to interviewing was phenomenological focusing on the participants' lived experiences and the meaning they make of these (Seidman, 2019). The flow of the line of questioning could be controlled to obtain further insight into the perspectives and attitudes of those the researcher had observed and those she had not (due to absenteeism on the day of observation). Interviewing as a teacher-researcher was important as the researcher wanted the participants to feel that their perspectives and experiences were important and valuable, and could contribute to pedagogical and experiential change. The researcher wanted to hear about the participants' experiences in their own words and "capture the complexities of their individual perceptions and experiences" (Patton, 2002, p. 348).

Asking participants about their lived experiences was difficult for the researcher, particularly when they had not noticed why they behaved in specific ways or why they perceived ideas and their related behaviours in particular ways. Her role was to guide the participants through the semi-structured interview questions in a conversational way that put them at ease and enabled them to recount and reflect on their experiences, providing the researcher with language that she could transform into text for analysis (Seidman, 2019) and then triangulate the compiled data against that collected in the observations and survey.

Teachers and students were asked between 12 and 14 questions that related to their experiences using learning technology with additional languages education: whether or not participants felt that student achievement was linked to learning technology use, perceived supports provided by learning technologies, personal preferences regarding learning technology use, engagement with the curriculum

when accessing by learning technologies, perceived links between learning technology use and metacognition, and finally the validity of feedback from learning technology programs. These questions can be found in Appendix 4 and Appendix 5. As individual survey responses could not be identified, responses were generalised and posed to interview participants. For example, *"In the survey, all teachers indicated that their students' knowledge of additional languages in some cases is largely because of using digital technologies - can you please explain why you think that is?"* For consistency, student and teacher groups were asked the same questions, with minor adjustments to account for their role in teaching and learning processes. Each group was invited to elaborate on their responses if they wished, or asked for further information if more specific information was needed to make sense of the responses. At the end of each interview, the researcher also asked the participants of each group if there was anything else they wished to comment on that was related to the topics discussed and that they felt was important.

The first group to participate in a semi-structured interview was the staff group from School A, who completed the interview online as physical access to the school at the scheduled time was not possible due to COVID-19 restrictions. Students from School A and staff and students from School B completed their semi-structured interviews throughout 2022. All interviews were conducted within 30 to 45 minutes, recorded digitally, and transcribed initially using Otter AI, a speech to text transcription application that uses artificial intelligence and machine learning. The ethical considerations of using a program such as this were also discussed with the research team as these related to data management. All transcripts were reviewed, and where errors had occurred in the transcriptions, the researcher corrected them

in the program. Otter AI also assisted in the identification of keywords within and across interviews, and tagged areas within each conversation that related to specific content. The researcher examined each transcribed interview to look for relationships between the participants' responses. Individual responses to questions from each interview were also selected, and examined collectively to look at response rates and identify the frequency of themes, topics, and perspectives. Selective coding (Fraenkel et al., 2018) was used to examine the responses according to themes and ideas within the pre-determined questions. Inductive coding (Fraenkel et al., 2018) was used to group ideas that came about through the discussions but were not necessarily directly related to the prepared question and may have been more relevant to another or an entirely new idea that had not been expected (Patton, 2002).

3.7 Reliability and Validity

The researcher made every effort to maximise the reliability and validity of this study; however, it is important to acknowledge that researcher biases may have shaped how the data was interpreted, viewed, and analysed (Fraenkel et al., 2018; Mulhall, 2002). The researcher's work as a teacher and middle manager at School B made acknowledging these biases and managing data collection processes within these more important to minimise any potential influence on the collected data. Strategies to preserve the researcher's objectivity in the work and maximise the validity of the work were discussed at length with the research team. Factors considered included those related to quantitative and qualitative data collection, environmental factors, participant bias, the researcher's own bias when interpreting the data, the

researcher's positionality in the research process itself, the varying abilities of the participants to articulate their responses, and the impact of the researcher's physical and occupational presence on participant bias (Creswell & Creswell, 2018; Patton, 2002).

Efforts to address and minimise researcher bias included collecting data in three separate events and including differing data types to enable triangulation, a strategy widely used to validate qualitative research (Williams et al., 2022). The researcher's role as a staff member at School B was acknowledged prior to data collection and it was explained to all participants (and their families in the case of students) that the research was independent of any school-related activities or reports. While participants were identified during the interviews for clear communication, participants were de-identified in the transcripts and subsequent data sets. To negate the possibility of social desirability bias, the provision of perceived socially acceptable responses as opposed to truthful responses (Fraenkel et al., 2018) and the Hawthorne Effect (Franz, 2018), participants were encouraged to speak and behave openly and honestly without fear of identifiable data being used within either school.

3.8 Limitations

While all efforts were taken to minimise limitations in this study, they must be duly considered and acknowledged. The most significant limitations of this study relate to its educational context, sample size, and composition; however, limitations also relate to the study's methodology.

The original intention for this study was to involve a range of differing Queensland school types. Despite being from different educational sectors, the two participant schools are both educationally advantaged and are therefore not generally representative of all Queensland schools, resulting in sample bias or lack of generalisability to the wider group of schools. The privileged educational environments of both schools and the participants' school experiences may limit the perspectives of student and teacher experiences to those who access schools with higher ICSEA ratings. While these perspectives and experiences remain valid, they are likely not representative of student and teacher experiences across Queensland. This is also true of the individual participants, as the voluntary nature of participant involvement was a limitation. Participants, particularly the students, were more likely to be involved if they were interested in the topic or were encouraged to participate by their teachers or families.

Issues with sample size also generated some conceptual limitations that must be acknowledged. Within the small sample, the inclusion of two schools that, despite similar ICSEAs, were vastly different in terms of student population and subjects offered resulted in some variables being unable to be compared across schools, such as gender and comparisons made by the language studied. For that reason, the group was often reported on as a whole when analysing the data. It is also noted that the sample size was small and therefore, the findings should not be carelessly generalised across populations. Despite this, the responses indicated some trends that can be acted upon or explored in further detail.

There were discrepancies in terms of the way in which data was collected in this study, and these discrepancies were due to the impact of the COVID-19 pandemic

and school decisions relating to how data was collected and who would contribute. Physical limitations on school visitors during the 'lockdown' phase of the pandemic meant that observations were not able to be conducted at School A prior to conducting the semi-structured interviews, and so the intended order of the data collection phases was impacted. School A's decision to limit participation to Year 10 students only and to ask all students in the class to participate, rather than making participation voluntary, also affected the scope of the study, but by making participation compulsory, the perspectives of students who might not have volunteered were able to be captured in the data.

The timing of data collection was an additional limitation of this study. It, too, was related to the impact of COVID-19 onsite access rather than due to the schools' cooperation. COVID-19-related lockdowns and student absenteeism due to illness or compliance with government regulations delayed data collection and the order in which data was collected. The time between the initial survey, the observations and the semi-structured interviews was significant.

3.9 Summary

In this chapter, the methodological approach to the study was outlined, including detailing the epistemological approach, research design, data collection instruments, and procedures. The study participants were introduced and important contextual details to consider when interpreting the results were provided. Finally, factors relating to the reliability and validity of the study were outlined and potential limitations were identified. In the following three chapters, the data collected in each

of the events is presented as well as key findings that relate to the overarching

research questions.

Chapter 4 - Survey Findings

"A quantitative approach of data collection can bring breadth to the study by supporting the researcher with accumulating data about different aspects of a phenomenon from different participants."

(Dawadi et al., 2021, p. 27)

4.1 Introduction

In the study's first phase, all participants were invited to complete a survey electronically (see Appendix 1 and Appendix 2). The survey consisted of 36 (students) or 37 (teachers) questions to elicit quantitative and qualitative data. This chapter first elaborates on the quantitative component of the survey, and then the qualitative findings are presented. Descriptive analysis was used for the quantitative data responses, with responses reported in frequency and percentages where relevant. Qualitative responses were coded, and themes were developed, which provided further insight along with the quantitative data. Due to the study's sample size, data has been generally treated as a single unit of analysis; however, where trends were evident across year level, gender, or due to school differences, this has been highlighted. *Key Findings* are highlighted after each section as a summary statement for ease of reference.

4.2 Student Survey Responses – Overview

Combined, 30 students from schools A and B responded to the survey. Table 2 aggregates the gender profile, and Table 3 shows the student year level by school and gender.

Table 2

Participant Numbers by School and Gender

SCHOOL	STUDENT GENDER			
	Male	**Female**	**Not specified**	**Total**
SCHOOL A	7	0	2	9
SCHOOL B	5	16	0	21

Table 3

Participant Numbers by Year Level at Time of Survey Completion

SCHOOL & GENDER	YEAR LEVEL	
	Year 7	**Year 10**
SCHOOL A MALE	0	9
SCHOOL B MALE	4	1
SCHOOL B FEMALE	10	6

From School A, nine Year 10 students responded. Seven students identified as male, and two did not specify their gender. From School B, 21 students volunteered to participate in the survey. Responding to the question regarding gender, 16 identified as female and five as male. In the male group, four students were in Year 7 and one in Year 10. Of the 16 girls participating, ten were from Year 7, and the remaining six were from Year 10.

All nine students at School A were students of Japanese. In School B, participants studied at least one of Chinese, French, German, Italian, Japanese or

Spanish. Table 4 represents the languages studied by participants in each respective year level across both schools.

Table 4

Participant Numbers by Year Level and Language Studied

SCHOOL	LANGUAGE					
	Chinese	**French**	**German**	**Italian**	**Japanese**	**Spanish**
SCHOOL A	0	0	0	0	9 (Year 10)	0
SCHOOL B	1 (Year 10)	2 (Year 7) 2 (Year 10)	1 (Year 7) 1 (Year 10)	2 (Year 7)	5 (Year 7)	4 (Year 7) 3 (Year 10)
TOTAL	1	4	2	2	14	7

When asked whether learning technology use was compulsory, 21 students from School B answered that it was compulsory; however, students from School A indicated an almost even split between optional and compulsory. Despite both schools having mandatory learning technologies integrated into teaching and learning programs, these figures reflect the students' interpretations of the schools' policies, and potentially how stringently these policies are applied by their teachers and followed by the students in each school.

4.2.1 Learning Technologies' Influence on Student Learning, Agency, and Engagement

Students were asked to rate their enjoyment of studying additional languages on a 5-point scale. Twenty-eight of the 30 students who answered this question responded a *high* to a *very high* level of enjoyment. Reasons for this varied, and most students attributed their joy of language learning to multiple reasons. Personal interest in the

target language was cited as the primary reason the student respondents enjoyed learning languages. Other reasons for learning a language included it being 'fun' (31%), 'interesting' (21%), and a love of or curiosity about the cultures of the target-language speakers (24%). The teaching environment and teacher engagement were also reasons attributed to a joy of learning a language (31%). Comments included statements that peers were "friendly" and that teachers were "enthusiastic and passionate", and "very good at explaining things to us in a way we understand". Only one student linked their language study to favourable scaling for the Australian Tertiary Admission Rank (ATAR). Interestingly, except for one response that cited "interactive" resources, learning technology use was *not* associated with a joy of learning languages. The absence of learning technologies in the student responses does not necessarily mean that learning technologies were not a significant engagement factor for students, but not necessarily an engagement factor of the highest importance.

Students were asked to indicate their level of agreement with the statement, "the language I am learning is easy." Responses are shown in Table 5.

Table 5

Participant Responses Regarding 'Ease' of Language (Item 15) and Self-Assessment of Academic Performance (Item 20)

ITEM NUMBER	STUDENT RESPONSE					
RESPONSES ITEM 15 (N=29) *LANGUAGE IS EASY*	Very easy	Easy	Neutral	Difficult	Hard	No response
	6	7	8	3	0	5
RESPONSES ITEM 20 (N=30) *RATE MY ACADEMIC PERFORMANCE*	Excellent	Advanced	Good	Average	Poor	No response
	13	0	14	3	0	0

Across both schools, of the 29 students who responded, thirteen indicated that learning languages was *easy* or *very easy*, eight selected a *neutral* position on the sliding scale, and three said it was *difficult.* Five students did not select a response. Four students from School B and one from School A did not respond to the question; however, four students (all from School B) provided additional information in the 'Why?' question that followed (Item 16). The additional information provided by these students all related to the challenges of studying languages, specifically mastery of grammar (2), comprehension (1), and difficulties associated with identifying linguistic nuance (1). An additional 13 students were either non-committal or did not respond to Item 15.

All students responded to Item 20, which asked them to rate their academic performance regarding learning additional languages. Despite their reluctance to indicate their agreement with the statement about the ease of learning the language they chose, eleven of these students assessed themselves as ranging between *good* and *excellent* in terms of their academic performance. Only three of the 30 students rated their academic performance as *average*, indicating that, although some students find their language study challenging, their perceived challenges do not significantly impact their self-assessment of academic performance. With regard to the student responses to Item 20, all 30 students rated their academic performance when learning a language between *average* and *excellent.*

In the information drawn from the qualitative responses that followed Item 15 (Item 16), twelve of 29 students referenced that learning an additional language is "hard". Of the students who indicated this, 11 were students of Asian languages

(Chinese or Japanese), which may represent the additional challenges of learning Asian characters. Where the language learnt had a similarity to English, such as French, Italian, Spanish, and German, this similarity was given as the reason nine students selected *neutral*, *easy*, or *very easy.* Teacher contribution was the reason given by two students, with one writing, "it is easy to learn because our teacher teaches in a way that helps me learn better." A learning technology application was only mentioned by one student, and this was in conjunction with how it was used with and by the classroom teacher.

Tethered to students' perceptions of their academic performance was a belief that their expertise in using digital technologies for language learning (Item 19) was well above a beginner level, with 28 of the students rating their expertise in using digital technologies for language learning between *intermediate* and *expert*. Nineteen students indicated that they believed their knowledge of additional languages was primarily based on their regular or constant use of digital technologies (Item 17), suggesting that learning technologies contributed significantly to students' perception of how they acquire knowledge of additional languages.

Key Finding 4.1 – Learning technologies factored little in students' reasons for engagement in additional language learning but contributed significantly to their perception of how they acquire knowledge of languages.

4.2.2 Student Interaction with Learning Technologies and Their Influence on Learning and Achievement

Regular vocabulary revision is critical to additional language studies, with or without access to learning technologies (Smith, 2018). Knowing that student survey respondents were all provided access to learning technologies, but with different school expectations regarding how central these were to the teaching and learning process, students were asked how frequently they self-tested their language learning using the testing features of web-based programs or applications (Item 21).

The frequency of this self-testing ranged from *once a term* to 'cram' for language assessments to *several times a week* to revise vocabulary, determine gaps in knowledge, and avoid judgement from parents and teachers. Of the nine students with less stringent school expectations around the use of learning technologies (School A), only one student indicated that they self-tested more than once a term. Similar responses were obtained from School B, where technology use is compulsory and a central part of the learning and teaching process; however, no student at this school indicated that their self-testing was to cram language content before assessments. Despite four students not qualifying their response with additional information, eight School B students stated that they self-tested frequently to revise vocabulary or to self-diagnose areas requiring improvement. The data, therefore, suggest that the frequency of self-testing is not significantly influenced by the educational context and school expectations concerning the use of technologies to support learning, but rather, influenced by student motivation.

To investigate the reliance on learning technologies and the impact that separation from these devices and programs can have, students were asked an open-

response question how they feel when access to learning technologies was *not* possible (Item 24). In the 30 responses, three students indicated that they felt no difference when without access to learning technologies while studying additional languages. Ten students indicated that learning additional languages becomes more difficult without technology, including responses such as feeling "less enabled" (Year 10, School B, Female, Student of Spanish), and that language learning becomes "difficult to access the tools and information needed" (Year 7, School B, Male, Student of Spanish). Another 10 students indicated that non-access forced them to move to one or more traditional language learning methods, such as writing notes manually in a book, on worksheets or flashcards, and experiencing face-to-face conversations in the target language with peers or with a teacher.

Of note, despite the question asking students to address their feelings, only seven students focused on how they felt. Within these responses, students indicated feelings of increased anxiety, frustration, and decreased confidence in their ability to retain and understand curriculum content. The potential fragility of students' well-being was suggested by one student, who stated that without access to her technology when learning languages, she felt "out of place and vulnerable" (Year 7, School B, Female, Student of Spanish), indicating the extent of her reliance on learning technologies for study. For students who did not address their feelings as instructed, their responses referenced how their work changed when unable to access learning technologies in ways such as writing more slowly, struggling to organise their work when it is not saved in a digital form and not knowing if their work is correct due to the absence of instant feedback. Students' responses also indicated that a lack of access to learning technologies made language learning less

enjoyable, less efficient, and less resourced and forced them to study in more traditional ways.

Key Finding 4.2 – Students link successful language learning with access to learning technologies, and separation from these can decrease student confidence, and increase feelings of frustration, anxiety, and vulnerability.

Students were asked to respond to the statement, "I become very distracted when using technology for additional language learning", to determine their awareness of whether the technologies they utilise in their learning could hinder their learning (Item 26). The number of student responses is indicated in Table 6.

Table 6

Participant Self-Assessment Regarding Whether Distracted When Using Learning Technologies (Gender Indicated) (Item 26)

School and Participants	Level of Agreement				
	Strongly Agree	**Somewhat agree**	**Neither agree nor disagree**	**Somewhat disagree**	**Strongly Disagree**
School A Year 10 (n=9)	0	3 (M)	1 (M)	5 (M)	0
School B Year 7 (n=14)	0	1 (M) 1 (F)	1 (M) 1 (F)	2 (M) 5 (F)	3 (F)
School B Year 10 (n=7)	1 (F)	1 (M) 1 (F)	2 (F)	2 (F)	0
TOTAL	1 (1 F)	7 (5 M, 2 F)	5 (2 M, 3 F)	14 (7 M, 7 F)	3 (3 F)

Collectively, eight of the students either *somewhat* or *strongly agreed* with this statement, 17 *somewhat* or *strongly disagreed*, and five students surveyed *neither agreed nor disagreed*. More than half of students indicated that they

disagreed with the statement. This data was triangulated with other data sets from the semi-structured interviews and classroom observations and will be explored in later chapters.

When separating the year levels of the students, and therefore separating by age, two of the Year 7 students agreed that they are distracted by technology. The remaining 12 were either *neutral* or *disagreed* with the statement. In contrast, six of the Year 10 students indicated that they find learning technologies distracting, and three students were non-committal.

Further to this, another potential point of interest is the difference between male and female students' perceptions of whether they are distracted by learning technologies (see Table 7). When the data relating to Item 26 is aggregated and presented as a percentage, there is a clear difference between how male students self-assess their level of distraction when using learning technologies (35.7%) as opposed to females (18.5%). This data, coupled with the data relating to differences by age, suggest that both maturation and gender could influence factors when considering whether language learning technologies promote learning or lead to distraction, and the willingness of students to acknowledge these things.

Table 7

Participant Self-Assessment Regarding Whether Distracted When Using Learning Technologies (Item 26)

STUDENT N & %	LEVEL OF AGREEMENT				
	Strongly Agree	**Somewhat Agree**	**Neither Agree nor Disagree**	**Somewhat Disagree**	**Strongly Disagree**
MALE (N=14)	0 (0%)	5 (35.7%)	2 (14.3%)	7 (50%)	0 (0%)
% TOTAL	35.7%		14.3%	50%	
FEMALE (N=16)	1 (6%)	2 (12.5%)	3 (18.7%)	7 (50%)	3(18.7%)
% TOTAL	18.5%		18.7%	62.5%	

Key Finding 4.3 – Maturation and gender could influence students' self-assessment regarding whether learning technologies promote language learning or lead to distraction.

4.2.3 Decision-Making when Using Learning Technologies

The extent of students' decision-making about utilising learning technologies for language learning was initially explored using questions about the frequency of self-testing, preference for traditional learning methods, and the varieties of self-sourced digital resources. Thirty students responded to this item, and 22 indicated that they frequently self-test their language skills using the testing features of web-based programs and applications. The frequency of this testing ranged from only *two to three times a term* to *more than once a week* (see Figure 4). Self-testing frequency was predominately linked to vocabulary revision and determining the content that required additional attention. One student indicated that their testing was to help

'cram' before assessment, and two recorded that their main reason for testing was to avoid teacher and parent judgement.

Figure 4

Frequency of Self-Testing (Students)
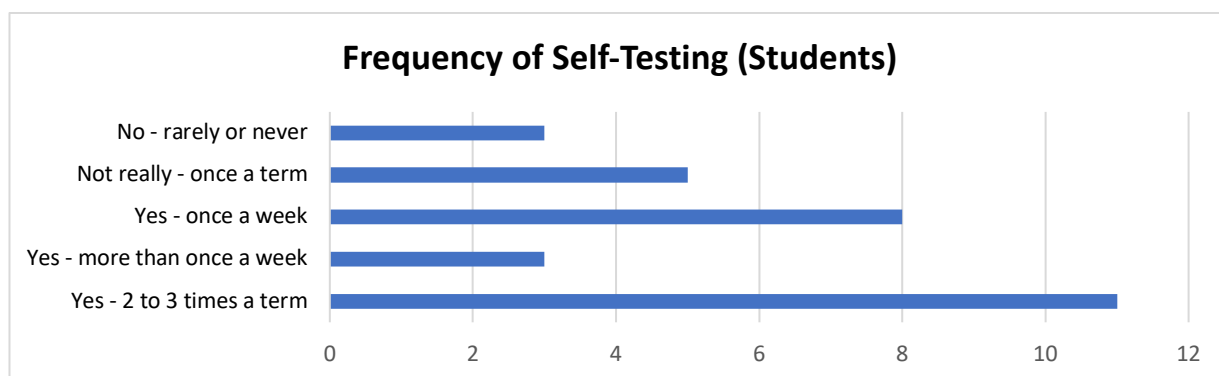
When asked whether more traditional methods (such as physical flashcards and hand-written notes) were preferable when learning languages (Item 28), students' responses indicated a preference for digital revision methods; however, traditional methods were also popular. These responses are represented in Table 8.

Table 8

Student Study Method Preferences (Item 28)

STUDY PREFERENCE	N (%)
PREFER DIGITAL STUDY METHODS	12 (40%)
PREFER TRADITIONAL STUDY METHODS	8 (27%)
NO PREFERENCE SPECIFIED	10 (33%)
TOTAL	30 (100%)

Twelve students preferred digital study methods over traditional ones, 10 did not indicate a preference for one learning strategy over another, and eight students stated that they preferred more traditional methods for learning languages. Of those who preferred traditional methods, half were students in Year 7 and half in Year 10, indicating that students in both age groups, and with varying levels of experience,

appreciate both digitally and non-digitally supported study methods for language learning.

When asked whether students use digital technologies to engage with additional language learning activities they source themselves (Item 19), responses ranged from *sometimes* (eight students), *often* (11 students)*, very often* (six students) or *constantly* (two students). The remaining three students indicated that they do *not* use digital technologies to source additional language activities. Twenty-two students of the 30 students indicated that they engaged in language learning games, learning programs, and websites. Video grammatical explanations and target language television shows and movies were popular with fourteen students. Two students indicated that they engaged with gaming in their target language, and a further two students wrote that they find opportunities to engage with discussion forums, web-based video, or social media interaction using their target language. For students who indicated that they did not use their digital technologies to engage in self-sourced activities, they specified that they watch Japanese anime or media, which, according to one respondent, "improves my listening ability" (Year 10, School A, Male, Student of Japanese). This data suggests that students are interested in and adept at sourcing various digital resources that either support or extend their learning or cater to interests related to the language studied.

Key Finding 4.4 - Students are interested in and adept at sourcing various digital resources that either support or extend their learning or cater to interests related to the language studied.

4.2.4 Quality and Quantity of Feedback Provided by Learning Technologies

To determine how valuable or useful students considered the feedback they received from digital mediums, they were asked to consider the online programs and applications they use and rate how helpful they perceived the feedback from these digital mediums to be (Item 35). All 30 students responded, and all five options were represented - *strongly agree* (10), *somewhat agree* (8), *neither agree nor disagree* (5), *somewhat disagree* (4), and *strongly disagree* (3).

Although deliberately unspecified in the question, the 'feedback' referred to could be feedback generated automatically from an online learning program or feedback provided by a teacher in a digital format. Eighteen students either *strongly* or *somewhat agreed* with the statement indicating that the feedback they receive in online learning programs or applications is helpful. Reasons for this included "they correct your answers" (Year 7, School B, Female, Student of French), "it helps me understand what I need to study" (Year 10, School A, Male, Student of Japanese) and "if you get a question wrong whilst using learning programs it shows you what you got wrong, and shows the right answer" (Year 10, School A, Male, Student of Japanese).

The five students who selected *neither agree nor disagree* when responding to Item 35 provided various reasons for their choice. One student indicated that while online learning programs provide the correct answers when something is incorrect, they "do not give any additional information on what skill set/s topics to work on" (Year 7, School B, Female, Student of Japanese). Another student said that "feedback given by online learning programs is usually very vague and unclear and is generally

not helpful as it usually just says if the answers are correct or not" (Year 7, School B, Female, Student of Italian). One student identified that for them, "teacher feedback is more helpful to me learning" (Year 7, School B, Female, Student of Japanese), and another two students were not sure that they had received feedback digitally, stating, "I'm not really sure if I have received feedback from online learning programs before" (Year 10, School B, Female, Student of French) and "idrk [I don't really know] cause I don't get feedback from websites about it" (Year 10, School A, Male, Student of Japanese).

Reasons for disagreement with the statement varied considerably for the seven students who selected either *somewhat disagree* or *strongly* disagree. Some students indicated that they do not use websites or programs that provide feedback. Others suggested that the feedback they receive only considers a few factors and is, therefore, unhelpful. Another student said that "it [online feedback] feels more like pandering than actually saying I'm getting better" (Year 10, School A, Gender not specified). Of note, four students referred to digital feedback provided by their teacher – not automatically generated feedback, but individualised feedback shared digitally with students on applications such as *OneNote* and *Showbie*. These students recognised that teachers could provide useful feedback online, and that "feedback given by online learning apps aren't always useful but can be as well. I think teacher feedback is more helpful to me learning" (Year 7, School B, Female, Student of Japanese).

Key Finding 4.5 – Most students find feedback generated by or
delivered via learning technologies to be helpful; for other

4.2.5 Influence of Learning Technologies Relative to Student Metacognitive Awareness

Students were asked to indicate their level of agreement with the statement, "using digital technologies for language learning helps me to understand how to learn languages as well as learning vocabulary and grammatical content" (Item 33). The intent of this item was to determine if students perceived a difference between learning and *reflecting* on *how* they learn (metacognitive strategies), and the cognitive strategies they use for studying content. The response rate for this question (Item 33) was 100%, and students selected one of *strongly agree* (5), *somewhat agree* (13), *neither agree nor disagree* (7), *somewhat disagree* (5), and *strongly disagree* (0). Results are represented in Table 9.

Table 9

Range of Agreement to Item 33 Statement – By Year Level and Gender

STUDENT RESPONSES (N=30)	YEAR LEVEL		RESPONSE TOTAL	RESPONSE TOTAL (%)
	Year 7	Year 10	Total n	Total %
STRONGLY AGREE	4F	1M	5	16.7%
SOMEWHAT AGREE	2M	5M	13	43.3%
	4 F	2F		
NEITHER AGREE NOR DISAGREE	2M	3M	7	23.3%
	2F			
SOMEWHAT DISAGREE	0	1M	5	16.7%
		4F		
STRONGLY DISAGREE	0	0	0	0%
TOTAL	14	16	30	100%

The words 'cognitive' and 'metacognitive' were not used in this question out of concern that they would confuse the students; however, the nature of the responses indicated that students still found this question difficult to understand. Despite the strong indication of agreement with the statement and all students responding to the item, when asked to explain and provide an example supporting their response, 28 students responded. Of these 28 responses, two students left the explanation question blank (both Year 10, School A, Male, Students of Japanese), one indicated that they were unable to explain why (Year 10, School A, Male, Student of Japanese), one indicated they were not sure (Year 7, School B, Female, Student of Spanish), and another stated that they didn't "really understand the question" (Year 7, School B, Female, Student of Japanese).

To analyse the written responses students provided in Item 34 (explanation of choice in Item 33), responses were classified as 'cognitive' or 'metacognitive' strategies, and grouped according to whether the responses focussed on *what* they did (cognitive) as opposed to *why they did it that way* (metacognitive). Except for the students who did not answer the explanation question at all or provided a "no" or "not sure" response, all students referred to cognitive strategies rather than metacognitive ones. Students' responses focussed significantly on the scope of resources available, digital content explanations, and the speed with which technology can aid learning but not on metacognitive strategies to assist learning. Five students indicated that digital technologies help them to learn "quicker and better" (Year 10, School A, Male, Student of Japanese), and another focussed on his ability to self-pace his learning (Year 7, School B, Male, Student of Japanese). Three students indicated that, to them, digital technologies do *not* assist them, citing that

"the easiest way to memorise a language is through pen and paper" (Year 10, School B, Male). A Year 7 student (School B, female) stated that "digital technology has helped me learn very minimal ways to understand how to learn languages, but it is very useful when learning vocabulary and grammatical content as there are apps such as Education Perfect that teaches grammar and quizzes students on it"). An older student in Year 10 recognised that access to digital technologies "provides me with new ways of doing so (learning languages)" but that they "do not think digital technologies helps me to understand how to learn language" (School B, female).

In the twenty-eight responses to Item 34, four students referenced practices that could be broadly related to metacognitive awareness of language learning processes due to their focus on why they employ a particular strategy. One student explained that they "use technologies to remind myself of vocabulary that I have forgotten" (Year 10, School A, Student of Japanese). Another two students, both in Year 7 French at School B (both Female), referred to the in-depth explanations and multiple contexts and scenarios that they can use to test their knowledge of the languages they study, and the fourth student referenced their use of videos to self-assess their progress in their language learning (Year 7, School B, Male, Student of Japanese).

There was a broader spectrum of agreement with the statement within the Year 10 group, indicating that their awareness of metacognitive strategies or understanding of metacognitive processes was more significant or sophisticated than that of the younger students. Despite this, many comments relating to metacognitive aspects of language learning came from Year 7 students, which may indicate that

greater pedagogical emphasis on metacognition and metacognitive strategies for learning are being explored with younger students, which also aligns with School B's publicised academic priorities.

Given the broad range of responses and the indication that the statement was not fully understood, the concept of metacognitive awareness was further explored in the semi-focussed interviews and remains an area worthy of further investigation in the field.

> *Key Finding 4.6 – Students found it difficult to distinguish between cognitive strategies for learning content, and metacognitive strategies, for evaluating the effectiveness of these strategies.*

4.3 Student Survey Responses – Summary

The student survey responses discussed in the previous section revealed findings that were further explored during the semi-structured interviews. Student survey responses indicated that learning technologies factor little in their engagement when learning additional languages, but they are significantly tethered to student perceptions of how they acquire knowledge. When access to learning technologies is disrupted or denied, students indicated that their confidence and organisation decrease, and, in many cases, frustration, anxiety, and vulnerability can increase.

Students were interested in sourcing various digital resources that could support or extend their learning in additional languages education. When digital resources provide automatically generated feedback, students found it helpful;

however, they placed greater value on the feedback provided to them by their teachers, whether digitally generated or not.

Students found it difficult to distinguish between cognitive strategies for learning and metacognitive strategies for assessing the effectiveness of these. While not evident statistically, results in the survey also suggested that students' gender and maturity could influence their self-assessment of whether learning technologies can be a distraction to them or promote language learning.

In the following section, the results of the teacher survey are presented.

4.4 Teacher Survey Responses – Overview

Across both School A and School B, ten teachers of additional languages agreed to participate in the data collection process (survey, observations, and semi-structured interviews). Table 10 presents teacher participants by school and language taught.

Table 10

Teacher Participants by School and Language Taught

SCHOOL	LANGUAGE TAUGHT					
	Chinese	**French**	**German**	**Italian**	**Japanese**	**Spanish**
SCHOOL A	0	0	0	0	5	0
SCHOOL B	0	2	0	1	1	1
TOTAL	0	2	0	1	6	1

Of these, five teachers were from School A, and five from School B, ranging in experience from five or fewer years of teaching to between 25 and 30 years of language teaching experience. Three of teacher respondents identified as male, and the remaining seven identified as female. All teachers strongly indicated that they enjoy teaching their languages and are confident in doing so. Six were Japanese

teachers, two were French teachers, one was an Italian teacher, and one was a teacher of Spanish. All teachers *strongly agreed* that they enjoyed teaching languages (Item 8), and cited reasons for this that included connections to personal and cultural heritage (1), having strength and passion for the language and seeing students becoming passionate speakers of the language (5), witnessing student discovery of languages and the relationships between them (2), or the characteristics that make languages different (2).

While pedagogical differences exist in terms of teaching students of character-based languages as opposed to languages using similar alphabets to English, it is unlikely that the language taught by the participating teachers influenced the ways that they approached the questions. In this study, the focus on learning technologies, autonomy, and metacognition transcended any differences between character and non-character-based languages, thereby enabling a single set of questions to be created and teacher responses to be treated as a single unit of analysis. While this current study focussed on student experiences prior to Year 12, approaches to additional language education in Years 11 and 12 are uniform in Queensland, so much so that the structure of the Queensland Curriculum and Assessment Authority (QCAA) senior syllabuses are identical. Within these syllabuses, differences only occur in prescribed grammar, character lists, and language or culturally specific references to the subject matter. In Years 11 and 12, all language assessment structures, conditions, and marking schemas are identical, irrespective of whether the language studied is character-based.

4.4.1 Perception of Learning Technologies and the (potential) Influence on Students' Learning and Agency

All teachers were asked to indicate their agreement with the statement "digital-technologies are very supportive resources (tools) when learning languages" (Item 25), and all teachers either *somewhat* or *strongly agreed*. Despite the agreement for this item, differences of opinion were evident when teachers were asked whether their students' academic performance and knowledge of additional languages was due to learning technology use (Item 18), as shown in Table 11.

Table 11

Teacher's Agreement with Whether Students' Academic Performance (grades) in Additional Languages is Largely Based on Learning Technology Use (Item 18)

TEACHER RESPONSE	SCHOOLS		TOTAL
	School A	School B	
STRONGLY AGREE	0	1	1
AGREE	3	1	4
NEUTRAL	1	2	3
DISAGREE	1	1	2
STRONGLY DISAGREE	0	0	0
TOTAL	5	5	10

For Item 18, which related to student academic performance, two teachers selected *disagree*, three selected *neutral*, and five selected either *agree* or *strongly agree.* When separating the data based on school, more teachers at School A agreed that academic performance was due to learning technology use. There are some unknown factors that could be influencing this data, such as the cohort composition of classes (e.g., single-sex as opposed to co-educational), the teaching practices

employed by the teachers to work with these cohorts, and the frequency with which learning technologies are used by teachers and students.

Disparities among the teacher respondents occurred again when asked whether students' knowledge of additional languages was largely based on learning technology use (see Table 12). Four of the 10 teachers indicated that their students learnt a lot of the time or constantly on their devices, and six of teachers indicated that students learning digitally occurred less frequently. Teacher responses were not aligned with the school at which they worked, nor did they reflect their years of experience or confidence in using learning technologies. Despite this, they may have reflected professional choice regarding how learning activities are prepared and delivered by the individual teacher and the personal learning preferences of the students.

Table 12

Teacher's Agreement with Whether Students' Knowledge of Additional Languages is Largely Based on Learning Technology Use (Item 17)

TEACHER RESPONSE	SCHOOL		TOTAL
	School A	School B	
VERY TRUE – THEY LEARN CONSTANTLY ON THEIR DEVICE	0	1	1
TRUE – THEY LEARN A LOT OF THE TIME ON THEIR DEVICE	2	1	3
NEUTRAL – THEY LEARN SOME OF THE TIME ON THEIR DEVICE	2	3	5
SOMEWHAT UNTRUE – THEY LEARN OCCASIONALLY ON THEIR DEVICE	1	0	1
UNTRUE – THEY LEARN RARELY ON THEIR DEVICE	0	0	0
TOTAL	5	5	10

To determine whether teachers believed that the potential of learning technologies to distract students could be a factor in their knowledge of and academic performance when learning languages, they were asked to indicate their agreement with the statement, "My students become very distracted when using technology for additional languages learning" (Item 26). Teachers' individual responses varied (see Table 13); however, most teachers *agreed* that their students were distracted. Again, this question was designed to obtain a general sense of teacher perception, which was further unpacked in the semi-structured interviews and observations to determine how and what distracts students when they use learning technologies. Similarly, such as in the data obtained for Items 17 and 18, many variables could have influenced this data, such as pedagogical strategy, student supervision, and learned behaviours.

Table 13

Teacher's Agreement with Whether Students Become Distracted by Learning Technologies When Studying Additional Languages (Item 26)

TEACHER RESPONSE	SCHOOL		TOTAL
	School A	School B	
AGREE	0	0	0
SOMEWHAT AGREE	2	4	6
NEITHER AGREE NOR DISAGREE	1	0	1
SOMEWHAT DISAGREE	2	1	3
DISAGREE	0	0	0
TOTAL	5	5	10

Key Finding 4.7 - Teachers agreed that learning technologies are supportive but distracting resources; however, opinions were

4.4.2 Learning Technologies' Influence on Pedagogical Practices

All ten teacher participants indicated that they source learning activities using digital technologies at least *sometimes* (20%), with 80% of respondents indicating that they do this *often* (50%) or *constantly* (30%). These resources included language learning games, websites, video and text-based explanations of grammatical patterns and cultural practices, music, and online dictionaries. The teacher of Italian (School B) explained that she did not use a textbook and so "all learning is found online or created by the teacher".

Ninety per cent of teachers indicated that they use testing features of web-based programs or applications to assess their students' language learning. Reasons for this included revising vocabulary, revising grammatical content before assessment, and assisting teachers in determining how much students know and, therefore, what content and concepts require further attention. One teacher (School B, a teacher of Italian) indicated that she tests students frequently on digital platforms. She explained that it was because "it helps both student and teacher to understand gaps in knowledge and progress and for me to teach what is missing, or for them to revise." This was the only response acknowledging student and teacher benefits rather than being student- or teacher-centric.

Given the inclusion of learning technologies in contemporary additional language classrooms, teachers were asked to comment on how they felt when access to technologies was denied – potentially due to connectivity issues or relocation to rooms without suitable equipment (Item 24). The ten teacher responses varied markedly, possibly reflecting the degree of use of learning technologies in their regular teaching practice. Two teachers from School A referenced the inconvenience when not able to access technologies due to the extent of physical and digital integration in contemporary classrooms. Despite this, one of the teachers acknowledged that "every year-level works on paper well, so there would still be a 'full' lesson taking place" (School A, teacher of Japanese). While experienced teachers indicated that their confidence remained unchanged when experiencing no access to technologies, there was evidence that both early career teachers and experienced teachers understood that using learning technologies is, as one experienced teacher of French in School B observed, "not the main intention of the lesson." Additionally, an early-career teacher of Spanish, also at School B, reflected that "the human connection and [the] communicative element of language acquisition is the most important part…technology is part of the toolkit, and while it can enhance the input of language and facilitate greater depth, it's only one component of this."

Key Finding 4.9 - Despite feelings of inconvenience and frustration when access to learning technologies is diminished, teachers of all experience levels are confident in their abilities to maintain continuity of learning with alternative pedagogical strategies.

4.4.3 Decision-Making when Using Learning Technologies to Teach Additional Languages

Nine of the ten teachers indicated they felt a strong sense of professional autonomy to utilise teaching and learning resources in ways that best suited their students' needs (Item 46). The remaining teacher *somewhat agreed* with the statement, indicating that professional autonomy in this space remains strong. Professional autonomy was explored further in the semi-structured interviews.

Enjoying a sense of professional autonomy to choose when to utilise learning technologies when teaching additional languages was also evident when surveying teachers about their preferences around digital and traditional teaching and learning methods. When asked to indicate whether they preferred more traditional methods such as pen and paper, using a black or whiteboard, or creating flashcards, 70% of teachers agreed (Item 28). Many of these teachers then commented on the need to include tactile learning experiences to cement content in their students' long-term memory and to prepare for handwritten assessments (Item 41). Japanese teachers' comments on the importance of handwriting were particularly strong due to the known link between handwritten notes, cognitive engagement, and content retention (Allen et al., 2020). Asking students to 'step away from screens' was also a theme in the responses of European language teachers, with one commenting on the

"enormous benefits of blended learning" (School B, a mid-career teacher of Italian), and the importance of the space provided to students when away from screens that provide "freedom of thought as well as help measure what students truly know" (School B, a mid-career teacher of Italian).

Providing a balance between traditional and digital teaching and learning methods was the focus of two teachers' responses to Item 41. One teacher highlighted the need to "give students a break from the screen" and that "they [students] do appreciate the time" spent learning in more traditional ways (School B, a mid-career teacher of French). Similarly, an early career teacher of Spanish (also from School B) wrote that, for him, "technology can be incorporated with well-established routines and expectations". This teacher is "consciously having conversations with them [students] now about notetaking strategies, and how I want their electronic notes sorted".

Key Finding 4.10 - Teachers felt a strong sense of professional autonomy to utilise learning technologies in their teaching. Many include a mixture of digital and non-digital activities to embed content and understanding in students' long-term memories.

4.4.4 Utility of Feedback Provided to Students via Learning Technologies

As learning technologies feature heavily in contemporary additional languages education, teachers were asked to indicate their agreement with the statement, "the feedback my students receive in online learning programs or applications is helpful

to their learning" (Item 35). There was 80% agreement with this statement (n=10) (see Figure 5).

Figure 5

Teacher Agreement with the Statement, "the feedback my students receive in online learning programs or applications is helpful to their learning" (Item 35)
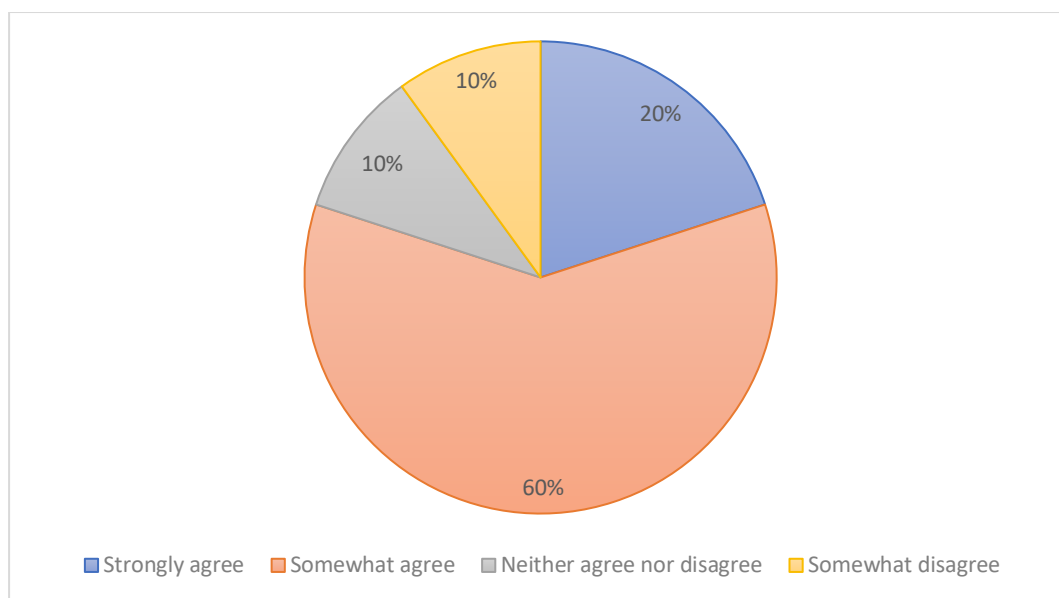
In the open-ended question that followed (Item 36), teachers were asked to explain their choice to the previous question (Item 35). The provision of instant feedback was a common theme in these teacher responses regarding why they agreed with the original statement. Despite this agreement, many teachers pointed out that the instant feedback provided "may only target one aspect of learning (i.e., character recognition*)" ...*and that "this may not entirely be a true reflection of their wholistic language skills" (School A, an experienced teacher of Japanese). One of the teachers *strongly agreed* that the feedback provided digitally was valuable and explained that this was due to her creating "the feedback my students receive via their online learning programs...each piece of feedback is important to their learning" (School B, a mid-career teacher of Italian). The nature of this teacher's created digital

feedback was discussed further with her during the semi-structured interviews, where it became clear that she not only uses applications that provide instant and continuous feedback but also carefully constructs individualised feedback for her students through non-automated applications. These applications require her to review fully formed pieces of student work, in response to which she creates either written or voice comments, and then this feedback is returned to her students via a digital application. Similar to the teacher of Italian, a French teacher at School B also acknowledged in her survey response the benefits that digitised feedback exchanges provide her and her students with when striving for a quick turnaround for senior assessment drafts as "due to the feedback being instant, as soon as it is entered into the app students are able to review their work and make changes".

Key finding 4.11 – Teachers believed that instant feedback provided to students automatically is helpful; however, often one-dimensional. Teacher technology use that generates timely, multifaceted, and individualised digital feedback is valued more highly.

4.4.5 Influence of Learning Technologies on Students' Metacognitive Awareness

Teachers were asked whether they agreed with the statement that "using learning technologies for language learning helps my students to understand how to learn languages" (Item 33). Their responses are represented in Figure 6. *Agree* or *strongly*

agree was selected by six of the teachers, and a further two chose *somewhat disagree*

and *neither agree nor disagree*.

Figure 6

*Representation of Teachers' Agreement to Statement "using learning technologies
for language learning helps my students to understand how to learn languages"
(Item 33)*
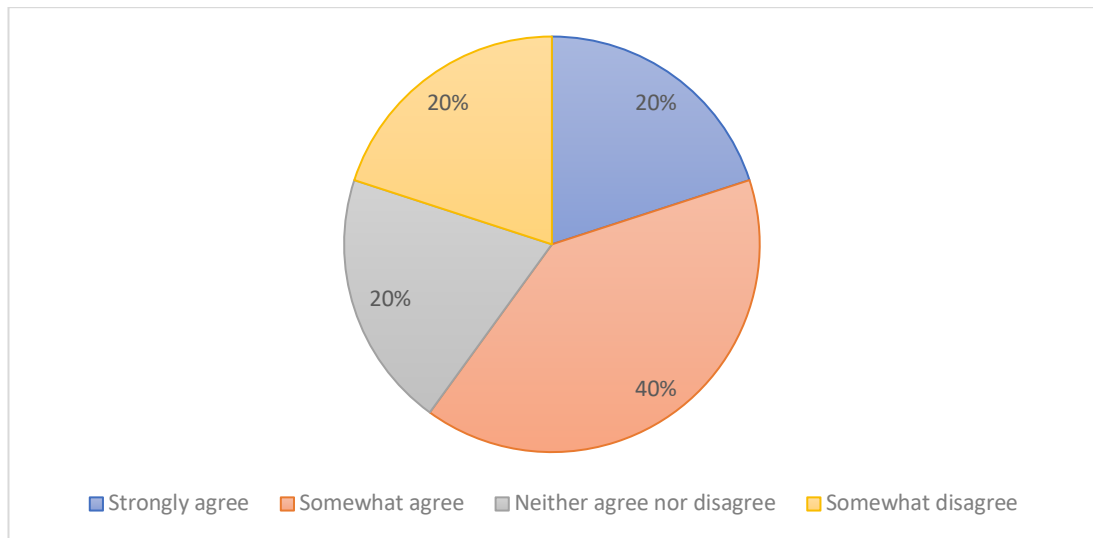
In contrast to the student survey group, for the qualitative question that

followed (Item 34), the teacher group were easily able to indicate that content

knowledge, cognitive strategies for learning knowledge, and honing metacognitive

strategies are distinct skills (Agarwal & Bain, 2019); however, many still struggled,

and 60% of qualitative responses to Item 34 focussed in some way on the content

taught. For the two teachers who *somewhat disagreed* with the statement, both from

School A (teachers of Japanese), their written comments included the need for

"mentorship and practice in an authentic classroom sense" and a view that the "tech

provides them [students] with further opportunities to engage in the language and

see it in action". The two teachers who *neither agreed nor disagreed* offered different

reasons for their selection. One indicated that maturity "to reflect on the processes

involved" (School B, a teacher of French) was necessary, and the other shared that for her, metacognitive awareness generated by learning technologies was dependent on "the knowledge type you are teaching", and that "receiving immediate feedback and/or assistance/clarification from a teacher is often better than just learning how something in the language functions from a digital method" (School A, a teacher of Japanese).

Reasons also varied for teachers who *agreed* or *strongly agreed* that learning technologies help students become more metacognitively aware. Two teachers from School B *strongly agreed* with the statement and, in their comments, linked their thinking to metacognitive awareness. The first, an experienced teacher of Italian from School B, explained that she "demonstrates the role each technology has in their [students'] learning, and they are able to see the advantages". The second, an early career Spanish teacher (School B), explained that he develops metacognitive awareness and strategies by using the learning technologies available to him to incorporate "metacognitive videos" into his lessons, to set "retrieval tables via *Notability* [in application] to continually retrieve information", and that he regularly asks his students to "record their spoken responses and reflect on strengths and weaknesses". The difference in these two responses, in comparison to those offered by other participants, was that the teachers identified their role in developing student metacognitive awareness and acknowledged that the learning technologies would not do this for them. In regard to this item, responses indicate that teachers also confuse the concepts of content development, cognitive strategies for learning, and metacognitive strategies and techniques for reflecting upon the learning. This suggests that further investigation in this space is warranted.

Key Finding 4.12 – Some teachers confused the ideas of content development, cognitive strategies for learning, and metacognitive strategies for reflecting upon learning, and the role of learning technologies in developing these distinct concepts.

4.5 Summary

Data revealed in the survey indicated that learning technologies occupy a large place in contemporary additional languages education and are appreciated and used by students and their teachers. Despite the perceived opportunities that learning technologies provide, they bring with them challenges in the forms of student dependence and distraction, and the need for teachers and students to carefully critique their use, ensuring that pedagogical, cognitive, and metacognitive approaches are not undermined due to the evolving sophistication of automaticity. The data also revealed that there is a gap in both student and teacher understanding and awareness of metacognitive strategies and how learning technologies support students in their development.

In the following chapters (Chapters 5 and 6), the data gathered during the observations and semi-structured interviews will be explored. In Chapter 7, these three sets will be discussed holistically to determine areas of strength and to identify opportunities for pedagogical interventions, further study, and investigations.

Chapter 5 – Observation Data

"Observation has the advantage of capturing data in more natural circumstances."

(Mulhall, 2002, p. 308)

5.1 Classroom observations – Overview

The second data collection process involved a series of classroom observations, focussed primarily on the learning technologies used by students and their teachers, and the behaviours exhibited by both groups. Information gathered in this phase related to the participants' interaction with learning technologies, the decision-making evident in the learning experiences, and whether there was evidence of metacognitive processes influenced by learning technologies and agency. The classroom observations aimed to match the observed behaviours of the participants with the responses they provided in the survey and semi-structured interviews. In other words, the observations were conducted to "check whether what people say they do is the same as what they actually do" (Mulhall, 2002, p. 307). The observations enabled classroom contexts to be captured and related to the participants' activities, seeing how students and their teachers interacted, and noting how the physical environment (both static and created by the teacher) influenced the behaviours of the participants (Mulhall, 2002).

In total, five teachers and twenty-one students were observed. Sixteen of these students were in Year 11 (Year 10 at the time of Phase 1), and the remaining two were in Year 8 (Year 7 at the time of Phase 1). Fourteen students from School A (Year 11) were observed during a single lesson, and seven were observed across six separate sessions at School B.

Several attempts were made to observe the participating students early in the year; however, COVID-19-related lockdowns significantly impacted Semester 1 classes, and it was only possible to visit School A in Semester 2. Teachers at both schools were generally reluctant to have visitors for fear of disrupting classroom work, exacerbated by shortened school terms. In addition, for most of 2022, COVID-19-related illness and, therefore, absences from school for students and teachers were significant. For these reasons, arranging suitable observation times was challenging, particularly early in the year. The observations, therefore, occurred in Semester 2 when classroom visits were once again welcomed by the schools, when students felt more comfortable, and when rates of illness had subsided. The timing of these observations was later than initially planned, and so the influence of the observation data on the semi-structured interview questions was less than expected during the planning phase of the project. During the analysis phase, however, the observation data confirmed findings developed during the survey and semi-structured interview data analysis. It is important to note, however, that while the researcher took all care to remain objective during the observation process with each group, the data collected and then later analysed reflects the researcher's interpretations of what was occurring in the classrooms at any given time (Mulhall, 2002).

Observations were arranged by appointment with the classroom teacher, dependent on whether the students to be observed were present. The researcher met with the students before the class started and explained that they were expected to participate as usual and that the researcher would sit nearby and take notes on learning behaviours and how they were or were not using their technologies. The

researcher sat behind or to the side of the students being observed so that they could accurately record the activities and program or device use.

A recording instrument was developed to structure the observations (see Observation Protocol Appendix 3). This enabled the researcher to quickly gather consistent information in each classroom, and separate information regarding the behaviours of the observed student or students and the teacher. It also allowed the researcher to record additional notes, questions, or observations outside the scope of the proforma.

5.2 Learning Technologies used by Teachers and Students

A range of learning technology devices and programs or applications were used in both schools. In all six classes observed, laptop computers were used by the teachers from the front of the rooms to project lesson content onto a standard whiteboard via a ceiling-mounted data projector. Despite being portable devices, once in use, the laptops were not moved from the front of the classroom, and there were no interactive whiteboards used. In School B, three teachers also used an iPad to generate lesson content, either saved and used later in the lesson or projected from the iPad as the teacher moved around the room, interacting with students, and checking their progress. All students observed used Apple iPads (School B) or Microsoft tablets (School A) during their language lessons.

Students and staff also used a wide variety of digital programs and applications. Programs used by staff and students in School A for teaching and learning activities were:

- Socrative (https://www.socrative.com/) – an interactive classroom application that enables learning activities and assessments that provide immediate feedback to teachers and students.

- **Jeopardylabs** (https://jeopardylabs.com) – a retrieval game website providing a shared platform for users that enables Jeopardy-style quizzes. These quizzes are either pre-made by other users and accessed by members of the public or can be custom-made to prompt revision and the application of target language knowledge.

- **Microsoft Word** (Microsoft® Word) – a digital word processor used by students to record digital notes. Microsoft Word is a part of the Microsoft 365 Suite.

- **VLC video player** (https://www.videol–n.org) - a free, open-source multimedia player that enables students to engage in most multimedia files.

- **YouTube** (www.youtube.com) – a global platform enabling the sharing of online videos. The teacher used YouTube to provide digital content in a retrieval game – in this case, it was used to share Japanese commercials.

- **Microsoft OneNote** – note-taking software designed to enable free-form note-taking, sharing resources and multi-user collaboration.

Similarly, staff and students at School B used various programs and applications; however, these were in more significant numbers. Those observed were:

- **QLearn** (https://qlearn.eq.edu.au) **(Canvas)** – a digital Learning Management System used by students and teachers. This platform allows teachers to prepare and then share content with students. Students from School B

referred to QLearn as Canvas, as it was known by that name during the trial period in 2022 when the data for this project was collected.

- o **Showbie** (https://www.showbie.com) – web and application-based program enabling students and teachers to share work and resources. Showbie also facilitates student discussion forums and has the functionality for teachers to provide digital feedback to students in written form or as voice notes.

- o **Notability** (https://notability.com) – an application for digital note-taking. Notability is a core application used in School B as a digital notebook. This application enables imported documents and texts so annotating can take place around the content. It also provides a camera option to take photos and edit or annotate them. In-built templates enable users to utilise grids (for Asian-character practice) or various note-taking styles and organise notes in folders.

- o **Padlet** (https://padlet.com) – a cloud-based application and website that enables real-time collaboration and organisation of content, shared as a digital 'bulletin board'.

- o **Microsoft PowerPoint** – a presentation program used to share content with students. Presentations are also saved as digital notes, enabling students to annotate them as they work through the lesson content during class.

- o **Online dictionaries** - various online dictionaries are used within School B. These include *WordReference* (https://www.wordreference.com), an online dictionary suitable for European languages. In School B, students and teachers were observed using *WordReference* in French, German, and Spanish lessons. Another online dictionary used by Japanese students and teachers was *Jisho*

(https://jisho.org). Using various search functions, this dictionary allows students and staff to quickly find words, kanji characters, and example sentences. The kanji search function was observed in School B when students searched for a character and then used the animated images to guide their stroke order. Teachers also used these animations when directly teaching students about the characteristics of Kanji characters.

- o **Education Perfect** (https://www.educationperfect.com) – a website and application teachers and students use to engage with curriculum content. Education Perfect automates learning pathways utilising the organisation's content and allows teachers to customise it. It uses data to determine individually for each student what content needs to be revised and how often. It also provides analytics for teachers to inform their curriculum planning. Using the 'spaced repetition' principle, Education Perfect is a preferred application by additional language teachers as it automatically mimics work that traditionally would have been done with flashcards.

- o **Chrome** and **Safari** – Internet browsers. Students in School B were asked several times during the observations to find suitable content for the learning activities they were engaging in. Most students used Chrome or Safari and worked within the parameters of appropriate content set by the school. Where a website's content was deemed questionable, the education department blocked the site.

Across both schools, a data projector was used to share content or activities with students. The Microsoft suite (OneNote, PowerPoint, Word) was also used at both

schools to share information or record notes and Internet browsers were used. *Education Perfect* was referenced at both schools, but its use was only observed at School B.

5.3 Pedagogical Practices of Teachers Incorporating Learning Technologies

In all lessons observed, there was evidence of well-entrenched classroom routines, although they varied greatly in style, demonstrating teacher autonomy regarding the learning activities and how they were implemented. There was also evidence that the supervision of these routines relaxed as the age of the students increased - Year 11 students received less explicit instructions around their learning technology use than those students in Year 8.

Teacher presence was a significant factor in keeping students on task and managing classroom behaviour. Where teachers chose to instruct from the front of the classroom (Year 11 French, School B and Year 11 Japanese, School A), there was more evidence of student distraction, with students engaging in digital activities outside the lesson's learning objectives. These activities included sending and checking emails, playing digital chess and billiards (Year 11 Japanese, School A), and remaining off-task while trying to fix a neighbour's technology issues (Year 11 French, School B). These classes also had a high level of digital interaction throughout the lessons, and while the activities changed, the students used their devices for most of the lesson.

There was no evidence of student distraction in classes with various manual and technology-based activities, and where teachers used their technology while also

moving around the classroom (Year 8 Japanese, Year 8 Spanish, Year 11 German, Year 11 Spanish, all School B). The students in these classes were also given explicit instructions from their teachers about what was and was not permissible at each juncture of the lesson. For the younger students in Year 8 Spanish (School B), the teacher taught new concepts from the front of the room using either a digital note or PowerPoint presentation projected onto the whiteboard or manually writing content on the whiteboard. When students were asked to choose an activity or if they were engaging in group work, the teacher circulated around the classroom with his iPad to monitor student work and behaviour and to assist them as needed. He also repeatedly provided students with clear instructions such as "close your iPads and put them in the corner of your desk like we've been practising" (Teacher of Year 8 Spanish).

Explicit instruction was also evident in Year 11 Spanish and German classes (School B); however, it was more casual, and the classroom activities had a more conversational feel. In these lessons, the teacher was situated in the middle of the room and could easily facilitate conversations. She took notes on her iPad, which were then projected in real-time to the whiteboard so the students could follow and engage in the discussion about the content. They were only permitted to use their devices after the discussion, and the students had all the information and instructions required to complete the activity.

5.4 Autonomy and Decision-Making in the Additional Languages Classroom

During the classroom visits, students and teachers were carefully observed for evidence of decision-making about how they used learning technologies. In all classes, there was evidence of teachers carefully structuring learning experiences involving manual and technology-based activities. There was no indication that teachers relied solely on technology or that their lesson content was driven by learning technologies. Rather, there was evidence that teachers were cognisant of the possibilities and limitations of technologies. They carefully structured their lessons around these, facilitating discussion and signposting key content points, and how they wanted their students to engage with them.

With regard to students making decisions about their use of learning technologies, there was evidence that students were making clear choices about their use of learning technologies, even when knowing their choices hampered accurate or timely language acquisition. Students were observed choosing their preferred method of recording classroom notes: writing digital notes with a stylus or

iPencil, typing (Year 8 Spanish, School B), or writing with a physical notebook and pencil or pen (Year 8 Japanese, School B).

Students were also observed making decisions about their engagement with the learning technologies. Specifically, a student in Year 8 Spanish was seen typing her responses. As she was typing Spanish words using the English keyboard, the spelling and grammar check underlined most of her words as they did not contain Spanish accents or follow English grammatical conventions. Rather than change the keyboard to Spanish, the student turned autocorrect off and commented that she did not want to download anything additional to make her typing in Spanish easier or more accurate. She did not know how to input Spanish punctuation and accents when typing but said she preferred to type rather than write using her iPencil, despite knowing she was not writing in Spanish accurately. Had the teacher been aware, this could have been an explicit teaching opportunity that assisted the student and allowed the teacher to monitor this behaviour across the rest of the class. It could also have facilitated further explicit instruction by asking all students to install a Spanish keyboard onto their devices or by asking them to handwrite their work to obtain practice relating to writing Spanish accurately.

While students demonstrated the ability to make decisions about their engagement with additional languages learning and how they participated in learning activities, they also showed that they could choose not to engage with work or allowed themselves to be distracted by trying to engage with the work while also conducting other, non-prescribed digital activities during lesson times such as gaming and emailing (School A) and stopping work to solve other's technology issues (School B).

Key Finding 5.2 - When observed, students made clear choices
about their use of learning technologies; however, it was unclear
whether or not their choices were informed by cognitive or
metacognitive strategies.

5.5 Evidence of Student Metacognitive Awareness of Language Learning Processes

In all six lessons observed, there was evidence that the teachers were aware of cognitive and metacognitive strategies and processes in learning sequences and activities. Classes generally started with a form of retrieval practice, such as the grid shown in Figure 7, requiring students to remember, revise, and use content learnt in previous lessons. Following this, new content was presented and worked with in different ways. There was also often a form of game or group work necessitating sharing this new knowledge with others.

Figure 7

Entry Retrieval Grid (School B Year 8 Spanish)
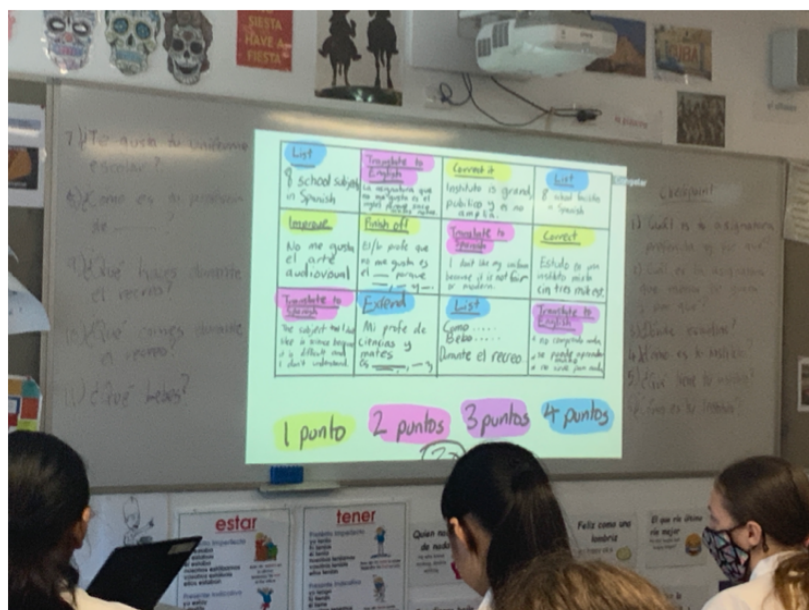
Despite this, the teachers did not, at any time, explicitly reference by name or explain these processes and strategies to students. Students were compliant and worked as directed, and when permitted by the teacher, they made individual choices regarding how they completed their tasks. The teaching staff never explained the rationale for why students were doing something in a certain way, so while compliant, students were not aware of what strategies they were choosing (cognitive strategies) or why reflecting on the efficacy of these was important (metacognitive strategies). This is a crucial area of pedagogical development that requires attention.

During the observations in both schools, students were passively engaged in cognitive and metacognitive processes, and there was no indication that students were aware they had employed a strategy for metacognitive reasons or that the activities they were participating in could be categorised as such. For example, when the student in Year 8 Spanish (School B) was observed typing Spanish words and phrases using English keyboard input and was asked about why she had chosen to do so, she explained that she was deliberately typing inaccurate Spanish using an English keyboard because the input was easier and not for any other reason (such as using the autocorrect function to identify errors in her language, or because her Spanish input function was not functional). When the student in Year 8 Japanese (School B) was asked why she chose to keep notes in both digital and hardcopy forms, she explained that it was to help her find her work, not because one method was proven to be more effective for retaining knowledge, or because she preferred one over the other. Students generally did not indicate in the observations that they chose to handwrite (even if digitally) because it was better for stroke development (Japanese) and accent accuracy (Spanish and French), or for the retention of vocabulary and

grammatical structures. For these reasons, the explanation of clear, direct, and explicit cognitive and metacognitive strategies needs to occur in relation to content and processes in the classroom.

Key Finding 5.3 – Despite evidence of embedded metacognitive strategy use in lessons, these strategies were often not made explicit to students.

5.6 Summary

The observation data collected during this study occurred after the initial survey and, in the case of School A, was the final data collected due to COVID-19-related accessibility issues. This critical data enabled the researcher to witness students and their teachers working and interacting with each other and with learning technologies, and supported findings in the survey and semi-structured interviews. The observation data confirmed that, while cognitive and metacognitive strategies were present and at work in the classrooms of the two schools, students often completed their work without being cognisant of what strategies they were using or selecting for self-directed work and how and why these strategies impacted their learning. The observation data also confirmed that distraction due to learning technologies is a potential issue for students and their teachers and that, where possible, utilising learning technologies in ways that enable easy movement around the classroom, particularly that of the teacher, is preferable to teaching from a static location within a classroom.

Chapter 6: Semi-Structured Interviews

"Qualitative interviewing begins with the assumption that the perspective of others is meaningful, knowable and able to be made explicit."

(Patton, 2002, p. 341)

6.1 Semi-Structured Interviews - Overview

Semi-structured interviews were conducted over approximately twelve months and were the third and final phase in the data collection process. The purpose of the interviews in the mixed-method approach was to understand the lived experiences of the participants, and what their experiences mean to them (Patton, 2002; Seidman, 2019). The extended data collection period was primarily due to COVID-19-related interruptions and the subsequent need to work through an additional ethics application to work with a Queensland government school (School B).

Semi-structured interviews were initially conducted with staff and students at School A. Due to restrictions around being physically on campus at this time, these interviews were conducted using WebEx, recorded, and transcribed using Otter AI. Otter AI uses artificial intelligence to transcribe meeting notes (combining audio and speaker identification), and provides the option to listen to the interview and correct the transcript where necessary to ensure accuracy. The semi-structured interviews at School B were undertaken face-to-face, and the audio was recorded using an iPhone and then transcribed using the process described above. All audio files and transcripts were uploaded to a secure folder on the Curtin University Research drive

in accordance with the approved data management plan. The audio files uploaded to Otter AI were deleted, and audio files were deleted from WebEx and the iPhone.

Nine students and five teachers were interviewed from School A, and seven students and nine teachers were interviewed from School B. Students and teachers were asked 13 questions developed from the responses in the Phase 1 survey (see Appendices 4 and 5). As several interviewees could not recall how they responded to the survey due to the delay between Phase 1 (survey) and Phase 3 (interviews), preceding the interviews, the researcher provided a brief summary of the responses gathered in the Phase 1 survey and asked participants why they believed the participants responded in such a way.

6.2 Student Interview Responses

Semi-structured interviews occurred with students either as a large group via WebEx (School A) or in smaller groups during the lunch hour (School B). The sizing and composition of the groups being interviewed were at the school's discretion, and all decisions around these groupings depended upon access to students and school schedules. All students were interviewed while they were in a classroom, and they were invited to bring their lunches with them (School B), or in the case of School A, the teachers provided the participants with some pizza and a drink to enjoy while they participated in the conversation. Due to the small size of the groups interviewed, the student responses from both schools have been grouped and considered as a whole, drawing on differences between age, genders, and languages where relevant.

The first interview question asked students about the degree to which they enjoyed learning additional languages. Six students responded to the question. They indicated that they enjoyed learning languages and linked this to a better understanding of cultural diversity, the potential for travel, target-language communication, and exploring the relationships between languages. One student said he found "learning languages a bit of a mix because…it's so easy to mess something up" (Year 11 French Student A, Male, School B), and focussed his response on how difficult he found maintaining the accuracy of his language use.

6.2.1 Students' Perceptions of Learning Technologies and the Potential Influence on their Learning, Agency, and Engagement

Students were asked why they believed there had been a range of responses to the statement, "My academic performance in learning languages is because I use digital technologies" (Question 2). Eight students responded to this question, and their answers reflected the importance respondents attached to learning technologies in revision and extension activities. All eight students indicated that they used learning technologies in their revision or extension activities when studying because they helped with practising their target languages. One Year 11 Spanish student said, for example, "that's the thing with languages, you just have to practise" (Student A, Female, School B).

Digital platforms enable students to access aspects of language that previously were limited to occasions in the classroom or when in the company of fluent speakers. For example, digital platforms enable students to hear speech (vocabulary lists, videos, or textbook audio tracks) and, therefore, allow students to

experience interaction with the target language outside mainstream classrooms. For example, Student B remarked that digital platforms enable one to "go ahead and do it [practise the target language]" (Year 11 French, Female, School B). Further highlighting how students value and use digital platforms to assist in their learning, one student remarked that it is entirely up to the student, and another, "if you're practising, I think using technologies is a lot easier" than practising in the classroom (Year 8 Japanese Student B, Female, School B).

Despite recognising learning technologies as essential for revision and extension, a quarter of all the responding students to Question 2 observed that the face-to-face or classroom experience was necessary for their learning. Two students explicitly identified face-to-face as a 'better' or 'easier' way to learn additional languages. Both these students were in their lower secondary school years (Year 8 at the time of interviews), and were less experienced with other cognitive strategies for learning. One student felt that, when practising speaking, it was "definitely better to learn one-on-one" due to the nuanced and "more accurate" feedback the teacher could provide, in contrast to the narrow and inflexible feedback generated by digital programs (Year 8 German Student A, Female, School B).

Key Finding 6.1 –Students valued learning technology-based activities as useful for revision or extension, and face-to-face learning was their preference when learning new or more challenging work.

Access to and use of learning technologies also greatly influenced students' desire to continue learning additional languages. When asked why respondents

indicated that the use of learning technologies made them want to continue their studies of languages (Question 4), nine students responded. Two respondents highlighted the role learning technologies play in facilitating real-world connectivity as a reason for influencing a desire to continue studying languages. One student stated that access to online content allowed her to visualise "how I can use this" (Year 11 Spanish Student C, Female, School B). The other commented, "after like, you know, only looking at textbooks and being like, 'Good day, how are you?' and then actually listening to what German sounded like when people my age were speaking, it was really like, 'Oh this is so cool!'" (Year 11 German Student A, Female, School B).

When responding to Question 4, students also observed that using learning technologies for additional language learning enabled them to self-pace and complement their learning with digital resources such as online dictionaries. However, one student remarked that self-paced, automated work brings with it a chance that the programs are "not really pushing you to keep learning, so that could be a loss of like, motivation or burnout" (Year 8 Japanese Student A, Female, School B). Another student referenced the ease with which she could complement her learning using *Duolingo* but noted, for her, "online learning isn't as good as in person" because "teacher encouragement, or peer encouragement…(are) more encouraging than like a little emoticon guy" (Year 8 German Student A, Female, School B). The same student also commented, "it's harder to say 'no' to someone in person than it is online…it's not a pressure thing…it's more like, you sort of like actually have (having) the emotional side".

6.2.2 Student Interaction with Learning Technologies and Influence on Learning and Achievement

When asked whether their knowledge of additional languages was due to digital technologies (Question 3), all eight students responded that access to and use of learning technologies has contributed to their performance. This was mainly due to the variety of resources at the students' disposal, which often enables them to experience practical aspects of the language that they otherwise would not easily access. Examples of these are "Duolingo…online classes" (Year 11 Spanish Student A, Female, School B), "listening to German music, watching German TV shows" (Year 11 German Student A, Female, School B), "Quizlet…and OneNote" (Year 11 Japanese Student C, Male, School A). Two students specifically referenced the geographical convenience and all-hours access provided by learning technologies, and the fact that "with, like those, like learning platforms, you can sort of try any language as much as you want and do it as often as you can" (Year 8 German Student A, Female, School B). Two students referenced convenience specifically and all eight students who responded to this question implied that convenience and access to materials in the target languages were vital contributors to their knowledge of additional languages.

Students responded differently when asked whether learning technologies were supportive resources (Question 5). Of the ten students who answered this question, four indicated that they felt entirely supported by learning technologies as "there's just so many different ways that you can learn…with language, you can really see how it's used using technologies, and that's very helpful" (Year 11 Spanish Student B, Female, School B). In contrast, one student indicated that although learning technologies were generally helpful, specifically when used as a reference

tool, they were "unsupportive when it's not helping me learn, or you know how technologies are (and) there's some glitch, then I can't do the lesson material" (Year 11 Spanish Student A, Female, School B).

For the same question (Question 5), two students indicated that learning technologies were more confusing than supportive due to conflicting information they encountered when engaging with them. A Year 11 student of German (Student A, Female, School B) explained that she feels confused "when, like, I have a question about grammar or something, and I look it up online and have…different answers or maybe answers that like are extended beyond…what my scope of understanding would be". Another student identified that the feedback received through digital learning platforms was sometimes inaccurate, and "if you get a question a little bit wrong, they'll tell you it's completely wrong" (Year 8 Japanese Student B, Female, School B).

Of note in the students' responses to this question (Question 5) was the number of responses that referenced the importance of the teacher's role and how they look to their teachers for reassurance when engaging with digital resources. Half of the students referenced the teacher directly or indirectly in their responses. These students, although utilising digital resources, were still looking for the expertise of their teacher, who understands the specific content being targeted, class composition, and skill level. One student stated, "if we were purely relying on technology to learn a language, there are some aspects, especially pronunciation, that wouldn't be…the same…as if we were being taught in person" (Year 11 Japanese Student C, Male, School A). Another said, "the teacher encouragement and peer

encouragement…there's like lots of people going 'oh yeah, that's good…I've tried this and do this' and um, it's more reassuring than a little emoticon" (Year 8 German Student A, Female, School A). Four of the ten students referenced the need for face-to-face instruction with their teacher and digital support when learning languages. One student identified that "being able to have both…that good tool of technology while also having the real interaction to help" was essential to his study of Japanese (Year 11 Japanese Student C, Male, School A).

Key Finding 6.2 - Although utilising digital resources, students were still looking for the expertise of their teacher to nuance the learning material for them.

Students were asked why they believed learning technologies distracted some students and not others, and they provided a range of responses (Question 6). Nine students responded to this question, and all acknowledged the ease with which learning technologies could distract them; however, they offered different reasons for this. One student observed that "especially with languages…there's so many things that interest people…so it's very easy to…fall down a rabbit hole when you're Googling certain things" (Year 11 German Student A, Female, School B). Another two students indicated that a student's level of distraction was related to their attention span and ability to focus, and another suggested that distraction is linked to how conditioned you are to a particular way of learning (Year 11 Spanish Student A, Female, School B).

All nine students indicated in their responses that learning technologies increase the chance that they will become distracted at some stage, whether at home or school. One student commented, "learning technology is helpful as a learning tool, but it doesn't really help in…saying you need to learn this or keep your focus on this" (Year 11 Japanese Student C, Male, School A). He continued by saying that "it's so easy to go from one tab to another and quickly, that it really doesn't help keep you focussed on one mindset or one goal in learning…you may have like, (an) online dictionary and then you may go over to a game, you may have your OneNote or your folder or books, and you can just quickly go into a different chat…something completely different than what you actually want to study." This sentiment was echoed by four other students, who indicated the cause of their distraction when using learning technologies is usually some form of movement between activities, boredom due to the repetitive nature of some digital activities or becoming fixated on something unrelated to what the class is working on.

For the same question, strategies discussed by students to manage their distraction also varied, with one student explaining that, for her, she employs "a school focus (setting on her iPad) … so I only get notifications from my parents if I need them" (Year 8 German Student A, Female, School B). Two students referenced the importance of explicit teacher instructions and supervision to remain focussed in class as "when they've got open access to…the Internet, they can do pretty much whatever they want" (Year 11 Japanese Student F, Male, School A) and "if it's…independent research time I kind of go off track…because I can" (Year 11 Spanish Student C, Female, School B).

Key Finding 6.3- Students acknowledged that learning technologies are distracting or have the potential to distract, and that teacher instruction and supervision are essential for minimising distraction.

6.2.3 Student Decision-Making when Using Learning Technologies

Teachers observed that even when students have access to learning technologies and a choice about how they engage with additional language learning, some choose to utilise 'traditional' learning methods. Examples of these methods involve the creation of physical flashcards of vocabulary or written characters, making posters containing content for display around the home or in a bedroom, keeping content-related questions in a book for later revision, and summarising or practising content in a physical book.

Students were asked whether they use these methods and, if not, why they think some students would prefer these approaches over digital ones (Question 7). Thirteen students responded to this question. There was a variety of responses, with one student explaining that she believes students like content "being set out a certain way so (that) when they go back to study in their books, they've got everything they need" (Year 11 Spanish Student A, Female, School B). Another indicated that "when I'm doing, like, drafting for like my assignments, normally I go a bit like, creative with the grammar…I take risks, but I feel like…when you have…those textbooks and things,

you always know that you can come back to…root sentences that will always be correct" (Year 11 German Student A, Female, School B).

A strong theme in student responses to Question 7 was the impact of the cognitive strategy of handwriting notes, and the link that this action can have regarding embedding content in one's memory. Of the thirteen students who responded to this question, six referred to either taking pen to paper or using a stylus and device to assist them in memorising content. Four mentioned the Apple pencil or a stylus for annotating digital resources or creating a digital notebook; however, one student stated that she "almost never use(s) my Apple pencil for writing…I have abysmal handwriting in a book on a good day, and so I can't write with an Apple pencil…because there's less friction (between the pencil and screen)… I just find that I type so much faster than I write…and if I'm going to write, it should be in my book, and not on a screen" (Year 11 Spanish Student C, Female, School B).

Despite many students choosing to write with a stylus, many preferred having physical resources on hand rather than managing several digital files or programs. A Year 11 student at School A (Japanese Student G, Male) explained, "Quizlet and Gimkit and stuff don't really work for me…so I prefer…writing out phrases or sentences that we've learned over and over…I find that easier to remember, like cards and stuff and…memorising which ones go with which." Another liked the visual nature of collecting content in a book as "it's quite visual as well…and you can sort of like keep it as…a physical source rather than having to go through all these files…I find that when I am writing (in a book), I memorise things a lot easier rather than (by) clicking a button" (Year 8 German Student A, Female, School B).

Three of the thirteen respondents to this question indicated that they use 'traditional' methods to study, mainly to mimic assessment conditions. They indicated that "because the tests are mainly conducted in the sort of traditional sense…you want to do it on a piece of paper because that's what you're practising…you're not going to have, like, autocorrect when you're in the exam…you can't really mimic that (assessment conditions) with technology" (Year 11 French Student B, Female, School B) and "it's kind of like, muscle memory" (Year 11 Japanese Student C, Male, School A). These comments were agreed to by other students in the semi-structured interview groups, with a further student adding, "technology can help us to practise like reading and writing and stuff, but like a teacher can help us with pronouncing words (in preparation for a speaking assessment)…you can't have a conversation with an iPad" (Year 8 Japanese Student B, Female, School B).

Personal choice and mixing and matching study techniques to one's learning preferences was also a strong theme in student responses to Question 7. Using an Apple pencil or stylus for writing activities is one example of how students made study choices that suited their personal learning preferences. One student indicated that she preferred "writing it down…I think it's much more easy to get that into your head in terms of, like, your paper to brain" (Year 11 German Student A, School B). Another stated that "studying languages by writing instead of by typing just becomes easier because you learn faster, and you learn better as well…that's one of the larger reasons that I find for using traditional means" (Year 11 French Student A, Male, School B). Mixing methods was evident also, with one student in Year 8 Japanese identifying that she would "rather learn the content on paper and then memorise it

online" (Student A, Female, School B) and another stating that "I think having both options is a good mix" (Year 8 German Student A, Female, School B).

Key Finding 6.4 – Some students choose to write in books and with a pen or stylus because this action mimics assessment conditions and assists with content retention.

6.2.4 Student Perspectives on the Quality and Quantity of Feedback Provided by Learning Technologies

When students were asked to speak to the quality of feedback in online learning programs and whether it was helpful (Question 12), students described the quality of feedback from automated, digital, language-learning programs as "a bit confronting, or it's a bit abstract" (Year 11 Spanish Student A, Female, School B), "straightforward" (Year 11 German Student A, Female, School B), "stiff" (Year 8 Japanese Student A, Female, School B), "lacks character" and is "repetitive and boring" (Year 8 German Student A, Female, School B). Seven of the sixteen students answered the initial question, and four more contributed to the discussion about what 'helpful feedback' looks like.

In their responses to Question 12, most students indicated that automated feedback is superficial and, as Student A remarked, "doesn't really tell you anything about your actual ability" (Year 11 German, Female, School A). Students indicated that, with automated programs, "you've just got a test result that you're not really sure what to do with because you don't know what points specifically were an issue" (Year 11 Spanish Student A, Female, School B). It was the "yes or no" or "stiff"

(referring to the rigidity of acceptable responses) (Year 8 Japanese Student A, Female, School B) form of feedback that appeared to be the basis of the criticism of this form of language learning for students.

The role of the teacher in providing 'helpful' feedback came through strongly in the interviews. Of the seven students who answered Question 12, only three referenced the importance or relevance of their teachers in the feedback processes; however, when the conversation shifted to what 'helpful' feedback looks like (Question 13), the teacher's role and the ability of classroom teachers to nuance feedback or provide learning opportunities outside the scope of learning technologies was mentioned by an additional four students. A Year 11 student of Japanese indicated that "in-class teacher feedback is a lot more personalised, and the teacher knows the student a bit more" (Student F, Male, School A). The ability to personalise feedback was also referenced by another student, saying that digital feedback "doesn't give you a bunch of different options that maybe a teacher that's got experience (can)" (Year 11 Japanese Student C, Male, School A).

Key Finding 6.5 - Students found that online feedback could be confronting, abstract and one-dimensional, preferring meaningful and personalised feedback from their teachers (digitally or in person).

6.2.5 Influence of Learning Technologies Relative to Student Metacognitive Awareness of Language Learning Processes

During the semi-structured interviews, students were asked whether they believed learning technologies helped them to understand *how* they learn languages (Question 10). Most students referenced their learning or practising of content (cognitive skills), rather than the skills related to how they reflect upon and direct their learning of content (metacognitive skills), indicating that they either did not know what skills they utilise for learning languages or could not see the role that learning technologies played in the development of their metacognitive strategies and awareness. Some students referenced how they or their peers interacted with learning technologies to affirm their 'learning style.' For example, Student F said, "technology allows them to um, you know, actually get to know themselves better as a learner, and that (will) probably help them" (Year 11 Japanese Student F, Male, School A). Others suggested that technologies acted as a way to "reaffirm(ed) things that I've already heard if that makes sense" (Year 11 German Student A, Female, School B).

Two students identified that they require their teacher's help to assist them with developing strategies for learning languages. One student shared that, to her, "I feel like it's learning those procedures in class and then applying them to the technology because technology is a great way to learn things, but it doesn't really teach you how to learn" (Year 11 Spanish Student B, Female, School B). This idea was reinforced by a Year 8 student of German who explained, "if I was just starting out…having a like…face-to-face lesson would have been much more beneficial…as a beginner, like face-to-face, it'd be a lot better in the ways of like how we learn"

(Student A, Female, School B). The same student commented that learning technologies are most helpful to her "as a side thing, not the main thing," as they are "quite helpful to practise...probably not for learning new content, just rehearsing it".

Students were further perplexed by the question that asked them to consider whether there was a difference between knowing *what* to improve as opposed to knowing *how* to improve (Question 11). All seven students grappled with this question, struggling to differentiate between learning and practising content, cognitive skills for learning content, developing metacognitive skills for reflecting upon the success of these, and adjusting accordingly. Six of the seven students who responded to this question were from School B, where a wide range of learning technologies are used to support additional language learning; however, this did not impact their understanding of metacognition, with one student likening the 'how' to the skills of "listening, reading, writing, speaking" (Year 11 French Student A, Male, School B), and another asking whether the interviewer meant "like when we're doing all the PACT (purpose, audience, context and tone)...stuff?" (Year 11 Spanish Student C, Female, School B). Another student guessed that "it's probably more like...what to improve...is kind of like looking at like, okay, whereas, like looking at my grades, where am I like, weaknesses (and) what do I do (now)?" (Year 11 French Student B, Female, School B).

One student's response initially indicated that she did understand the difference between cognitive and metacognitive strategies by saying that it is "easy to know what you need to improve on, but what steps need to be taken are a lot more difficult...it's hard to figure out exactly what you need to do...exactly what kind

of work, you know" (Year 11 Spanish Student A, Female, School B). However, she used *Education Perfect* as an example but focussed on how it "just lays it all out…this is what you're good at…this is what you need to work on." When asked whether the learning technologies she was referring to were predominately vocabulary-based, she responded, "probably vocabulary-based…but the rest of the time, it's a bit difficult to know what exactly you need to work on". She indicated that "you'd have to do a fair amount" to determine the best way to improve learning skills and that it was likely that several programs would be needed to achieve this, again focussing predominately on the statistical feedback provided by automated learning programs rather than the cognitive and metacognitive skills necessary for such a task.

One student from School A who responded to this question immediately acknowledged that "I'm not sure if I've interpreted the question" (Year 11 Japanese Student A, Male). He then referenced the program Quizlet and how "you can definitely see how much you've progressed…you literally see a progress bar there saying what you know (and) what you don't…it's very helpful for where to go." When prompted, he acknowledged that there was a difference between knowing what to improve as opposed to knowing how to improve, "but in terms of how you improve…it doesn't say necessarily what to do."

Key Finding 6.6 - Students demonstrated that they struggled to distinguish and articulate the difference between content, cognitive strategies for learning content, and metacognitive strategies for monitoring and purposefully directing their learning.

6.3 Teacher Interview Responses

Eleven teachers participated in the semi-structured interviews across the two schools – four from School A and seven from School B. The experience levels of these teachers ranged from early career teachers to teachers with more than twenty years of classroom teaching experience. Interviews occurred after the school day, via WebEx (for School A) or in a small meeting room (School B), with some afternoon tea. Not all teachers responded to each question. The number of teacher responses is indicated throughout the following text.

In the Phase 1 survey, all teacher respondents indicated that they enjoyed teaching. When asked in the interviews, all nine teachers who responded to Question 1 about these survey responses elaborated on why this was the case. There was a strong thread in teachers' responses regarding the importance of the link between language and culture and how one's culture, and therefore language, describes the world as they see it. One teacher said, for example, "there is no language without culture, and there's no culture without language" (French and German Teacher A, Female, School B). Another said moving across cultures and enabling students to "see themselves within what we are doing…moving from the familiar or unfamiliar" (Spanish Teacher A, Male, School B) was a significant reason teachers provided to explain their enjoyment of teaching additional languages to high school students.

6.3.1 Perception of Learning Technologies and the (potential) Influence on Student Learning, Agency, and Engagement

Teachers were asked whether they believed students' academic performance was related to their use of learning technologies (Question 2), and various viewpoints were expressed in the ten responses to the question. There was also a distinction between the responses belonging to teachers at School A and at School B. The three teachers at School A were more optimistic about the link between learning technologies and student academic performance, referencing the convenience and efficiency of digital programs and devices; however, despite acknowledging the positive implications of including learning technologies in their practice, the seven teachers at School B were more critical about the drawbacks of learning technologies and the influences these have on their students' learning, agency, and engagement.

Teachers from School A, where learning technologies are used regularly but are less embedded across the different curriculum areas of the school, indicated that learning technologies are likely to have a more significant impact on academic success for the younger students "when it's really simple language" (Japanese Teacher D, Female, School A), and that "it's probably easier for all the kids to like, revise…to look back at what they need…from the class…to go and have a look…catch up" (Japanese Teacher C, Female, School A). The teachers acknowledged that "for the older boys, you know…it's not necessarily going to…as heavily influence the outcome, I don't think" (Japanese Teacher B, Male, School A).

One of the Japanese teachers at School A identified that, for him, "the ease of the transparency of everyone doing the same thing (across the school) …helps us a little bit" (Teacher A, Male, School A). In contrast, two teachers of Italian at School

B indicated that "students don't have responsible use anymore…" (Italian Teacher A, Female, School B), "they're learning, but it's gotten to a point now, I think, where it's actually hindering…students…(they) just need to do everything through technology" (Italian Teacher B, Female, School B).

Reasons for 'hindered use' of learning technologies included passive engagement with technology where students "just stare at it [their iPad], not speak to each other, not ask a question…it's cognitive overload for them" as well as being distracted by their learning technologies "and get(ting) them to look at my screen and not their own" (Italian Teacher A, Female, School B). A third teacher at School B, again an experienced Japanese teacher, also referred to difficulties keeping students focussed on the task at hand, identifying learning technologies as "a distractor…kids will just keep on…resorting to playing games or doing something else" (Teacher F, Female).

Not all teachers at School B focussed exclusively on the challenges posed by learning technologies but instead identified conveniences provided by access to devices and programs. "Sometimes I think, oh my God, you guys are so lucky," an experienced Japanese teacher said, "if their curiosity is sparked by something, they can jump on the Internet and Google or whatever…it just gives them so many more avenues…whether it be they want extension…they need to catch up…need revision" or "just have curiosity about something" (Japanese Teacher F, Female, School B). This was reinforced by one of the early-career Chinese teachers, who identified that, to her, "just having technology…does affect students' academic results because information now is so much easier for us to pass through to them…in terms of

researching and…gathering ideas, it's so…convenient for them" (Chinese Teacher A, Female, School B). However, she acknowledged that as a teacher of an Asian, scripted language, "I believe technology has caused them to not be able to write as well".

Two teachers at School B, both creative users of learning technologies, identified the importance of the human connection despite learning technologies having a significant presence in their classrooms. One, an early-career teacher of Spanish, acknowledged that digital technologies, and the way that students interact with them, are one component of students being successful language learners, but that "what's even more powerful is sort of the human connection between, you know, making little corrections in class…presenting the sentence to them or giving them something a bit extra…I think that's more powerful to them than going home and doing two hours of EP (Education Perfect) or something like that" (Spanish Teacher A, Male, School B). Another staff member, an experienced teacher of Japanese, added that "we can't undervalue the human element", and referred to the way that learning technologies "sits behind" the human connection and assists teachers in supporting their students by "being able to contact (them) quickly and get feedback quickly, and get voice [recorded] feedback" (Japanese Teacher F, Female, School A).

All teachers indicated that they believed students' knowledge of additional languages was largely due to their interaction with learning technologies (Question 3). Despite this, their explanations as to why this was the case varied. Accessibility and exposure to online information and activities were strong themes, with four teachers indicating that online content "is more accessible nowadays" (Japanese Teacher E, Female, School B), and that students "can access anything they need"

(Italian Teacher B, Female, School B). One teacher (Japanese Teacher B, Male, School A) highlighted the greater independence that learning technologies provide his students with, as they can "access the Jisho [dictionary] and stuff…(and) can do that independently…that takes less time away from us going around to help". Another experienced Japanese teacher from School A referenced the cultural benefits learning technologies provided her during the COVID-19 pandemic as she facilitated group discussions with her classes by looking at photos and videos of Japan and Japanese life.

As with the previous question, teachers at School B identified positive ways that learning technologies influenced students' knowledge of additional languages; however, three also commented on the negative aspects of this, namely student distraction. An experienced teacher of Italian commented that when she uses videos in class, she notices that students will "glaze(d) over" and that she must be very specific about the number of critical points she wants students to notice because "probably…they're doing other things, messages coming in, emails coming in" (Italian Teacher A, Female, School B). Another two teachers at School B identified that "you can't really escape technology these days" (Spanish Teacher A, Male) and that, while access to learning technologies broadens their students' exposure to content, with that exposure, students often mimic language that is culturally or contextually inappropriate for their stage of learning. "There's a difference between, like, knowledge of something, and proficiency and being able to use it the right way and accurately," one experienced Japanese teacher (Teacher F, Female, School B) said, "they haven't…the general knowledge helps, but sometimes it can be a bit counterproductive…and they haven't got the building blocks to get there".

All nine teachers indicated that learning technologies are supportive resources (Question 4); however, emphasis was placed on the need for them to be complementary to teacher instruction, "used well…and carefully managed" (Spanish Teacher A, Male, School B). Just over half of the respondents indicated that learning technologies supported physical teaching, with one teacher stating, "I definitely wouldn't want to go to a school that had no access or banned the use of technology in language classes…I think it would definitely hinder progress" (Japanese Teacher F, Female, School B). One teacher referred to the support learning technologies provide students with dyslexia (Chinese Teacher A, Female, School B), and two teachers referenced the potential to "make the students more autonomous" (French Teacher A, Female, School B), particularly when using online dictionaries. Despite this, one of the teachers who referenced dictionary use also commented that "it's very easy for electronic programs to spit out a word and not have it be the right cultural or appropriate word" (Japanese Teacher F, Female, School B), again hinting at the need for careful supervision, targeted instruction, and access to teacher support.

The Italian teachers at School B, both proficient users of learning technologies, used this instance (Question 4) in the interviews to draw attention to their belief that despite learning technologies being supportive resources, "in the education system, we keep…pushing teachers to use digital technologies without understanding that

our clientele still aren't using them effectively" and that "using more does not equate to them (students) being effective users of those technologies" (Italian Teacher A, Female, School B). She continued by saying that, while supportive, students' expectations of immediate feedback are "because we have taught them that they are meant to get instant feedback", and so, in her opinion, students are learning exactly the way that we have conditioned them to learn, particularly since COVID-19 lockdowns and the way that education was delivered while students and teachers were separated.

The semi-structured interviews included a question about whether teachers believed students were distracted by learning technologies encountered in class (Question 5). Half of the respondents discussed the amount of distraction associated with the relationship students have with technology, and what boundaries or otherwise exist in the students' homes, with various opinions expressed. For example, three teachers linked the level of student distraction to the need to be explicit with instructions and to mix up activities to manage distraction and behaviour. Two teachers discussed the nature of the students and their ability or inability to regulate behaviour as an influencer on the level of distraction. Another teacher spoke of her belief that students are distracted because society has conditioned them not to expect "much adult interaction because Mum and Dad are…giving them screens and technology" (Italian Teacher A, Female, School B).

Of the five teachers who discussed boundaries, or lack of boundaries in the home, an early career teacher of Spanish (Teacher A, Male, School B) (himself a student who utilised learning technologies during his schooling and university

studies) reflected deeply on why some students struggle to engage when using learning technologies and others do not. In 2021, this teacher taught four Year 8 Spanish classes, each with twenty-eight students. He explained that, across the classes, "some students…they get the iPads open, they take a photo (of the whiteboard), and then they start annotating…then you can see the exhaustion…but they know – I need to do this, I'm going to improve this, I know where I'm going…there's this sort of self-efficacy…within them, they're motivated within themselves to know how to map that out…and there are other students who are just polarised by it (learning technologies)" (Spanish Teacher A, Male, School B). He continued by adding, "I think a lot of that has to do with sort of what the parents are also doing at home…what relationship they have to technology at home…some students have commented that…maybe there's really heavy restrictions on technology at home, and then class time is the time to sort of explore around with it…that could go two ways." He also identified the more contemporary role of teachers acting as 'filters' for the myriad of information that students encounter during a lesson as "it's [learning technologies] yet another avenue of information for them that's coming at them constantly with…messages and emails…my teacher emailed me this, my teacher emailed me that." He stated that he is unequivocal with his students that "using the iPads is a privilege", and that his explicit instructions help students to filter what is and is not important at any given time.

Key Finding 6.8 - Teachers linked students' tendency to be distracted by technology to the relationship with technology in the home and the parameters set by parents or caregivers.

Discussing student distraction further, another teacher (again Question 5), an experienced teacher of Japanese at School B, reflected that for her, the level of student distraction often relates to the students' age and motivation for learning the language. She finds that targeted iPad use with explicit instructions is necessary to keep students on task because, "if you just say, 'go on your iPad' and the task is too vague, and the instructions aren't clear or explicit enough, then that's when they're going to wander…and head in different directions" (Japanese Teacher F, Female, School B). As a teacher of a scripted language, she identified the need to mix up the activities with hardcopy or conversation tasks to keep students focussed on the learning objectives as, "when it's just sitting there constantly, just that screen in front of them…(it's) just tempting them". She added that, in her experience, her older students tend to be more distracted by their learning technologies, not due to gaming but rather due to feeling the need to multi-task and complete work from other subjects and, "that's probably why they're getting so distracted and doing different things is because it's just always open, it's always there, it doesn't always have a purpose…but I find that if you give it a purpose…then you can manage the behaviour more effectively."

In contrast, the teachers from School A indicated that for them, younger students tend to be "a bit more of a challenge" (Japanese Teacher C, Female, School A), and that with "the age groups…we're dealing with…[students] often struggle to focus for extended periods of time on one task" (Japanese Teacher A, Female, School A). When these younger students go off-task, teachers at School A either "stop playing" or use a website that monitors student use and gives teachers "access to what they're looking at on their screen…so you can easily kill whatever it is that

they're not supposed to be doing…" (Japanese Teacher B, Male, School A). Irrespective of whether younger or older students are more prone to distraction when learning additional languages, statements throughout the semi-structured interviews indicated that distraction due to learning technologies is a crucial issue for all teachers, and that strategies to manage and reduce this is essential for contemporary additional languages classroom environments.

> *Key Finding 6.9 – Teachers require explicit strategies to manage and reduce the degree of distraction students experience due to the inclusion of learning technologies in classroom experiences.*

6.3.2 Teacher Perception of Learning Technologies and Their Influence on Pedagogical Practices and Decision-Making

All teachers struggled to respond when asked whether the inclusion of learning technologies in additional language learning programs impacted their professional autonomy to determine the best way to teach languages. The question (Question 10) was initially met with responses such as, "that's a hard question…tricky" (Japanese Teacher D, Female, School A), and "I'm not sure if this entirely relates to the question but…" (Chinese Teacher A, Female, School B), and only two teachers answered the question clearly. One of these teachers emphatically stated, "absolutely!" learning technologies positively impact her professional autonomy as "it definitely gives us way more options…because without…we would have been doing things like using textbooks or photocopied resources, and that's pretty static…but with the digital technologies there's more possibilities to make quick

adjustments and tailor it to whatever the kids are doing…you can quickly whip something up…it gives us a lot more options to differentiate" (Japanese Teacher F, Female, School B).

The second teacher (Spanish Teacher A, Male, School B) observed that while having access to learning technologies provides "lots of good things…(and) takes the burden off us sometimes", on occasion, it challenges his professional autonomy and provides "an element of conflict" as students will challenge him with different ways of using language in the Spanish-speaking world. He then identified that regardless of the challenges learning technologies present him as a teacher, learning technologies "provide you with that creative element" so that students "can create meaning and make it [the learning] meaningful for themselves…I think it's powerful."

Of the eleven respondents to Question 10, two teachers, both from School B, spoke about the flexibility with which learning technologies provide them, and how they use this to cater to their students' needs. While indicating that they have the professional autonomy to make decisions about learning activities in their classes, they both focussed on the work it creates for them to do this. One teacher mentioned students asking for collated vocabulary lists over several years and then said, "maybe I could do that for my…students…I can cater for that" (Japanese Teacher E, Female, School B). Another stated that "having the accessibility and flexibility of annotating and writing on content and materials…has changed my way of teaching", and that "now what I do is I would get the class to brainstorm and talk about ideas and then write it all annotated over the PowerPoint and then I would email that to them…and when there are texts in class that we're reading, I would often record myself reading

it…and send(ing) that to students…[so that they] not only can enhance their listening skills but also the speaking pronunciation skills as well"(Chinese Teacher A, Female, School B).

The creation of additional teacher work due to learning technologies was noted in teacher responses when asked whether they believed student use of learning technologies has changed over the last three to four years (Question 7). While answers to the question about teacher autonomy generally indicated that professional autonomy remained for teachers, the responses to this question indicated that twenty-five per cent of interviewees see the autonomy of students declining due to the incorporation of learning technologies into teaching and learning programs. One teacher stated that, three to four years ago, students "were more self-motivated to do things and they would write things down…and they would take information…whereas last year (2020, significantly impacted by COVID-19) … I feel like they depend(ed) on the information presented rather than taking it" (Italian Teacher B, Female, School B). Another teacher, also a teacher of Italian, indicated that her students took more ownership over their work when they had to write more physically. Now, with increased learning technology use, she needs to emphasise to her students that they need to take ownership of their learning process "because now…they're expecting you to give it [the content] to them" (Italian Teacher A, Female, School B).

Key Finding 6.10 - Learning technologies have the potential to influence teachers' professional autonomy in positive and negative ways; however, as content and activities can easily be 'given' to

Based on the eight teacher responses to Question 7, the integration of learning technologies into additional languages education has become more familiar to students over the last three to four years. At School B, using an iPencil to complement iPad use has been widely adopted by students and is now commonplace in the lower secondary years of schooling. IPads as the primary learning tool are also well entrenched in the operational and pedagogical ways of working within School B. An experienced teacher of Japanese (Teacher F, Female, School B) reflected that, "in the beginning, it (the iPads) was a real gimmick…it was a reward that you did when all the 'real' work was over…whereas now I feel like it's become more of our routine and more of our way of working and…organisation…it's become more embedded…so it's not just the little carrot that you dangle at the end of the lesson, it's actually part of the workflow". Another teacher, new to School B commented that, "since starting here, there's certainly an element of efficiency…and how well the kids know, 'I use this for this, I use that for that'…that's very clear to them, and so as someone entering into that, it becomes clear to me 'Oh, OK, so if these kids know what they're doing then I also can know what I'm doing'" (Spanish Teacher A, Male, School B).

Key Finding 6.11 - When used with purpose, clearly articulated workflows, and teacher involvement, learning technologies increase efficiency and learning experiences for teachers and students.

The ways that students and teachers used digital tools and programs during the COVID-19 lockdowns in 2020 and 2021 indicate changing relationships with learning technologies. Some of the engagement strategies used by teachers during that time have continued now that students and teachers are in face-to-face classrooms again. When asked about this atypical teaching and learning period, teachers indicated that the engagement levels of their students varied considerably (Question 8). Three teachers commented that this period was difficult for senior students and students who thrived in a face-to-face environment. They commented on how they worked around this by changing their approach to using digital resources, and these strategies have continued now that students are back in the school's physical environment. One teacher of French (Teacher A, Female, School B) noticed that her Year 12 students at the time, "who did not want to use technology", "seemed to love…reading aloud on the different parts of the story (cartoon strips)." Another teacher (Italian Teacher A, Female, School B) also mentioned the power of choral work because it is inclusive and encourages participation without drawing attention to individual students. She said that she "make(s) sure that the resource isn't shared" and so "I point, you speak…it settles them well…and I share it [the resource] at the end…at the actual time I just need to know that they are engaging and that there can be no excuses…and they like the sound of their own voices." One of the respondents noticed that her students responded positively to the videos she created during lockdowns that explained content because they could view them as many times as they needed to and work at their own pace. Post-COVID, she has continued to provide content to her students in this way because, "they can't sit and listen to me…for a whole lesson", which is "very sad." She uses the time that students are

engaging with the content on their iPads to wander the classroom and be "one-on-one with students…because I'm bored myself…(and) it's in…building the relationships with them" (Italian Teacher B, Female, School B).

However, seeing how some of their less-engaged students learned at home during the lockdowns was eye-opening for other teachers. One teacher commented that during this period, she noticed that, "some of the kids that [who] would normally sit there and fly under the radar and not…participate face-to-face in the lesson were submitting all [of] their work…they were actually submitting more work than they were in class…that was a really interesting lesson for me to be like, 'oh wait, this kid's actually really capable, but he just gets distracted'" (Japanese Teacher F, Female, School B). Another teacher commented that, "what did surprise me were the few students that [who] prefer working individually…[who] didn't work as well in class because there was much distraction around them…they actually got all the work done…but it definitely wasn't the majority" (Chinese Teacher A, Female, School B).

Ten of the teachers interviewed responded to whether they still use 'traditional' language learning methods, even when digital options are available (Question 6). One teacher mentioned the importance of keeping traditional methods on hand as a contingency plan for when technology fails, another indicated that she uses kinaesthetic activities to trigger a more significant emotional response in students, thereby aiding the retention of information, and another discussed her use of dual-coding or drawing to reinforce students' knowledge of language elements.

Eight respondents to Question 6 mentioned deliberately instructing students to write by hand; however, they provided different reasons for doing so. All six

Japanese and Chinese teachers referenced the importance of asking students to write by hand, with books and paper, to learn Asian characters. Of note, even when their students had the option of practising their characters with a device and a stylus, they all insisted that their students "retrieve that information for themselves" (Japanese Teacher E, Female, School B) by writing on paper, as "our tests are still handwritten…so handwriting is still a really important skill for them" (Japanese Teacher F, Female, School B), indicating that there remains a misalignment between teaching and assessing practices. In addition to this, a teacher of Chinese added that she expects her students to "bring notebooks and pencil cases, and we do all the writing in their books, regardless if they've got [an] Apple pencil or not" (Teacher A, Female, School B). This was because she cannot tell whether the students write the characters with the correct stroke order when they use a digital device and stylus. Despite her students complaining about it "a lot," they "don't have the temptation to look back at the notes or use Google Translate…it limits the distraction…there's no messages coming in," and it forces the students to "rely on themselves a lot more" (Chinese Teacher A, Female, School B).

The other teachers who referenced the importance of designing activities that require students to write by hand cited alternative reasons for doing so. Three teachers mentioned the importance of developing fine motor skills, and conditioning students to be able to complete lengthy assessments and tolerate when "their hands get tired…you need to keep that muscle memory, muscle dexterity" (Japanese Teacher F, Female, School B). Another teacher emphasised the ownership she sees when her students handwrite material as, "the pressure and the resistance (of the pencil on paper) and feeding back into primary school memories…some of them

love…going back to their handwritten notes" (Italian Teacher A, Female, School B). In addition, a second teacher of Italian commented on the clutter when there is too much on the screen, and for that reason, "you need your notes beside you…you've got to grab a booklet…where you've made your mistakes…you've got everything there" (Italian Teacher B, Female, School B). She indicated that when students work exclusively on a screen, "you can't go and flip through this, flip through that…you [the teacher] don't even know where they [the students] are, you can't even see them [the notes], they're hidden, so it has to be stuff that you can actually pull out…that you've made yourself" (Italian Teacher B, Female, School B).

Key Finding 6.12- Teachers continued to encourage physical writing activities in schools to aid content retention, increase accuracy of target language writing conventions (such as character stroke order and punctuation), and mimic assessment conditions.

Over the course of the semi-structured interviews, and when referring to different questions, three teachers shared that they believed students engaged with learning activities more seriously when they were presented with hard copies. All teachers discussed the use of paper copies as a behavioural and pedagogical strategy. When responding to Question 6, Teacher E explained, "in afternoon lessons…I think it's because I've actually made the effort to print it out" (Japanese Teacher E, Female, School B) or, as Teacher B elaborated when responding to Question 8, because "I want them concentrating…when they have paper, it's an exam, so they concentrate…I think maybe that's the only time they see paper – for assessment

because they just keep quiet" (Italian Teacher B, Female, School B). When asked why they thought this, one teacher indicated that her Year 9 students become "super excited because they get their verb book next year…an actual hard copy…an actual book…they are super excited that they will have something that starts at the beginning and you go through to the end…with digital devices and programs they don't know where they're going" (Italian Teacher B, Female, School B answering Question 2). All three teachers believed that because activities in hardcopy are now less frequent, when students are presented with an activity on paper, there is a certain gravitas about it that necessitates stronger focus, engagement, and effort.

Key Finding 6.13- Teachers believed students take learning activities more seriously when working with hardcopy.

Keeping up with changing learning technologies is a consideration for all contemporary additional language teachers (Question 12). "It's not going away any time soon, and so we're trying to make it as relevant as we can for the kids and be part of that world", commented one teacher (Japanese Teacher D, Female, School A). Another, from School B, acknowledged that, "in the past few years…we've really had to learn" (Japanese Teacher E, Female, School B). All eleven teachers interviewed felt compelled to respond to the question that asked them to reflect on what they thought about the notion of 'keeping up' with learning technologies used in schools and additional languages education. Two main themes emerged in the responses. First, the importance of maintaining practical knowledge about learning technologies and how they can change or influence teaching and learning practices, and the ability

to discriminate effectively to determine how best to use or not to use these technologies. Half of the teachers discussed the need to keep up with advances in learning technologies and why it is essential. One teacher said that she does not "want to be my [her] mother…she can't use technology and…appears to be out of touch" (Japanese Teacher A, Female, School A). Another indicated that she could not know how well she will "adapt to something when…[she does not] know what that is…so I'd like to think that I'd embrace it and go with it" (Japanese Teacher F, Female, School B).

Second, the ability to purposefully select which learning technology to use and having the professional autonomy to do this was another powerful theme, with half of the respondents referring to this. Spanish Teacher A observed, "I think there's a degree of caution and curiosity at the same time" (Male, School B). French teacher A commented, "being able to discriminate between what we perceive to work or not, or what actually works or not with our students" is a good thing, focussing on the need for teachers to adapt (Female, School B). These teachers saw the importance in not "adopting technology for technology's sake" but ensuring that the learning technologies used are "the right fit for the purpose, and it has to achieve the goals you are after" (Japanese Teacher F, Female, School B).

Key Finding 6.14 - Teachers appreciated the importance of keeping up with the changing pace of learning technologies, but also the professional autonomy to determine which learning technologies were suitable for their teaching and learning programs.

6.3.3 Teacher Perspectives on the Quality of Feedback Provided to Their Students via Learning Technologies

During the semi-structured interviews, teachers reflected on the nature of the digital feedback their students receive when engaging with learning technologies (Question 11). Nine teacher respondents indicated that automatic feedback is very helpful to students when completing lower-order tasks, such as practising and recalling vocabulary or Asian characters. However, one teacher made the distinction that once the work becomes more complex than recognition or recall, there can be a conflict for students between their results on learning applications and their assessment results, as these are not complementary or indicative of the time they have spent on the application.

Again, the notion of students' preference for paper-based activities was raised in the conversation by an experienced teacher of Japanese. She noticed that "it really depends on the student... sometimes what they see on paper actually stands out more to them than what comes up digitally" (Japanese Teacher E, Female, School B). This teacher and another two teachers commented on the rigidity and limitations of the accepted answers in digital programs, especially in programs such as *Education Perfect*, where students are expected to spell words accurately to be marked and recorded as 'correct'. While accurate spelling is an important skill, if the task is to ascertain whether the student comprehends the word, successful demonstration of understanding is not necessarily dependent on them spelling the word correctly in English, particularly when student populations in schools can include significant proportions of students from non-English-speaking backgrounds as they did at School B. Teachers can work around this by placing misspelt answers or any potential

possibilities into the programs however, "that will take us another few hours to go through every list and change everything" (Japanese Teacher E, Female, School B). Although frustrated by the rigidity of such programs, one teacher identified that, "with the emotions, that anger (at the answer being marked as incorrect) …it actually does stick in their minds" (Japanese Teacher F, Female, School B).

In response to the same question, three teachers commented on the importance of facilitating processes whereby students are forced to engage with their feedback to take advantage of the opportunity to identify their areas of success and opportunities for improvement. Both Italian teachers at School B discussed ways that they ask their students to spend time with their feedback, this time from the program *Socrative*, to correct their mistakes, speak to, assist, and collaborate with their peers, and then do the task again to see if they have improved. "Feedback is not helpful when it's ignored," said one teacher, "so not giving the time in class to… allow students to revise sends a message that…mastery… isn't valuable" (Italian Teacher A, Female, School B).

Finally, despite her response being in a different question (Question 6), an early-career Chinese teacher identified that, "*Showbie* is great with giving feedback because everything's all there" (Chinese Teacher A, Female, School B). This response stood out to the interviewer as it highlighted, even before discussing metacognitive skills and awareness, that teachers are sometimes oblivious to their role in curating effective learning sequences and learning opportunities for their students through learning technologies. Instead, they see the learning technologies and applications as the providers of these experiences without giving themselves credit for how they

have expertly and professionally crafted the academic programs for their students to lead them through robust metacognitive processes. *Showbie*, as an application, relies on teachers to curate learning materials and activities for their students. Any feedback provided to students is done by the teacher *through* the program but not *by* the program.

Key Finding 6.15 - Teachers identified that students enjoy receiving automated feedback; however, providing students with guided opportunities to engage and reflect on that feedback is essential for learning.

6.3.4 The Influence of Learning Technologies on Students' Metacognitive Awareness of Language Learning Processes (Teacher Perspective)

Half of the teachers interviewed indicated that they do not believe learning technologies influence students' awareness of metacognitive processes relating to learning additional languages (Question 9). "The short answer is no," said one teacher, "I don't think there's enough 'meatiness' to the technology to be able to help them think about how they learn…they're almost passive to a point when they're engaging with those tools" (Japanese Teacher A, Female, School A). "I'm gonna say no," said another, "I think the teacher is the essential element in teaching them how to learn languages…the teacher has to say, 'this is why we're using this one, this is what you're going to learn from this'" (Japanese Teacher F, Female, School B). Three of these teachers, while indicating that they do not believe learning technologies influence

students' metacognitive awareness, struggled to articulate why that was the case, and provided rationales primarily based on how students learn curriculum content.

Four teachers were quite unsure in their responses, and again cited examples involving students using learning technologies to aid in the engagement and learning of content rather than by fostering and enhancing knowledge of learning strategies (cognitive) to direct and self-regulate their learning (metacognitive). One example of this is a statement by an early-career Spanish teacher from School B who identified that, "there's an element of communication required for language, and I think we [the teacher] deliver that…technology is powerful in certain ways, but it doesn't develop complete proficiency or acquisition". Despite clearly articulating his response, he apparently misunderstood the intent of the question. Teachers confused by the question also mentioned things such as the interactive language supports offered by digital textbooks that enable students to "hover over a word…and maybe something pops up" (Japanese Teacher B, Male, School A), and another discussed "show(ing)…students videos on YouTube that are about strategies on how to learn Chinese and how to practise writing" (Chinese Teacher A, Female, School B). Again, as with the students during their interviews, some teachers struggled to distinguish between using learning technologies for learning curriculum content as opposed to using learning technologies to support cognitive processes and enhance metacognitive skills and awareness.

When answering Question 9, the role of the teacher in developing student metacognitive awareness was mentioned by three of the teachers interviewed during Phase 3 and alluded to by another two. However, the connection between

metacognitive strategy and metacognitive awareness in these responses was not explicit. Irrespective of whether learning technologies are a part of the learning experience, the three teachers mentioned the importance of the teacher's role in developing their "cognitive maturity…and…make [ing] a routine" (French Teacher A, Female, School B) for learning, as well as the importance of teachers harnessing their "wisdom and that knowledge of what it is to be a second language learner and then" using the technology as "the tool that you can guide them to use" (Japanese Teacher F, Female, School B).

Key Finding 6.16 - Teachers did not believe that learning technologies effectively skill students HOW to study languages as, without teacher involvement, student engagement can be passive, incohesive and lack intent.

6.4 Summary

Students and their teachers value learning technology use in additional language teaching and learning; however, both groups acknowledged limitations. While using learning technologies to source study and teaching resources, teachers and students identified that face-to-face experiences were preferential for revision or extension work, conceptually challenging work, and maintaining concentration. The rapport between students and teachers was highlighted in the responses of both groups, and the value of teacher expertise was emphasised, as without it, the groups believed that the potential for student errors increased, and student efficiency decreased. The

likelihood of maintaining or improving the degree of student autonomy also decreased.

Students and teachers acknowledged the potential of learning technologies to distract them, and the importance of having access to explicit teacher instruction. Students and teachers appreciated the choice to incorporate 'traditional' strategies for learning and teaching and opportunities to mimic assessment conditions, so much so that teachers believed that students take their learning more seriously when presented with activities in hard copy. Students and teachers identified the importance of incorporating opportunities for handwritten work as it increases concentration and participation, aids in content retention and knowledge of writing systems, and mimics assessment conditions.

Despite evidence of cognitive and metacognitive strategies in the collected data, students and teachers struggled to distinguish between them or even name them explicitly. Responses from both groups focussed on methods used to learn or teach content rather than strategies used to reflect on student progress and adjust student approaches to learning. Learning technologies and the automated feedback provided by some programs were viewed favourably for their ability to engage and assist students in their content retention rather than for guiding current or future approaches to learning. Teachers indicated, however, that learning technologies do not effectively guide students through processes relating to how they learn, as, while helpful for content retention, their engagement with learning technologies is often passive, interrupted and lacking in intent.

Chapter 7 reviews the research questions and draws together the evidence from the survey, classroom observations, and interviews. Key conclusions are presented in addition to areas for further investigation, and the need for an intervention that addresses the disconnect between learning technology use, and cognitive and metacognitive processes will be discussed.

Chapter 7 – Discussion

"Metacognition is part of the fabric of successful learning, but it can prove both complex and subtle. It is ever-present in the classroom, but unless teachers have a strong understanding of the metacognitive demands of the topics they are teaching, they may miss opportunities to develop pupils' knowledge and skills."

(Quigley et al., 2021, p. 11)

7.1 Introduction

Grounded in additional languages education, the issues investigated in this current research include student and teacher perceptions of learning technologies and their influence on student learning, engagement, and achievement; student and teacher autonomy regarding learning technology use; student and teacher perceptions around the quality of feedback and agency; and the influence of learning technologies on student metacognitive awareness. Chapters 4, 5, and 6 presented the key findings from the surveys, interviews, and classroom observations. This chapter presents and discusses nine key conclusions drawn from the findings. These are organised around:

- Student's perceptions of the influence of learning technologies on their learning, engagement, and achievement (Research Question 1),

- Teacher perceptions of the influence of learning technologies on their pedagogical practices (Research Question 2),

- Impact of learning technologies on student learning and achievement (Research Question 3),

- Student and teacher decision-making as it relates to their use of learning technologies (Research Question 4), and

- Influence of agency and learning technologies on student metacognitive awareness (Research Question 5).

This research was focused on determining the impact learning technologies have on student metacognitive awareness and, as identified by Quigley et al. (2021), unless teachers are cognisant of the complexities associated with developing student metacognitive awareness, opportunities for development, potentially by students *and* teachers, may be missed. Recommendations for further research and how the teaching community can respond through pedagogy to the key findings are also discussed.

7.2 Influence of Learning Technologies on Student Learning, Engagement, and Achievement (RQ1)

This research indicates that students enjoy learning additional languages*;* however, access to and use of learning technologies are separate from their reasons for this. Students responded consistently regarding their enjoyment of language learning in both the survey and the interviews – 93% of survey respondents indicated a *high* or *very high* level of enjoyment. This observation was reinforced during the interviews as 83% of student respondents also indicated enjoyment when learning languages. Learning technologies were *not* cited as a reason for this at either data collection point.

The positive influence of teachers on their students, and supportive teaching and learning environments are central to students' enjoyment of and engagement in additional languages education. This finding corresponds with the work of Resnik and Schallmoser (2019) who, by researching university-student participation in Electronic Tandem Language Learning (eTandem) environments, found that supportive learning relationships (in this case between learning partners) fostered authentic language input and cultural insight, and above all else, greater enjoyment when learning additional languages. Enjoyment in learning languages was a sentiment conveyed by students in the survey and observed during classroom visits. However, in the interviews, as reasons for enjoying their studies, students focused on the relationships between languages, the potential for using languages when travelling, and how languages can assist them in understanding cultures more deeply. This indicates that the use of, and interaction with technology does not in itself influence students to pursue additional languages. Rather, it is the prospective engagement with others and opportunities to better understand different communities that drive their interest in languages. These sentiments were also apparent in the survey. Despite the absence of these ideas when asked directly in the interviews, there was evidence in the student survey responses that are also confirmed in other studies. These include students' relationships with their teacher (Martin, 2010; Yu et al., 2016), the professional knowledge and explicit instruction provided by teachers (Thompson & Mutton, 2023), and the importance of nurturing and inclusive classroom environments (Graham, 2019; Smith, 2018).

Learning technologies can distract students of additional languages. In both the surveys and the interviews, students and teachers acknowledged either the

potential of learning technologies to distract students or cited learning technologies as a definitive distractor to students. This acknowledgement of the distractive potential of learning technologies supports the findings of Tindell and Bohlander (2011) who found, by way of a survey of tertiary students, that 80% of the sampled students agreed that multitasking in class (in this case by misusing mobile phones) decreased their ability to concentrate. Classroom observations in this current study confirmed the distractive potential of learning technologies with some senior students by either engaging in digital activities unrelated to lessons (such as games, emails, and class work for other subjects), or by being distracted by their learning technologies that were not operating properly due to issues such as poor connectivity or battery life. This conclusion supports findings reported by Gonski (2020), who stated that 84% of Australian teachers believe learning technologies are a growing distraction for students and that they are a "constant...distraction from classroom tasks" (p. 5).

The survey data indicated that students' awareness of the potential of learning technologies to distract increases as students become older. In the interviews, all respondents either identified that they become distracted by learning technologies or that there is the potential for distraction, supporting myriad studies and reports related to the detrimental impacts of technology use (Gonski Institute for Education, 2020; Graham & Sahlberg, 2021; Terry et al., 2016). However, due to the significant difference in the participant numbers for this question (seven in Year 11 and two in Year 8) and combined with the observation data that also showed more significant distraction of students in the higher years, it cannot be definitively concluded that student awareness of potential distraction due to learning technology

increases with age. However, this is worthy of future investigation due to the high-stakes nature of senior secondary schooling, and the dominant presence of learning technologies in tertiary and workplace institutions.

The differences in the levels of distraction in the classes may have also been due to the amount of teacher supervision and instruction, which was more explicit and prevalent in the classes for younger students. Regardless, the potential influence of distraction due to learning technologies combined with variables, such as student age and the nature and amount of teacher instruction, are essential contributors to additional language classroom environments of which teachers should be cognisant and monitor. The combined evidence across the three phases of data collection indicates a link between learning technology use and student distraction. This supports the findings of McCrindle and Fell (2021), and further emphasises the need for students to be provided with supportive, structured classroom environments. In these environments, with professionally nuanced, explicit teacher instruction and roaming supervision, distraction is minimised, and students are more likely to engage in their learning when using learning technologies for additional languages education and potentially other areas of the curriculum.

Learning technologies contribute significantly to students' perceptions of how they acquire knowledge of additional languages and why they are successful in learning. All students rated themselves between *average* and *excellent* in how they perceived their academic ability in their target languages. Most students (93%) believed themselves to be between *intermediate* and *expert* users of learning technologies, and 63% felt that their knowledge of additional languages was primarily based on their use of learning technologies, and this was supported by student

interview responses. All eight students who responded to the question indicated that access to and use of learning technologies was central to their learning of additional languages.

Students also indicated in both the survey and interviews that when they are separated from learning technologies for any reason, learning languages is difficult, they feel less able to learn, and they also find themselves forced into using more 'traditional' methods of study. In the interviews, students referred to recording handwritten notes in books, mimicking assessment conditions by practising on paper, learning content on paper and then practising it online. Almost half of the student survey respondents (47%) indicated that they self-test digitally to revise vocabulary or determine areas of their learning that require improvement or revision. Seventy-five per cent of student interview participants identified that learning technologies are vital to their language revision or extension activities. Despite agreement that learning technologies were essential to language learning, across the student and teacher responses and the observations, it was evident that a face-to-face and professionally nuanced learning experience was preferred by students for new or challenging work. This finding supports the work of Stoian et. al.(2021), who found that students liked e-learning and face-to-face learning for different reasons, and so, post-pandemic, education systems must give serious consideration to pursuing blended learning approaches to reap the benefits of both forms of instruction.

Key Conclusion 1: Most students identified that learning technologies were vital for language learning; however, these technologies are also either distracting or have the potential to

distract them. Face-to-face, professionally nuanced, and explicit teacher instruction and supervision are essential for maximising student engagement when learning additional languages, with or without learning technologies.

7.3 Influence of Learning Technologies on Teachers' Pedagogical Practices (RQ2)

Teachers acknowledged that learning technologies influence their pedagogical practices, and while this can present challenges, they do not see this as a negative influence. Across the data sets, there was evidence that teachers source learning activities using digital technologies, a finding supported by the OECD publication *Shaping Digital Education* (2023). Fifty per cent of teacher survey respondents indicated that they do this *often,* and in the interviews, teachers also spoke about the flexibility digital technologies provide them in sourcing curriculum material, and a range of digital materials was also evident in all classroom observations. However, how these materials were integrated into classroom experiences, and the students' learning experiences varied significantly, and reflected the personal preferences and pedagogical practices of the teachers and schools in which they worked. Given the increased complexities for teachers working in contemporary education settings and often across different modes (digital and face-to-face), teachers look to digital technologies to increase their professional efficiency. While a range of digital resources were referenced and observed in the classrooms, their quality and educative value were not assessed and remain a potential area for further investigation.

Digital resources, although supportive, need to be complemented by explicit teacher instruction and supervision, supporting the need to consider a blended learning approach (Mizza & Rubio, 2020). The potential of using material from learning technology programs (content and testing functions) was evident in all three study phases. However, during the surveys and semi-structured interviews, participant teachers noted the limitations of these and the need to supplement these programs with "the human connection and (the) communicative element of language acquisition" (Phase 1, Spanish Teacher A, School B). Teachers across all levels of experience agreed that, while learning technologies supported their pedagogical practices, the human connection with students was more important than having access to digital resources. It is the rapport established with a student group that acts as the conduit between a one-dimensional experience and meaningful, informed language learning. Roaming supervision is also necessary to keep students on task and utilise their learning technologies purposefully.

Well-entrenched and impactful classroom routines were observed in lessons and described in survey responses and interviews. These included entry and exit routines, technology protocols, and explicit teacher instructions to direct student activities in the classroom. Despite varying across languages and schools, these routines were a combination of personal preference and experiential know-how, demonstrating that where there was a combination of manual and technology-based activities, the mobility of teachers was a significant factor in minimising student distraction. As with the tertiary educators mentioned by Flanigan and Babchuk (2022), most teachers with impactful classroom routines approached their interactions with students proactively by clearly establishing expectations and working consistently to

support them, rather than by reacting to inappropriate behaviour and damaging their rapport with students.

> *Key Conclusion 2: Best practice when teaching additional languages involves combining manual and technology-based activities with explicit instructions and roaming supervision to minimise student distraction.*

7.4 Impact of Learning Technologies on Student Learning and Achievement (RQ3)

Like the English language learners in Lee et al.'s (2022) meta-analysis of over 4000 participants, the students in this research also showed that they link their successful language learning with access to learning technologies. Digital devices and software access can expose students to differentiated content, reference materials, and contemporary and real-world examples of language use in written and spoken mediums. Learning technologies also provide opportunities for students to self-test and revise their work. Across all phases of the study, students either engaged with learning technologies in this way (observation data) or wrote or spoke about myriad ways to utilise the expanse of digital resources provided to them by their learning technologies. However, when this access is disrupted through a lack of connectivity or by removing a device or program by a school, teacher, or circumstance (such as forgetfulness), student engagement and their ways of working during learning experiences will likely decline. This is due to the potential for student distraction, or

the emotional and academic stress associated with the disruption or cessation of learning technology access.

As learning technology use is well established in the schools that participated in this current study, access to digital devices and programs, as this research shows, provides students with comfort and stability. When this is disrupted, the impact is significant and impacts what students perceive as being *successful* in their learning. There is not yet literature available relating directly to the disrupted access of Australian students to learning technologies, and so this remains an area that warrants further investigation. Understanding students' perspectives is essential to help them critically and purposefully use the learning technologies by which they are surrounded. The Gonski Institute of Education will release their Phase 3 report in the future, representing the perspectives of children and young people, as opposed to those of teachers (Phase 1 Technical Report) (Gonski Institute for Education, 2020) and parents (Phase 2 Technical Report)(Graham & Sahlberg, 2021). This information will be incredibly valuable to Australian teachers and will supplement the information gathered as a part of this research.

Key Conclusion 3: Students link successful language learning and revision with access to learning technologies, and when separated from these, engagement and productivity with learning experiences can decline.

Regarding student achievement, few of the interviewed students distinguished between their academic performance and their use of learning technologies or connected them. When asked whether students believed their

academic performance was linked to their use of learning technologies (Question 2), students provided responses that emphasised the place of learning technologies in accessing various resources and providing them with platforms to revise curriculum content. However, students' answers to this question also highlighted the importance of the teacher's role in learning, and why the combination of teacher professionalism and knowledge remains tethered to and an essential component of successful engagement and achievement in additional languages education. The success of learning technologies as a component of classroom activities, as discussed by Lo and Miller (2020, p. 106), can "often rely on the personal motivation of individual instructors, support structures to integrate technology, and the individual learner." For these reasons, it is imperative that schools continue to look for opportunities to develop and support their staff in digital competencies and link them to modelled examples of pedagogical implementation.

In all phases of the study, teachers acknowledged the place of learning technologies in contemporary language education. Like the students, they emphasised the importance of concurrent teacher guidance, input, and expertise to ensure an appropriate, meaningful, and purposeful learning experience. While all teachers expressed their belief that their students' knowledge of additional languages was largely due to interaction with learning technologies, they too were reluctant to suggest that their students' academic performance was significantly linked to their use; however, this was not due to a reluctance to answer the question. Teachers provided many reasons why learning technologies, although supportive, were not significantly linked to student academic success. This was due to their belief that, for students to find engagement with digital resources purposeful or for the

feedback provided by digital programs to be informative and actionable, teacher input and guidance (whether face-to-face or via digital platforms) was essential. This was to ensure that students were utilising learning technology feedback and experiences with purpose and in a way that meaningfully informed their language learning.

Key Conclusion 4: Teachers acknowledge the supportive role digital technologies play in students' learning and assessment preparation; however, they emphasise the critical role of teachers in linking these experiences with the steps necessary for deep learning and academic success.

7.5 Student and Teacher Decision-Making as it Relates to Their Use of Learning Technologies and Digital Feedback (RQ4)

Student and teacher agency (or autonomy) was a key focus of this study. This was to investigate whether the inclusion of learning technologies in teaching and learning programs had influenced how students and teachers make decisions about their working and learning practices, and whether the presence of learning technologies had impacted their desire or ability to make pedagogical and learning decisions. This line of enquiry provided many insights from both students and teachers and is an area that warrants further investigation.

Across all phases of this research, it was evident that students make clear choices about how they use learning technologies when studying additional languages, even when their choices indicate misinformation, a lack of necessary

information, or a metacognitive strategy. In the survey, students stated that they used learning technologies for self-testing, revision, and supplementary resources. The survey provided initial information about students' reliance on digital programs for feedback, which either reassured them that they were learning accurately or helped them to identify gaps in their learning. The survey provided the first indication that all students did not see feedback provided by learning technologies as being overly helpful, and so they made decisions to use other methods for learning – in particular, keeping notes in hardcopy or revising and practising content by hand, be that pencil and paper, or device and stylus.

Student agency was also observed during multiple classroom visits, particularly regarding note-taking strategies and students' tasks when deciding not to follow classroom instructions. The student who chose to type her responses also deliberately chose to disable the autocorrect function and not activate the target language keyboard, resulting in her work containing Spanish punctuation and accent errors. While it was potentially easier on her cognitively to ignore her mistakes, her decision-making at that moment denied her the opportunity to practise writing accurately in Spanish and lengthened the time it took her to understand the concept she was studying. Similarly, students who demonstrated their agency by multi-tasking with digital games, checking email, or sending and receiving messages also chose to behave in ways that distracted them and did not strengthen their understanding of the lesson content. Information gathered during the student interviews also showed the ease with which students were distracted by their learning technologies and subsequently made decisions that derailed their learning.

Holistically, the importance of, and potential impact of student agency on learning was evident across all data phases, supporting the findings of Weinmann et al. (2023) who stressed the importance of student autonomy and collaboration for successful participation and engagement in learning activities. The findings in this current research also emphasise the significance of establishing supportive classroom (and digital) environments providing opportunities for students to be autonomous in their learning, the incorporation of purposeful teacher-student or student-student conversations, and the modelling of robust, individualised metacognitive processes to support student learning. These could occur in real-time or retrospectively when examples of successful or flawed student attempts to self-regulate their work have been collected.

Students indicated that their sense of autonomy remained when using learning technologies; however, not all their teachers agreed with them—a quarter of the interviewed teachers stated that they had noticed a decline in student autonomy due to incorporating learning technologies into school academic programs. Reasons for this included noting students' tendencies to take greater ownership over their work when they were physically required to write more and organise their resources. Some teachers also suggested that students are less dependent on their teachers when they have a notebook that contains organised or sequenced records of learning experiences that they use for reference and revision, rather than disorganised files on a device. While these insights were not supported in the other phases of the study, there was evidence in the student data to suggest that the way students work varies considerably, and that establishing some consistency of practice rather than giving students too much choice could be one way of reducing the

cognitive load associated with decision-making and supporting students in their learning. Should note-taking be digital, or if students choose to keep digital notes, they require support and guidance in establishing and maintaining their digital resources. This stance; however, contrasts with the position of the OECD (2023) which encourages the use of learning technologies for the design of differentiated, granular, and individualised forms of learning activities and assessments, and in doing so, promotes student and teacher autonomy in digital teaching and learning.

Key Conclusion 5: Conversations about student agency and examples of successful and flawed decision-making can and should occur in real-time and retrospectively after learning activities have been completed, and the teacher has evidence to speak to.

Access to learning technologies has impacted teachers' choices of pedagogical strategies; however, they have not significantly altered the content with which they work nor reduced the number of manual activities used in the classroom. Throughout this current study, teachers indicated that they felt a strong sense of professional autonomy to incorporate learning technologies into the design and implementation of classroom learning experiences in ways that best suited the educational needs of their students, supporting the findings of the OECD (2023). In this study's survey, 70% of teachers indicated that they preferred more traditional methods of teaching and learning, and this was also demonstrated in the classroom observations. This was further elaborated on during the semi-structured interviews, as teachers explained that they use traditional or manual activities to aid memory

retention (with handwriting or by triggering emotional responses) as well as to minimise student distraction, maintain muscle dexterity, encourage peer interaction, and prepare them for hard-copy assessment items.

Key Conclusion 6: While access to and use of learning technologies has broadened the range of classroom resources available to teachers, their inclusion has not eroded teachers' capacities to differentiate where needed and provide bespoke learning experiences for their students.

This research shows that student engagement solely with automatically generated feedback impacted the quality of the decisions they made about how they learn additional languages, supporting the work of Ryan et al. (2019) who emphasised the importance of personalised, detailed, and usable feedback. Despite enjoying their interaction with digital programs that automate feedback, students indicated that feedback generated by technologies was often vague and unhelpful, as this form of feedback detailed only *what* they needed to learn rather than helping the students understand *how* to go about it. Students still valued and sought out the expertise of their teachers to guide their learning as it was this nuanced, professionally informed ability to link the *what* with the *how* that students still recognised as a requirement of successful language learning.

Key Conclusion 7: Students consider automatic feedback generated by digital language programs to be one-dimensional; however, individualised feedback, regardless of how it is conveyed (digitally, in person or hardcopy), is more meaningful and helpful to them.

7.6 Influence of Agency and Learning Technologies on Student Metacognitive Awareness (RQ5)

Since the 1980s, learning technologies have been a feature of Queensland school education; however, it has been since the mid to late 2000s that there has been a marked increase in the ratio of devices to students and superior connectivity to the Internet. The global COVID-19 pandemic saw an increase in the reliance on student access to learning technologies, with most schools now expecting students to have access to a mobile device (laptop or tablet), whether provided by the family or the school.

A key focus of this research was to ascertain the influence of learning technologies, and the agency that comes with using such devices and programs, on students' metacognitive awareness of language learning processes. Metacognition has been identified as "part of the fabric of successful learning, but it can prove both complex and subtle"(Quigley et al., 2021, p. 11). In both the survey and interview phases of the study, students demonstrated that they required greater metacognitive awareness of language learning processes as they struggled to distinguish and articulate the difference between learning content and the metacognitive strategies they use for learning content. This supports Quigley et al.'s

(2021) view that teachers may miss opportunities to develop their students' metacognitive knowledge and skills if they do not have a strong understanding themselves.

In their responses to questions regarding metacognitive awareness and the ways that learning technologies assist students in learning, students overwhelmingly focused on how the devices and applications assisted them in accessing and organising the content they were studying rather than referring to the skills they were using to learn. Students did not indicate an awareness of metacognitive strategies such as retrieval practice, spaced practice, and interleaving (Sumeracki et al., 2023; Weinstein & Sumeracki, 2019) that are often embedded into the programs used. Rather that the programs indicated progress by showing them what they did and did not know and provided them access to content and techniques they needed to work on further. The only explicit reference students made to a metacognitive practice was when they discussed the role of writing for memorisation; however, they did not raise this as a discussion point in the interview question relating to metacognitive strategies. Instead, students discussed the importance of writing when discussing whether they use traditional language learning methods instead of digital.

Overall, students did not demonstrate that they critically engage with the programs they utilise for learning additional languages, and they have little understanding of why they work the way they do. While students valued the role these programs and devices played in their retention of linguistic knowledge and their ability to explore language beyond the classroom walls, students did not understand how and why these strategies worked. This indicates that there is a distinct need to build the

capacity of students to understand strategic, cognitive, and metacognitive concepts that underpin the programs they are using for additional language learning and for other curriculum areas.

Key Conclusion 8: Students demonstrate a need for cognitive and metacognitive awareness as they find it difficult to distinguish and articulate the differences between cognitive strategies, related to learning content, and metacognitive strategies, related to their efficacy.

In both the survey and interview phases of the research, there was evidence that, like students, teachers also confuse the concepts of content development, cognitive strategies, and metacognitive skill awareness. Most teachers identified metacognitive awareness of language learning processes and the learning of content as two distinct skills. These teachers, and even those who struggled to articulate themselves when asked about metacognitive strategies, effectively demonstrated the use of such strategies in their teaching sequences; however, there was little evidence of explanations to students about how the activities they were facilitating and in which the students were engaging related to metacognitive strategies. This indicated that while teachers can distinguish the purpose of one activity from another and can themselves see the connections between learning activities and the acquisition of language knowledge, there remains an opportunity for teachers to build their capacity around grounding these experiences for learners with strong explanations of why and how they work. This finding supports the work of Wang et al. (2021) who recognised that integrating metacognitive and engagement strategies

is not necessarily the easiest of tasks, but that their presence makes a difference to engagement and self-control. The sharing, discussing, and modelling of these strategies and processes by teachers with their students potentially enables the development of awareness and application of metacognitive skills that are transferable across curriculum areas.

Key Conclusion 9: Most teachers identified metacognitive awareness of language learning processes and content learning as two distinct skills and demonstrated the use of metacognitive strategy in their teaching sequences. Despite this, they did not adequately explain to students the relationship between learning activities and metacognitive skills to develop their metacognitive awareness and cognitive skill set at the time of instruction.

7.7 Summary

This research surfaces the need for teachers to engage more frequently in reflective practices relating to the integration of learning technologies in contemporary language learning education. Moreover, the findings of this research highlight the need for resources specifically designed to support teachers and students to assess and consider the application of learning technologies and the affordances and constraints associated with these for enhancing cognitive and metacognitive learning.

The key findings and conclusions are drawn from the data obtained in this study; however, caution must be employed before generalising the findings across all populations. All efforts were taken to "develop evidence with high validity and

integrity, which is a precondition of any generalisability goal" (Polit & Back, 2010, p. 1457) and to enable "reasonable extrapolation" (Patton, 2002, p. 489). The findings, however, prompt educational institutions and individual teachers to reflect on their current pedagogical practices and carefully amend their teaching and learning programs to utilise learning technologies to minimise student distraction, maximise student engagement, and embed valuable knowledge of metacognitive strategies for learning.

With these goals in mind, the following chapter proposes and discusses two original frameworks for learning and engaging critically with learning technologies for metacognitive awareness. The purpose of these is to propel language education forward in contemporary ways that promote critical engagement with learning technologies for content retention and to emphasise the importance of an understanding and awareness of cognitive and metacognitive processes applicable across curriculum areas. Using these frameworks, the skills associated with using technologies for learning will be made more explicit, and these will be linked to how metacognitive strategies can and should be used by learners.

Chapter 8 – Digital Engagement Frameworks for Learning and Metacognitive Awareness

"Although we don't yet know everything about the most effective learning environments, the existing research on metacognition and motivation provides clear and strong evidence that activating students as owners of their own learning is an essential component."

(Wiliam, 2018, p. 178)

8.1 Introduction

Evidence collected in this research suggested that, for the most part, students 'do', but do not necessarily 'engage' with, learning technologies as well as they could or need to for effective learning, and for content retention and retrieval to occur. Embedding conversation, exploration, and examples of how to do this more effectively are important for the progression of pedagogical practice in all curriculum areas – not just within the additional languages space. The insights revealed in this research indicated that students, while appreciating access to learning technologies for their study of additional languages, were also distracted by them and lacked awareness of the explicit skills that assisted their learning, as discussed in Chapter 7.

In this chapter, two original frameworks are proposed to be used by students and teachers as potential supports or interventions for these issues. These original frameworks were developed out of the research and are reflective of the findings, however they still require validation, potentially as a part of future research. They reflect the need for, and potentially provide ways for teachers to, as Wiliam suggests,

"engineer effective learning environments for students...to ensure that learning is proceeding in the intended direction" (2018, pp. 55-56). The frameworks actively position the student in learning activities that facilitate a deep consideration of the relationship between the task-at-hand, relevant and transferrable cognitive and metacognitive strategies, and the role of learning technologies in completing learning activities or assessments. As reminded by Wiliam (2018), what is known about metacognition is that positioning students at the centre of their own learning is an essential part of creating effective learning environments. These frameworks aim to provide teachers and students with the tools they require to action this concept more explicitly. Further research would enable the investigation of their effectiveness and validity.

The first framework, referred to as the *Digital Engagement and Metacognitive Awareness (DEMA) Framework*, suggests a structure for teachers and students to plan teaching and learning experiences that link technology use to the guiding learning taxonomy and objectives, and concurrently embeds cognitive and metacognitive processes. The second framework, the *What's the Point? (POINT) Framework*, is less sophisticated, and is designed specifically for students to link technology use to cognitive and metacognitive strategies. Both frameworks address the need to explicitly connect digital pedagogies with cognitive and metacognitive processes, potentially supporting a deeper understanding of how learning technologies support teaching and learning processes, and how the skills gathered through these processes can be transferred from additional language learning to other curriculum areas.

8.2 Digital Engagement Frameworks for Teachers

8.2.1 The Digital Engagement and Metacognitive Awareness Framework (DEMA)

The *Digital Engagement and Metacognitive Awareness Framework (DEMA)* (Figure 8) is designed for teachers in the planning stages of their learning or student assessment experiences; however, it can also be used by teachers with their students if the project or problem being investigated warrants its use. Based on Engagement Theory, first proposed in 1998 as a "conceptual framework for technology-based learning" (Kearsley & Shneiderman, 1998, p. 20), the DEMA Framework links an organisation's or individual's learning taxonomy with learning technologies such as communication tools. It encourages teachers (and students) to intensely scrutinise the digital resources that are available to them and their students, ensuring that those selected are fit-for-purpose (i.e., appropriate for each stage in the learning cycle), and enable students to complete the task in a way that maximises 'engagement' as opposed to 'doing' the task in a compliant but passive way. This is an essential step, as the nature of digital programs, applications, and access to devices frequently changes between and within schools. Regularly reviewing and re-calibrating intended learning experiences involving learning technologies is crucial in ensuring that teachers are correcting or not making assumptions about students' abilities, or neglecting to factor in classroom or home-learning activities that explicitly demonstrate *how* learning technologies are used for parts of learning or assessment sequences, relating these activities to relevant metacognitive strategies.

Figure 8

Digital Engagement and Metacognitive Awareness (DEMA) Framework
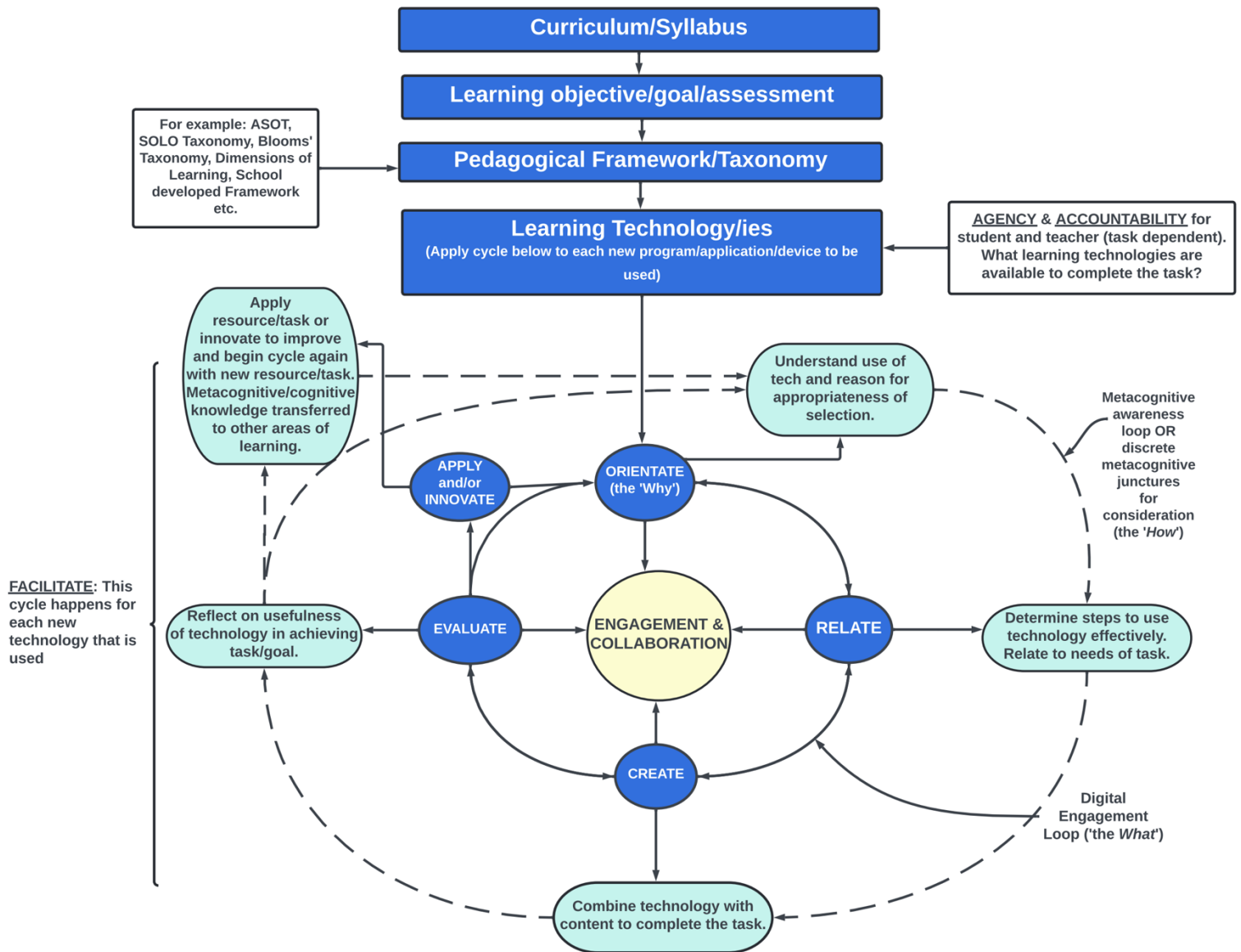
Note: Original Framework developed by Ashlee Bruce, based on the work of Kearsley, G., & Shneiderman, B. (1998). Engagement theory: A framework for technology-based teaching and learning. Educational Technology, 38(5), 20-23.

In the late 1990s, Kearsley and Shneiderman (1998) suggested that learning resulted due to engagement with technologies and proposed Engagement Theory as a way of explaining this. Grounded in constructivist frameworks, situated learning theories, and Problem-Based Learning (PBL) approaches (Boss & Krauss, 2007), Engagement Theory was a response to the increasing presence of learning technologies in the classroom, and their utilisation for electronic or distance education environments (Kearsley & Shneiderman, 1998). Email, Internet-based notice boards, telephones, and fax machines were examples of technology at the time, and they also referenced, as a futuristic possibility, the notion that "desktop video (may) become popular as a means for inexpensive face-to-face interaction in a distributed learning environment" (Kearsley & Shneiderman, 1998, p. 21). Less than ten years after publication, the number of devices in Queensland schools had increased significantly, and with the arrival of COVID-19 in 2020, 1:1 student-to-device ratios were commonplace as a solution for delivering curriculum to students remotely due to school closures.

Engagement Theory is based "upon the idea of creating successful collaborative teams that work on ambitious projects that are meaningful to someone outside the classroom" (Kearsley & Shneiderman, 1998, p. 20). The Kearsley and Shneiderman framework of the 1990s focusses on three components - *Relate*, *Create*, and *Donate*, each with a distinct focus. *Relate* emphasises collaboration and champions communication across teams, planning, management, and the development and use of social skills. *Create* channels PBL approaches and focusses on making activities creative and purposeful, with students defining their projects and then focussing their efforts to complete them. The final component, *Donate*, is

grounded in authenticity and making the project as realistic as possible. The role of technology in Engagement Theory is to increase and incentivise participants with the ease and extent of interaction and, with the increasing popularity of the Internet, make the projects realistic enough to be shared virtually with peers or broader communities. There is no mention of metacognitive processes in the first iteration of Engagement Theory.

Where Kearsley and Shneiderman (1998, p. 23) praised the ability of learning technology to "do sophisticated and complex tasks" and emphasised "the positive role that technology can play in human interaction and evolution", they did not and could not have predicted the extent of learning technology inclusion in contemporary classrooms. The digital tools created three decades ago enabled students to perform complex tasks quickly and, in many ways, did the thinking for them, which was at the time considered exciting, efficient, innovative, and futuristic.

Today, based on the evidence collected in all phases of this research, advances in the capabilities of digital tools (e.g., generative AI) have the potential to de-skill and possibly limit students' thinking and creative processes due to their unprecedented automaticity. Further to this, as the presence of artificial intelligence increases in education, the need to utilise learning technologies in ways that enhance "human-centred approaches to pedagogy" (Miao et al., 2021, p. 1) also increases. The DEMA Framework (Figure 8), developed in response to this research, is designed to leverage the potential of learning technologies whilst ensuring that connections remain between the task-at-hand, the metacognitive and cognitive skills required of participants to complete the task, and the 'human connection' essential for highly supportive and successful teaching and learning environments.

The DEMA Framework is based on the premise that learning technologies occupy a much grander space in contemporary classrooms than in the time of Kearsley and Shneiderman's (1998) Engagement Theory and, therefore, must be carefully scrutinised and used with purpose, intent, and clearly articulated instructions and expectations. The needs of students are different, and so, when considering how learning technologies are used in the classroom, "we need to keep in mind that what is harmful for some, can serve as a creative revelation to others" (Graham & Sahlberg, 2021, p. 5). For this reason, flexibility is built into the frameworks so that teachers can use as much or as few learning technologies as desired, or as they have access to. Regardless of the nature of the learning technologies used, if carefully scrutinised and then facilitated with students in a purposeful and intentional way, the development of cognitive and metacognitive awareness can occur through the digital engagement process and the resulting learning experienced.

The DEMA Framework aims to illustrate that if learning technologies are vetted carefully, and used with explicit instructions and expectations, student and teacher learning and the development of metacognitive awareness and technical knowledge are more likely to occur, and engagement will be evident throughout the task. The Framework is comprised of four components – the Curriculum or Syllabus; Learning Objectives, Goals or Assessment; the Pedagogical Framework or Taxonomy (e.g., Bloom's Taxonomy (Bloom et al., 1956) or the Structure of the Observed Learning Outcome (SOLO) Taxonomy (Biggs & Collis, 1981); cognition and learning frameworks such as Dimensions of Learning (DoL) (Marzano, 1992), or The Art and

Science of Teaching (ASOT) (Marzano, 2017)), and finally, the learning technologies and engagement process, which is unique to the DEMA Framework.

The first part of the *Digital Engagement and Metacognitive Awareness Framework* requires teachers to carefully consider the curriculum, learning, or assessment objectives and map them to the pedagogical approach or framework. At each stage in the learning process, teachers should consider what learning technologies they (and students) have access to and whether the task will require more than one program or device. The purpose of the activity or assessment will determine where in the framework the task commences. For example, when completing a 'low-level task' such as identifying vocabulary, students may require access to a device, a digital dictionary application, or a website and have the necessary target-language keyboard skills. For a 'high-level', complex task such as the creation of a multi-modal presentation spoken in the target language that evaluates and synthesises a series of other texts, supplementary or different learning technologies, programs, or applications may be required as students move through different phases of learning from low to high level. In addition, so that students are not mindlessly interacting with their devices and learning programs and 'doing' the work without 'engaging' with the purpose of the work, explicit instruction from teachers is essential to ensure students know *how* and *why* they are using the learning technologies. The need for these explicit instructions to support metacognitive awareness was evident in the research and is supported by the *Metacognition and Self-Regulated Learning Guidance Report* (Quigley et al., 2021).

Teachers can build targeted activities within their learning sequences to ensure that student skills are being developed over time and so that the skills

required for any task or assessment are familiar to the students. Access to appropriate learning technologies will be dependent on funding and resource availability. Ideally, teachers will plan in ways that minimise the number of learning technologies required for any given task to avoid over-complication; however, if multiple learning technologies are required, then the 'engagement' phase of the framework will need to be repeated for *each* of the learning technologies. This is to ensure that an appropriate audit is completed - mapping student skills, lack of skills, and the time needed with each learning technology. Repeating this phase also enables teachers and students to map, recognise, or acknowledge skill or content-based assumptions that require addressing for the task to be successfully completed.

Where Kearsley and Shneiderman's (1998) Engagement Theory includes three distinct principles that result in student engagement (*Relate*, *Create*, and *Donate*), the *Digital Engagement and Metacognitive Awareness Framework* contains two distinct cycles – the *Digital Engagement Loop* (Figure 9), which represents the actions of students (or the 'doing') and concurrently, the *Metacognitive Awareness and Engagement Loop* (also Figure 9), which represents the metacognitive processes (or the 'reflecting and thinking') parts of the cycle. Within these, five phases of learning are present, and a sixth (*Facilitate*) encompasses them all, as it represents the implementation of the dual cycles.

Four phases are at distinct points in the *Digital Engagement Loop* cycle (*Orientate, Relate, Create*, and *Evaluate*), and one is at the endpoint (*Apply and/or Innovate*). Engagement and collaboration lie at the centre of the *Digital Engagement Loop*, as they do not occur due to three distinct components as in the original theory,

but instead, they occur as a result of the inter-relationship of the six phases working in a cyclic or complementary fashion rather than as a linear progression.

Orientate

Orientate is the initial component in the Digital Engagement Loop. At this point, teachers (and students if appropriate) consider the task requirements, learning objectives, and the learning technologies available. In schools, the available learning technologies may vary significantly. They may be significant in number or functionality, strictly prescribed or restricted by the organisation due to safety or pedagogical concerns. Learning technologies (or lack thereof) may also be tied closely to the school community's socio-economic status, so equity issues must constantly be critiqued, and tasks altered to ensure that all participants have access to the same resources and can engage with those in the same way.

During the *Orientate* phase, when previewing the task, teachers might also discover that their desired learning technology is not available or accessible or that time is needed to be built into the learning sequences to develop student skills to use a particular learning technology effectively. For example, during one of the lesson observations (detailed in Chapter 5), an issue relating to a student's ability or willingness to type in the target language was identified, and so, by identifying whether students could accurately type in their target language prior to the activity, a range of suitable prompts, examples and supports could be put in place to differentiate the expectations for students at varying levels of typing capability. All situations require careful, contextualised, and nuanced consideration and these

frameworks, particularly the DEMA Framework, aims to make this process for teachers as easy as possible.

By taking the time to carefully preview or review a task, match the needs of the task to the learning taxonomy or pedagogical framework, and then consider which learning technologies are available and suitable, teachers can identify their blind spots or assumptions early in the planning process, and allocate time or skill development activities at appropriate junctures in learning sequences to address any deficits. Chorrojprasert (2020) suggests using surveys for gathering information prior to task commencement; however, a strong knowledge of the cohort involved, their existing skills, and the resources that are available would still result in having the necessary information for successfully orienting a group prior to a learning task. When matching the needs of the task to the learning taxonomy or pedagogical framework in use, teachers might also identify that more learning technology is required than first thought or assumed, and then consider whether the skills required for students to use these competently are already in place or require further development. Teachers could also choose to simplify the requirements of the task. Importantly, it is essential at this point in the *Digital Engagement Loop* that the learning technologies are scrutinised for their purpose and limitations, and that teachers carefully articulate to students *why* they are approaching the task in a particular way, and *how* the learning technologies relate to the success criteria or skills being developed. This step supports *Key Conclusion 1*, which highlighted the distractive potential of learning technologies, and the importance of face-to-face, professionally nuanced, and explicit instruction to maximise student engagement.

Figure 9

Digital Engagement Loop (DEMA)
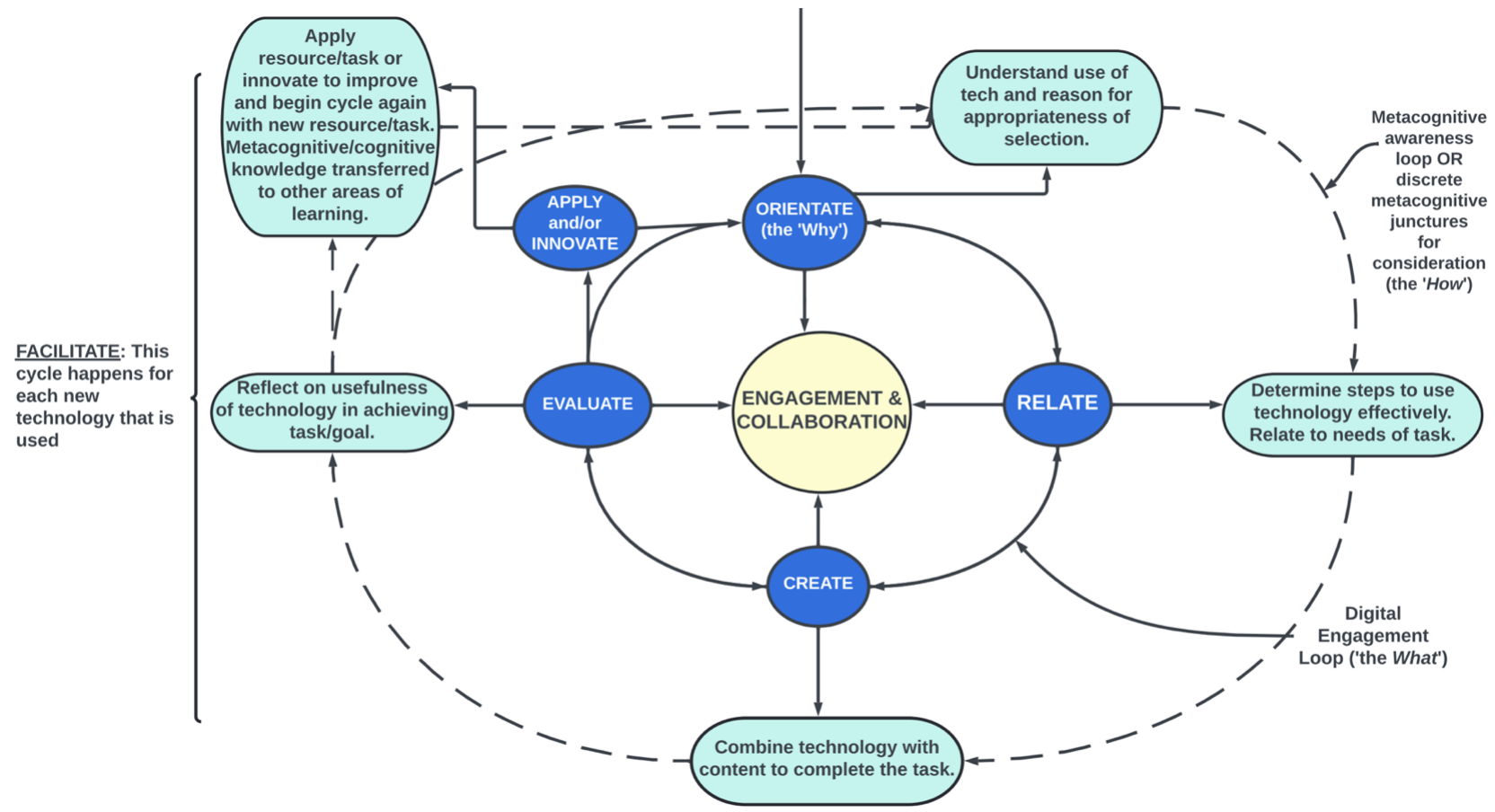
NOTE: Digital Engagement Loop is the key cycle within the Digital Engagement and Metacognitive Awareness Framework, to be repeated as many times as necessary within a teaching and learning task.

Relate

*A*s identified in the surveys and interviews, students are not always aware of why they are using a particular program or application for language learning, and only relate its use to content retention and practice. *Relate* is the component in the *Digital Engagement Loop* where the facilitator (be that teacher or student) matches the specific requirements of the task to the learning technologies that will be used (determined in the *Orientate* component). Again, with engagement and collaboration at its heart, this part of the loop requires conversation, questioning, brainstorming, and forward-thinking. It is the scaffolding, or the 'anticipatory set' for the task, relating the specifications of the task to the learning technologies that will be used to complete it. Writing about problematic and addictive technology use, D'Angelo acknowledged that, "adolescent minds and bodies do not have the strength or endurance to compete with the grip of digital technology, and so it is up to...adults to provide the scaffolding adolescents need to find success" (2020, p. 394).

At the *Relate* stage, facilitators would check participants' access to the learning technologies required, assess their skills with those technologies, and clearly articulate to them what scaffolding is in place and why the intended process is most suitable or efficient (representing *Key Conclusion 4*). The *Relate* phase in the *Digital Engagement Loop* is an optimum time to engage *with* participants and answer any 'why' questions; drawing parallels between the future actions of the task and the metacognitive processes that anchor those actions to deep learning and understanding.

Create

As in the 'Create' phase in Engagement Theory (Kearsley & Shneiderman, 1998), participants are tasked with using and applying learning technologies to synthesise their ideas, creating a completed task. When participants enter the *Create* phase in the *Digital Engagement Loop*, they focus on purposefully combining the learning technologies with curriculum content to complete the project. Again, as in Engagement Theory, there is a strong focus on collaboration in this phase; however, collaboration in the *Digital Engagement Loop* does not always have to be as a smaller group, with a group project being the result. Kearsley and Shneiderman (1998) referenced placing completed student work on the 'Web' as a motivator for participants; however, as contemporary teaching and learning applications and programs enable digital collaboration and interaction in real-time, the interaction and engagement with learning technologies need not wait until the completion of the task.

Rather, tasks requiring digital and face-to-face collaboration can occur in real-time within a single teaching space or in multiple locations (as was experienced during the COVID-19 pandemic), with participants using their own devices but being prompted by a facilitator (using applications such as *Padlet* or *Mentimeter*). What remains central to the *Digital Engagement Loop* is the metacognitive focus and the onus placed on students' metacognitive skills to 'create' their work, both during the creative process and as a final product. The use of explicit instruction, detailed by Quigley et al. to "describe all the activities that a teacher orchestrates to affect learning in their students" (2021, p. 13), is also essential for connecting actions such as planning and monitoring with metacognitive regulation strategies, and to

encourage participants to recognise and discuss them. This phase supports *Key Conclusion 5,* which emphasised the importance of maintaining conversations about successful and flawed decision-making and relating these to evidence within student work.

Evaluate (Pre-Evaluate or Post-Evaluate)

Evaluate is a phase in the *Digital Engagement Loop* that does *not* appear in the original Engagement Theory. Evaluation is an essential part of the loop for all participants, because it is in this phase that teachers or students reflect on the usefulness of each learning technology in achieving its purpose. Despite Bloom researching well before the introduction of learning technologies in classrooms, he stated that evaluation, "is directly related to the teaching-learning process as it unfolds can have highly beneficial effects on the learning of students, the instructional process of teachers, and the use of instructional materials by teachers and learners" (1969, as cited in Wiliam, 2018, p. 36). This perspective remains relevant when using learning technologies in the *DEMA Framework*, as the efficacy of the previous phases is assessed, with a view to task completion or by moving to the next learning technology used in the task and repeating the cycle. Purposefully including explicit time for participants to reflect honestly and openly on their work, and the learning technologies they have selected for such work, is imperative for pedagogical development, task refinement, and normalising that when errors are made, the learning from these can positively impact future practice. In both the surveys and interviews, the research reflected a lack of student understanding relating to the need, use, and efficacy of learning technologies in their curriculum

activities, and therefore, building in time to lead discussions with students around these aspects of digital learning is essential in rectifying this deficit. As Timperley et al. (2014, p. 6) explain, adopting a curious and evaluative mindset can enable participants "to work out what is working well so you can build on it, and what is not working well so that you can make changes".

The timing of the *Evaluate* phase impacts the way it informs task management and development. If the *Digital Engagement Loop* is used *prior* to task commencement, the *Evaluate* phase works as a pre-evaluative process to identify potential blind spots for teachers or to determine the possible result of proceeding without thoroughly examining assumptions made by stakeholders. Task variables such as time, student or teacher skill or effort, student or teacher absence, and technology failures, can impact task completion significantly, so engagement in a 'feed-forward' process, such as those described by Hattie and Timperley (2007) and Brooks et al. (2019), can potentially rectify issues before they become problematic and assist students to develop more self-regulation of their learning processes, strategies, and processes for engaging with the task and reflection on what they do, and do not understand.

Similarly, valuable information can still be obtained and acted upon if the *Evaluate* phase is completed either during or after the task is complete. To refine practice, it is necessary to identify when celebration is warranted for the productive and successful use of learning technologies, or acknowledge when structural, procedural, or user errors have negatively impacted the efficacy of a task. In the same way the *Evaluate* phase works prior to a task commencing, engaging in a critical reflection during or after a task also provides opportunities for facilitators and

participants to identify the successful inclusion of learning technologies (*Evaluate –*
Apply), or errors of judgement or critical assumptions made regarding the selection
or use of a chosen learning-technology (*Evaluate – Innovate – Apply*). Even during a
task, if identified errors are significant enough to warrant innovation, it is at this
juncture that participants (teachers or students) can determine whether corrections
are necessary before moving forward, or whether the practical and metacognitive
learning from these errors can be transferred to other learning areas. This phase
supports *Key Conclusion 8*, which highlighted the need for students to distinguish and
articulate the differences between cognitive and metacognitive strategies and relate
them to their learning.

Apply and/or Innovate

Apply and/or Innovate is the final phase in the *Digital Engagement Loop*. It is
at this point in the cycle that participants (teachers or students) determine if the
section of the task is complete (*Apply*), and they can move forward to whole-task
completion or move to the next section of a complex task (back to *Orientate*) or,
conversely, participants determine what changes are required before the following
steps occur (*Innovate*). Alternatively, and importantly, *Innovate and/or Apply* also
refers to the opportunity for participants to apply the metacognitive knowledge
gained by using learning technologies and the *Digital Engagement Loop* to other tasks
or to consider different, new ways to use the learning technologies and skills in the
same or different curriculum areas.

There are opportunities in the *Apply and/or Innovate* phase for teachers and
students to make explicit connections between curriculum areas and real-world

examples by discussing, explaining, and outlining how the employment of a metacognitive skill and strategy, coupled with technologies, can make a significant impact on one's general, or targeted productivity and the wider community. It is important for there to be safe, regular opportunities for teachers and learners to question their behaviours, beliefs, and approaches to teaching and learning, and adjust or reconceptualise if deemed necessary. This phase also supports *Key Conclusion 8*, in addition to *Key Conclusion 4*, which focussed on the need for teachers to link the role of technologies to deep learning and academic success. The *Apply and/or Innovate* phase is important for teachers to review their pedagogical approaches and amend if necessary.

Engagement and Collaboration

Engagement and Collaboration lie at the centre of the *Digital Engagement Loop.* With appropriate facilitation and discussion, these elements should occur concurrently throughout the process of using learning technologies and linking metacognitive strategy and awareness to their use. As Chorrojprasert (2020) identifies, without students having discussions about their chosen strategies, and engaging with explanations on the cognitive factors relating to their learning, it can be difficult for them to realise how the strategies correlate with their learning and academic success. *Collaboration* during the *Digital Engagement Loop* cycle is essential, as it is through collaboration with teachers, peers, and family members that a deep understanding of content, metacognitive strategies, and the practical applications and limitations of learning technologies can be achieved. While collaboration was specifically identified in the *Create* phase, it is also necessary

throughout the whole *Digital Engagement* Loop as without *Collaboration*, facilitators risk one-dimensional 'doing' of a task and the possibility that 'teachable moments' are overlooked. Students can collaborate with group goals in mind - *as* a group (working together to produce a group assignment), or *in* a group (exchanging ideas but producing an individual piece of work) (Wiliam, 2018). In addition, as evidenced from the data collected in this research, a *lack* of collaboration can result in a lack of engagement, as collaboration with teachers and peers motivates students more than access to and the use of learning technologies.

To illustrate how the *Digital Engagement and Metacognitive Awareness Framework* could be used in an additional language education space, a Year 12 assessment task has been mapped to the framework (see Appendix 5). Based on the 2019 General Japanese Syllabus (Queensland Curriculum and Assessment Authority (QCAA), 2017), Part 1 of this task (Part 2 is a spoken conversation) is an assignment that requires the student to create a multimodal presentation in response to three target-language stimulus texts. The pedagogical framework used for this task is the SOLO Taxonomy (Biggs & Collis, 1981), which leads students through five stages of learning, the most complicated of which is the *Extended Abstract* stage, which is required by this task due to its complex nature. For a task that requires progression to the *Extended Abstract* stage of the taxonomy, such as creating an original target-language text that evaluates and synthesises a series of other texts, supplementary or different learning technologies, programs or applications may be required for students to complete the task. Explicit and sufficient instruction from teachers is also fundamental in ensuring that students know how and why they are using the learning technologies in such a way. The document supporting this process (Appendix 6)

assists teachers to identify their learning technology assumptions, such as student

keyboard skills, basic importation of documents for annotating, and online dictionary

skills. It also identifies the learning technologies that require targeted and explicit

instruction, combining cognitive and metacognitive strategies to make the learning

processes easier for students (Siregar, 2023). In this case, explicit instruction links

learning activities and processes to stages in the SOLO Taxonomy (Biggs & Collis,

1981) and metacognitive processes that require development and connection to the

task.

8.2.2 "What's the P.O.I.N.T?" Framework

The second original framework, again a framework influenced by the research

in this study, is the *What's the P.O.I.N.T? Framework (POINT)* and is a five-point

process for students and teachers in the classroom (see Figure 10). 'POINT' is an

acronym for *Process* (or Pedagogy), *Ownership*, *Intent* (or Initiative), *Name the*

Thinking (Cognition/Metacognition), and *Transfer the Skills*. This framework requires

students to move through a guided series of steps to ensure that they know what

they are doing, why they are doing it, the cognitive and/or metacognitive strategies

used in the activity or assessment, and finally, how these strategies can be

transferred to other pursuits. Identifying these learning components and then

transferring them to other areas can increase awareness of metacognitive strategies

and encourage students to be more critical in terms of how they utilise their learning

technologies in their education. The different parts of the POINT Framework also

reflect the *Key Conclusions* established in Chapter 7.

Figure 10

What's the P.O.I.N.T? Framework for Students and Teachers (POINT)

Process (students) AND Pedagogy (teachers)	• What is the best way for me to approach this task? • What steps are involved in getting from A to B (or start to finish)? • What content is required? • What skills are required?
Ownership	• Do I have a choice to make here? • Why am I making *this* choice (as opposed to another)? • Why has the teacher made this choice for me? • Why is this the best/most efficient etc. way to approach this task? • Are there any questions I need to ask to understand the task and the processes better? • What devices, applications, resources (digital or otherwise) and/or programs do I have to help me complete this task? • What can I control, what can't I control?
Intent/Initiative	• How am I best going to achieve this task? • What devices, applications, resources (digital or otherwise) and/or programs do I have to help me complete this task? • What is my timeline for this task, and what and when are my key checkpoints?
Name the thinking/strategy (cognitive and metacognitive knowledge and awareness)	• What technique/approach have I chosen for this task? • What technique/approach have I been asked to utilise for this task? • Why is that technique/approach the most appropriate? • How does the technique/approach/strategy help me learn? (Not a 'what' (content), but a 'how' (skill and process-based)) • What steps do I need to take, and in what order?
Transfer the skills	• (Prior) What cognitive and metacognitive skills do I already know that can help me with this task? • (During and After) How can the skills I am developing/have developed during this task help me in my other pursuits?

This framework is deliberately less complex than the *Digital Engagement and Metacognitive Awareness Framework*. It is designed for students (with the assistance of their teachers) and prompts them to engage with a series of questions to avoid passive or surface-level compliance and engagement with learning and assessment tasks. It encourages attention and awareness, ownership, the distinction between the content needed and the metacognitive strategies needed for task completion, and then prompts students to consider how the learned or practised skills can be transferred to other pursuits. The questions at any given time can and should be amended to suit the context in which it is being used, ensuring that the questions used are appropriate for the age and skill of the cohort.

By asking the question, "What's the POINT?" this framework is designed to be easily remembered by students (and teachers) and transferrable across curriculum areas. Each of the five letters is accompanied by several reflective questions (adaptable to context) that prompt students to think about the actions they are taking, why those actions are important and relevant to the task, the purpose of the task, metacognitive skills and strategies that are being developed, and how students' obtained knowledge can be applied elsewhere. These prompts promote active engagement in a task using learning technologies and reduce the likelihood of surface-level engagement by students. These prompts also work for the teachers involved, reminding them to discuss each of the five areas rather than assuming that students have made the connection between the content, purpose, actions, and strategies themselves. It is in this way that teachers continue to make pedagogy "the driver" and learning technologies "the accelerator" (Fullan, 2019, p. 45), ensuring

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that "the best of human effort" is paired with "the best of machine (or learning technologies) effort" (Broussard, 2018, p. 175).

For students, *'P'* stands for *'Process'* in the framework, and for teachers, *'P'* stands for *'Pedagogy'*. By determining the best process or pedagogical approach to a task, students and teachers can preview what is required in terms of skills and content, and map out the steps required to move from start to finish (in a lower-level task), or from Part A to Part B in a task with greater complexity. The research findings highlighted the challenges students encounter when aligning a learning technology to a reason for its use, or the more impactful ways of using the technology for learning. Mapping out the process early potentially simplifies the experience for students and can positively impact a student's sense of preparedness and procedural confidence. For teachers, mapping out the pedagogical requirements of a task ensures that they have a clear sense of the strategies needed. At this early stage, the pedagogical framework or learning taxonomy is referenced to the task, and the tasks' activities are mapped to the learning technologies available. The *Pedagogy* or *Process* step in the POINT Framework most closely links with the *Orientate* Phase in the DEMA Framework; however, is potentially more accessible for students.

'O' represents *'Ownership'* over a process. The research revealed that students appreciate and value their sense of agency or autonomy, so it is important for them to know when there is a choice to be made, and when student choice is not an option. The importance of autonomy and its links to engagement have been well documented in academic literature, with notable contributions from Chorrojpraser (2020), Fredricks et al. (2004), and Zimmerman (2002). Even more important in

collaborative activities is understanding *why* decisions have been made. As mentioned previously, D'Angelo (2020) emphasised the need for adults to provide the scaffolding required by students to experience success with learning technologies and so, by relating the needs of the task to the actions of students by asking questions such as "Do I have a choice to make here?", "Why am I making this choice?" or "Why has this teacher made this choice for me?", participants (students and teachers) can view tasks from both perspectives, gaining valuable insights into the pedagogical or metacognitive reasons behind such choices. By also asking a question such as "What can I control, what can't I control?", students can be encouraged to determine the levels of automaticity in the learning technologies they use. They can consider what kind of data and algorithms are used by the learning technologies to mimic metacognitive processes that once would have occurred manually and remain valuable skills for students to develop and retain.

'I' stands for *'Intent'* or *'Initiative'*. Like *Ownership*, the *Intent/Initiative* stage relates to the student's sense of control over the task; however, it is tethered more to timelines and achievement goals than the tools used to complete a task. At this stage, students can map out the key components of the task and any associated checkpoints linking these to their calendars or schedules. This juncture also allows teachers to check students' organisational strategies and intervene should there be evidence that students lack awareness of these.

'N' refers to a student's ability to *'Name the Strategy/Thinking'* and is the part of this framework where the cognitive and metacognitive strategies are named early in the task or later by discovery or experimentation, and awareness of these are developed. This is an essential step in the POINT Framework as the current research

highlighted a significant need for students to be cognisant of and evaluate the efficacy of the strategies they engage with for learning. Literature connecting learning technology use with metacognitive awareness is significantly under-represented in academia, and so this is a crucial aspect of this framework to support student learning.

During this stage, the cognitive and metacognitive skills are the focus rather than the curriculum content, and the link between these can be established and explained explicitly. This current study indicated that it was clear that students, and to a lesser extent teachers, struggled to articulate how learning technologies assist in learning (and processing) content. This stage encourages students and teachers to consider the cognitive and metacognitive strategies they employ to complete tasks and link them to successful teaching and learning behaviours. In terms of the need for metacognitive aspects represented here, these are supported by the work of Sumeracki et al. (2023), Weinstein and Sumeracki (2019), and the work of the Education Endowment Team (Quigley et al., 2021).

'T' is the final stage in the POINT Framework and stands for *'Transfer the Skills'*. Before a task commences, students can reflect on their knowledge of metacognitive skills and determine whether they already have a clear, metacognitively strategic plan for task completion or a deficit in their knowledge. If the questions related to this stage are asked during or after the task is completed, they will form an alternative purpose, as the emphasis will not be on skills and techniques that are already well-established, but rather shift to *how* the skills developed during the completion of the task can be applied elsewhere. Schools can assist teachers and students in this process by mapping cognitive and metacognitive skills across the various curriculum

areas, and encouraging staff to converse, share their practices, and constructively critique each other's work to look for opportunities to build awareness of cross-curricular pedagogical and metacognitive strategies. Importantly, as learning technologies continue to evolve, it is necessary to link the use of these with teaching and learning strategies and identify the role that learning technologies play in supporting these.

8.3 Summary

Evidence from this research suggests that there is a need for teachers and students to be more engaged with targeted metacognitive strategies that relate to the use of digital resources in terms of delivering and studying curriculum content and, further to this, promote the discussion of such strategies. Frameworks for supporting the development of teaching and learning or for providing a structured approach to support reflective practice are well known, for example, the Spiral of Enquiry Framework (Timperley et al., 2014) or the TPACK (Koehler & Mishra, 2005) and SAMR Frameworks (Puentedura, 2009, cited in Howell & McMaster, 2022, p. 35) for technology integration.

The presentation of these two new frameworks for digital engagement and metacognitive awareness aims to provide teachers and their students with tangible processes that support and encourage a critical examination of the role learning technologies play in teaching and learning activities. Although untested, these frameworks highlight the importance of the physical act of 'doing' the work being tethered to the metacognitive strategies required to do so. They also have the potential to prompt participants to use learning technologies in informed,

contemporary ways whilst maintaining student and teacher autonomy and the human connection that remains crucial to successful teaching and learning activities.

These frameworks provide a platform for participants to challenge their assumptions, identify their blind spots, and act upon any skill or knowledge deficits to strengthen not only the technological skills of students and teachers, and increase the efficacy and knowledge of metacognitive strategies. Ultimately, engagement and collaboration lie at the heart of both frameworks and remain the prized result of informed, purposeful, and nuanced learning technology use. The findings from the current study do not explicitly lead to the verification of the assumptions made in the presented models. They do however, offer a starting point for future research to determine whether existing classroom practices can be disrupted or enhanced through the benefits described.

In Chapter 9 the research questions that shaped this enquiry are revisited, considering the various data collected and what they have revealed about student and teacher agency, and the metacognitive awareness in students of additional languages. The place of the proposed frameworks is linked to their potential influence on further study in this field and how, moving forward, teachers can use them to incorporate more explicit attention on the importance of metacognitive strategies when their students use learning technologies for additional language learning.

Chapter 9 – Conclusion

"Technology is not just a tool; it has an impact on the types of learning outcomes we can anticipate; it affects what types of learning we can engage in; and it inspires new developments in understanding how we learn."

(Howell & McMaster, 2022, p. 39)

Contextualised in an additional language education environment, this research explored the convergence of and interaction between student and teacher use of learning technologies, and the resultant impact on student metacognitive awareness. Student and teacher decision-making and agency, perceptions of the influence of learning technologies on student outcomes, behaviours, and the student needs identified in the study prompted the creation of two original frameworks for teachers to use with students to guide their use of learning technologies, with an emphasis on thinking processes. These frameworks champion the need for the purposeful incorporation of cognitive and metacognitive strategies into additional languages education when using learning technologies, and the explicit naming and discussion of these strategies to maximise student awareness of such concepts and learning behaviours. As identified by McWilliam (2009), there is enormous pedagogical potential in the form of digital resources, but simply adding them into a classroom will not result in digitally capable learners who have the skills necessary to navigate the future.

Howell and McMaster (2022, p. 39) state that, "technology is not just a tool", but rather, it impacts anticipatory learning outcomes, affects the range and type of learning that is possible, and can shape new ways of understanding how learning

occurs. With the appropriate selection, guidance, and scaffolding, learning technologies can also support the development, and refinement of the cognitive and metacognitive skills that are essential for learning *why* we learn in particular ways within curriculum areas such as additional language education. The frameworks presented in Chapter 8 are unique, and original, as they require teachers and students to link their learning technology use to thinking processes as well as to curriculum requirements. These frameworks aim to assist teachers in the creation and delivery of appropriate and pedagogically-sound methodologies for contemporary language learning, and to assist their students to connect what they are doing digitally, with its relevance to their learning. They also have the potential to do the same across all learning areas, inspiring students to take ownership of how they learn, and better understanding the role of learning technologies in these processes.

A mixed-method approach, specifically an explanatory sequential two-phase design (Creswell & Creswell, 2018; Dawadi et al., 2021), was used to investigate the overarching research question:

To what extent is learning technology use in additional languages education

impacting the agency of students and their teachers and impacting student

metacognitive awareness of language-learning processes?

As observed in Chapter 1, to support this investigation, the following five research questions were used to guide the inquiry:

1. How do secondary school students of additional languages perceive learning technologies to influence their learning, engagement, and agency?

2. How do secondary school teachers of additional languages perceive the influence of learning technologies on their pedagogical practices?

3. How does learning technology interaction impact students' learning and their perceived educational achievement when studying additional languages?

4. How do teachers and students make decisions about their use of learning technologies for the teaching and learning of additional languages?

5. To what extent do agency and learning technologies influence students' metacognitive awareness of language learning processes?

Given the prominent positioning of learning technologies in contemporary education, answers to these questions can improve learning experiences for students in additional languages classrooms in subtle or transformative ways. For the modern language teacher, understanding the educational possibilities that existing and emerging learning technologies provide users to engage in additional language learning programs, or any curriculum area, is fundamental for maintaining and developing pedagogical and curriculum currency and achieving successful student educational outcomes. So, too, is adopting, adapting, revising, and updating digital pedagogical approaches to teaching and learning as they are essential in fostering student engagement in these processes.

The conclusions drawn from this research (elaborated in Chapter 7), and the application of the proposed frameworks (detailed in Chapter 8), are transferable across curriculum areas. Irrespective of whether learning technologies are used, as Martin (2013) observes, the nourishment and development of student autonomy,

curiosity, reflective practices, and academic resilience or buoyancy are essential for developing impactful cognitive and metacognitive skills and awareness. It is crucial, however, that when learning technologies are integrated into teaching and learning activities, they are used judiciously and explicitly to link operational activities with cognitive and metacognitive approaches to the work. Subsequent and regular evaluation of these approaches is also essential for assessing their influence on teaching and learning experiences and student academic and participatory outcomes.

Addressing the overarching research question in this study is complicated, due to the variables that exist in contemporary additional languages education classrooms. Considering all data collected, the impact of learning technologies on student and teacher agency, as well as student metacognitive processes can potentially be significant if the pedagogical approach and learning technologies are duly considered, and geared towards open, student-centred activities that empower students to actively participate in their learning and critique the role of learning technologies within their experience. Conversely, if the pedagogical approach is more teacher-centred and the use of technology lacks relevance and explanation, opportunities for learning technologies to be linked to cognitive and metacognitive processes will be lost, and their use will not necessarily impact students' agency or awareness of thinking processes. Other considerations include the role of the teacher and their willingness to integrate learning technologies thoughtfully and purposefully into their classroom practice (Antoniou & Papadima-Sophocleous, 2022), the overall classroom environment, the rapport the students have with their teacher, whether students are motivated by technology use and what learning technologies they have access to, and, finally, the training and support offered to students and teachers to continually

upskill their capabilities relating to technology use in teaching and learning (Howell & McMaster, 2022).

Addressing the first research question, this study indicated that students perceive that learning technologies influence their learning, agency, and engagement, and they acknowledged that learning technologies can and do distract them. Students require professionally nuanced, explicit teacher instruction and roaming supervision to minimise distraction and maximise engagement while using learning technologies for additional languages education. To achieve this, teachers require well-informed and carefully considered decisions around the activities they plan for their lessons and the role technology will play within these. This may mean that, despite learning technologies being available and accessible, they may not be at the centre of every learning activity planned – carefully designed and balanced engagement with learning technologies is crucial in developing student awareness regarding when and how learning technologies should be involved in their schooling.

This research confirmed that learning technologies influence teachers' pedagogical practices (Research Question 2) and students' learning and achievement (Research Question 3). While, at times, this presents challenges to established professional ways of working, teachers did not perceive this negatively. Based on the data obtained in this study, best practice when teaching additional languages with learning technologies involved the purposeful use of technology, often by incorporating both manual and technology-based activities, with explicit, timely instructions for students, roaming supervision, and student-teacher interaction throughout the lesson. This conclusion supports Zierer's (2019) view that the purpose

of learning technologies, or digitisation, should "consist in facilitating interactions between people and exerting a positive influence on teaching and learning processes" (p. 71). Further, if the learning technologies take away the challenge of learning, or influence activities in ways that separate people, such as by typing individually when a conversation could occur, then the technology is not being used purposefully. As observed in the study, where interactions between people maintained the focus of the lesson, or the purpose of the task, the potential for distraction, and the level of actual distraction or misuse of technology reduced.

Pedagogy is so important, and teachers demonstrated ability in using learning technologies to pedagogically enrich their students' learning experiences and to cater to their varied student interests and educational needs. Their inclusion of learning technologies showed professional agility, reflecting their teaching styles, the ages and proficiency levels of the students they taught, and their continued willingness to seek out 'best' and 'next' practices related to teaching additional languages. Learning technologies were not blindly adopted but carefully scrutinised to determine their benefits and drawbacks, and then purposefully integrated into lessons with significant effect. The speed at which learning technologies change, however, requires schools and their teachers to be regularly upskilled, and supported to evolve their practice in ways that best use the available learning technologies.

To address Research Question 4, student and teacher decision-making was examined, and within this, the impact of digitally obtained feedback was included as it is often this feedback that will lead to a decision to work or behave in a particular way. Students and teachers were confident in making decisions about using learning

technologies and linked successful student language learning to accessing these. However, when this access was disrupted through a lack of connectivity or due to removing a device or program (deliberate or not), student engagement and efficiency with learning experiences were likely to decline.

Students enjoyed and engaged with learning programs that automate feedback, which impacted their decision-making. Yet they found the generated feedback vague and unhelpful regarding what they needed to do to improve, which impacted the clarity and quality of the decisions they made about how they studied. Students indicated that, as also detailed by Ryan et al. (2019), their preference was for teacher-generated feedback, on paper or via digital platforms, due to the ability of the teacher to personalise the feedback to their individual needs. This feedback could be presented in any way that helped students to determine areas of strength and weakness. Students believed that detailed and contextualised feedback guided them more effectively in determining the next steps for their learning and assisted them in their decision-making related to their academic approaches and revision. It is, therefore, prudent that teachers do not rely solely on automated programs for feedback-giving and regularly check in with their students to ensure that feedback is contextualised appropriately and understood, potentially being clarified, and personalised by the teacher if necessary.

The data collected to answer Research Question 5 was revealing as it highlighted discrepancies in terms of how metacognitive (and cognitive) strategies are taught, incorporated into teaching and learning activities, and recognised by students and their teachers when using technologies. Being metacognitively aware when using

learning technologies – that is, monitoring and purposefully directing their learning behaviours based on self-collected evidence (Quigley et al., 2021) – remains an area in which students and teachers require greater assistance. Students demonstrated some knowledge of cognitive strategies, both with and without learning technologies. These included planning their study, writing down what they could remember, using handwriting or pictures and diagrams to commit vocabulary to memory, practising in ways that replicate assessment conditions when studying, or mixing up the topics to challenge their content retention and recall. They also demonstrated that they used and enjoyed interacting with learning technologies while doing these things.

Despite this, student use of learning technologies was generally passive or even robotic, and the cognitive strategies built into many of the programs they used for language learning were automated and went unnoticed by them. Due to this automation, students were denied opportunities to make conscious decisions about how they engaged with their work or reflected upon their progress to readjust their approaches. Students did not refer to cognitive strategies by name, indicating that while they possessed and conveyed a sense of strategy about their approaches to learning, their strategies related more to what they were learning (content) rather than promoting self-reflective, self-regulative and self-directed behaviours, channelling metacognitive skills. The language students' approach to learning therefore, could be understood as instrumentalist, and was similar to that of the accounting students who featured in the work of Miller (2021) and who "focused on identifying the most efficient and effective ways of achieving…without necessarily considering the benefits of developing deeper learning skills"(p. 44). Through their responses and behaviours, the language students indicated that in their pursuit of

academic results, the accumulation of content drives them, and they appeared less interested in or even ignorant of knowing and working in the most efficient ways to achieve this. This research finding was a primary motivator for the creation of the *Digital Engagement and Metacognitive Awareness (DEMA)*, and the *What's the Point? (POINT) Framework*s, combining learning technology use and metacognitive strategy, prompting students and their teachers to give them complementary and necessary attention.

Teachers, too, showed an awareness of cognitive and metacognitive strategies when using learning technologies and demonstrated that they use these with their students. They did not, however, *explicitly* refer to these in their professional practice and, as such, missed valuable opportunities to engage in skill-creating conversations with their students. This may be an individual or professional decision; however, it may also be a pedagogical aspect that teachers still need to consider.

In existing digital pedagogical frameworks such as TPACK and SAMR, explicit references to cognitive and metacognitive skills and strategies are lacking, even nonexistent. They were not however designed with these in mind. The proposed frameworks detailed in Chapter 8 support teachers to integrate specific cognitive and metacognitive skills into digital teaching and learning activities, contextualising them, and enabling discussions around the transferability of these skills. Constructing opportunities for students to engage in metacognitive processes when using learning technologies may be initially strange for teachers and feel like additional work. However, a shared, teacher-student approach to learning about the functionality of

learning technologies, particularly given their inevitable evolution, will model for students the importance of knowing *how* they work, *why* they are relevant, and with ownership over how students use them for learning, can be beneficial and supportive tools.

The proposed original frameworks for digital engagement embed explicit instruction of cognitive and metacognitive strategies into teaching and learning programs and linked them to curriculum and assessment activities using learning technologies. As this research produced evidence that students 'do' but do not necessarily 'engage' when working digitally, careful consideration is required when planning teaching and learning activities using learning technologies. It is essential that teachers do not assume that digital skillsets exist and that the skills needed for each application or program are audited at the beginning (or prior to) of a teaching cycle and taught specifically or revised. Each learning technology requires exploration, signposting in the curriculum plan, and alignment to the task, building in time for digital skill development or refinement if necessary.

The insights provided by this research also revealed areas that warrant further investigation, such as whether distraction or misuse are age- or gender-related, the quality and educative value of digital resources, and the efficacy of the original frameworks when used *en masse* across varying curriculum areas. There are conceptual and methodological limitations to this research and given the nature and size of the sample used, it is important not to prematurely generalise the findings. However, the outcomes and recommendations of this research remain valuable and are indicative of what may be seen should a greater body of work be undertaken, and

more substantial data collected. In particular, the relevance of connecting learning technology use and cognitive and metacognitive processes warrants further investigation as it remains under-represented in academic literature and is, therefore, likely under-represented in schools and in their teaching and learning programs.

Finally, the concept of 'effective' learning technology use ought to be revisited, as through policy and in schools, teachers are asked to use technologies 'effectively' but with little guidance on how and what that looks like. Frameworks for technology integration such as SAMR (Tunjera & Chigona, 2020) and TPACK (Adipat, 2021; Zeng, 2022) assist teachers in using technologies for the enhancement of engagement, learning, and achievement; however, for some teachers, especially those more experienced, the concept of digital pedagogies are relatively new, dynamic, and potentially uncomfortable and threatening. For learning technologies to be effective, they must aid the user, be they student or teacher, to create or assist in the successful completion of the desired learning outcome, and their use in these processes may be significant or subtle. If teachers and students are not fully aware of the functionality or the capability of the learning technologies they are using or have access to and have little understanding of digital pedagogical frameworks when using these, the options to involve learning technologies in teaching and learning activities could be significantly more or less complex than they realise. Consistent with the OECD (2023) report *Shaping digital education: Enabling factors for quality, equity and* efficiency, this research highlights the significance of regularly reviewing learning technologies within the context of 'best fit for learning'. Staff must be regularly and appropriately upskilled in their use to assist their professional organisation and efficiency, but also

trained and developed in the application of learning technologies to support and enhance their digital pedagogical approaches.

Realising and working within the limitations of learning technologies, particularly as they relate to the lack of inclusion of cognitive and metacognitive strategies, teachers can assert themselves as the "essential factor for the successful integration of technology in educational settings" (Howell & McMaster, 2022, p. 31) and support their students to not only engage with learning technologies but to understand their purpose and functionality in educational programs. By overlaying the concurrent development of cognitive and metacognitive skills needed for learning with and without technologies, teachers can equip their students with a contemporary repertoire of strategies that will set them up for success in their learning across all curriculum areas and for life beyond the classroom.

Finally, this research has impacted me professionally as an educator, and personally, as a parent. It has further steeled my resolve to emphasise to educational communities the importance of working with our young people to see the operational aspects of the learning technologies they engage with, and to know *how* and *why* these can assist or hinder student learning. While, on this occasion, this research occurred within the additional languages education space, I believe its application lies well beyond language education and is truly transferrable across curriculum areas and into adult life. Interacting with and being open to the possibilities of technologies does not end upon the completion of compulsory education, as technologies now permeate almost every aspect of adult life. It is imperative that as educators, parents, and community members, we learn alongside

our children and model practical, intelligent, interactive, and reflective strategies that evolve over time. Despite learning technologies and metacognition being relatively separate in our current ways of working, I wholeheartedly believe that the explicit integration of the two areas will equip our students and their educators with skills that will carry them robustly into the future of education.

Appendix

Appendix 1: Online Survey Questions for Students

Q1

The name of my school is...

[   ]

Q2

My student ID number is (so we can ask you more questions if we need further information)...

[   ]

Q3

I am...

○ 11 years old
○ 12 years old
○ 13 years old
○ 14 years old
○ 15 years old
○ 16 years old
○ 17 years old

Q4

I identify as...

○ Boy
○ Girl
○ Prefer not to say
○ Other

Q5

My year level is...

○ Year 7

○ Year 10

Q6

I want to study at University or TAFE in the future.

○ Yes

○ Maybe

○ No

Q37

I am a boarder at my school (living at school during the school term)...

○ Yes

○ No

Q5

My year level is...

○ Year 7

○ Year 10

Q6

I want to study at University or TAFE in the future.

○ Yes

○ Maybe

○ No

Q7

I am learning... (select all that apply)

○ Chinese

○ French

○ German

○ Italian

○ Japanese

○ Spanish

○ Other
[   ]

Q8   ·҉·

I enjoy learning this/these language/s...

Q9

Why or why not? Please explain your response to the above question in your own words.

[ ]

Q14

I have been learning this/these language/s for...

	0	1	2	3	4	5	6	7	8	9	10	11	12
Years													
Months													

Q15

The language I am learning is easy.

Q16

Why or why not? Please explain your response to the above in your own words.

[ ]

Q17

In my school, the use of digital technologies such as iPads, tablets or laptops is...

○ compulsory (I must use it)

○ optional (I can use it if I want to)

Q18

In my language-learning classroom, the following digital technologies are used (mark all that apply)

- [ ] Smartphone
- [ ] iPad/tablet
- [ ] laptop
- [ ] interactive whiteboard
- [ ] smart projector
- [ ] other

Q19

I rate my expertise in ***using digital technologies for learning languages*** as...

- ○ Expert
- ○ Advanced
- ○ Intermediate
- ○ Beginner
- ○ Have not used

Q20

I rate my ***academic performance*** with regard to additional language learning as...

- ○ Excellent
- ○ Good
- ○ Average
- ○ Below average
- ○ Poor

Q17

My ***knowledge*** of additional languages is largely based on my digital technology use.

- ○ Very true - I learn constantly on my device
- ○ True - I learn a lot of the time on my device
- ○ Neutral - I learn some of the time on my device
- ○ Somewhat untrue - I learn occasionally on my device
- ○ Untrue - I don't use my device to learn

Q18

My academic *__performance__* (grades) in additional languages is because I use digital technologies.

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Disagree

○ Strongly disagree

Q19

I use digital technologies to engage with additional language learning activities that I find myself.

○ Constantly

○ Yes, very often

○ Yes, often

○ Sometimes

○ No

Q20

Is yes, can you provide an example/s of this?

☐ Language learning game/program/website

☐ target language television and/or movies

☐ grammatical explanations (video)

☐ grammatical explanations (text based)

☐ discussion forums in the target language

☐ social media interaction with people using target language (e.g. Facebook, Twitter, Instagram, WhatsApp etc.)

☐ email

☐ web-based video interaction with friends using target language

☐ gaming in target language

☐ other

Q21

I frequently self-test my language learning using the 'testing' features of the web-based programs/applications to check my progress.

○ Yes - more than once a week

○ Yes - once a week

○ Yes - 2 to 3 times a term

○ Not really - once a term

○ No - rarely or never

Q22

If yes, choose the response that most closely matches your reason why...

○ I should revise my vocabulary regularly

○ It helps me to cram just before assessment

○ I forget vocabulary if I don't test myself regularly

○ I do because I know my teacher and parents are judging me on how regularly I revise

○ It helps me work out how much I know and what I have to work on

○ Other

[   ]

Q23

Using digital-technologies makes me want to continue learning additional languages.

Q24

How do you feel when you do not have access to digital-technologies to assist you with learning your additional language/s? Please explain.

[   ]

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Q25

Digital-technologies are very supportive resources (tools) when learning languages.

Q26

I become very distracted when using technology for additional language learning.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q28

Despite having digital technologies available to me for learning languages, I prefer to use more traditional methods such as pen/paper or flash cards.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q33

Using digital-technologies for language learning helps me to understand _**how**_ to learn languages as well as learning vocabulary and grammatical content.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q34

Can you explain why you chose your response to the above question and provide an example?

Q35

The feedback I receive in online learning programs or applications is helpful to my learning.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q36

Please explain your response for the above question.

Q27

[For Year 10 Students] Has the way you use digital technologies for language learning changed over the last 3-4 years? Why or why not? Please explain.

Q29

[For Year 10 Students] Tell us about how you learnt languages during the lockdown period of COVID-19 (April-May 2020).

Q30

[For Year 10 Students] During the COVID-19 Lockdown, my _**engagement**_ with language learning...

○ Declined dramatically

○ Declined

○ Stayed the same

○ Increased

○ Increased dramatically

Q31

[For Year 10 Students] During the COVID-19 Lockdown, digital learning-technologies had a huge impact on my engagement with the subject.

○ Very true - increased dramatically

○ True - increased

○ Neutral - stayed the same

○ Somewhat untrue - declined

○ Untrue - declined dramatically

Q32

[For Year 10 Students] Please explain your response to the above question.

Appendix 2: Online Survey Questions for Teachers

Q1

The name of my school is...

Q2

My initials are (so we can ask you more questions if we need further information)...

Q3

I have been teaching for...

○ 5 or fewer years

○ between 5 and 10 years

○ between 10 and 15 years

○ between 15 and 20 years

○ between 25 and 30 years

○ more than 30 years

Q4

I identify as...

○ Male

○ Female

○ Prefer not to say

○ Other

Q7

I am teaching these languages (select all that apply)

○ Chinese

○ French

○ German

○ Italian

○ Japanese

○ Spanish

○ Other

Q14

I have been teaching this/these language/s for...

Number of years

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40

Years

Q8

I enjoy teaching this/these language/s...

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree
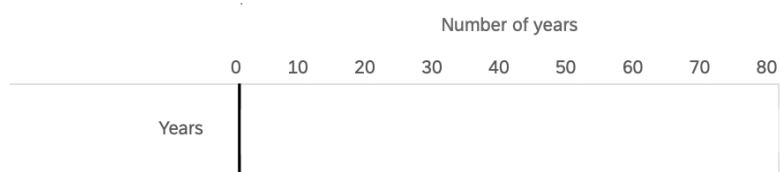
○ Somewhat disagree

○ Strongly disagree

Q9

Why or why not? Please *explain* your response to the above question in your own words.

Q15

I have been a learner of this/these languages for...

Number of years

| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |

Years

Q16

In my school this/these languages are...

○ compulsory for students

○ an elective subject for students

○ a combination of compulsory and elective

Q39

If compulsory, at what point in secondary school does the language become an elective subject?

○ Year 7

○ Year 8

○ Year 9

○ Year 10

○ Years 11-12

Q17

In my school, the use of digital technologies such as iPads, tablets or laptops is...

○ compulsory for students

○ optional for students

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Q18

In my language-learning classroom, the following digital technologies are used (mark all that apply)

☐ Smartphone

☐ iPad/tablet

☐ laptop

☐ interactive whiteboard

☐ smart projector

☐ other

[   ]

Q19

I am confident in my ability to use _**digital technologies for teaching languages.**_

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q20

I rate my _**confidence**_ with regard to additional language teaching as...

○ Very high

○ High

○ Average

○ Below average

○ Poor

Q17

My students' _**knowledge**_ of additional languages is largely based on their digital technology use.

○ Very true - they learn constantly on their device

○ True - they learn a lot of the time on their device

○ Neutral - they learn some of the time on their device

○ Somewhat untrue - they learn occasionally on their device

○ Untrue - they don't use their device to learn

Q18

My students' academic ***performance*** (grades) in additional languages is largely due to their use of digital technologies.

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Q19

I use digital technologies to find language learning activities and/or explanations that I supplement my lessons with.

- ○ Constantly
- ○ Yes, very often
- ○ Yes, often
- ○ Sometimes
- ○ No

Q20

If yes, can you provide an example/s of this? (mark all that apply)

- ☐ Language learning game/program/website
- ☐ target language television and/or movies
- ☐ grammatical explanations (video)
- ☐ grammatical explanations (text based)
- ☐ discussion forums in the target language
- ☐ social media interaction with people using target language (e.g. Facebook, Twitter, Instagram, WhatsApp etc.)
- ☐ email
- ☐ web-based video interaction with friends using target language
- ☐ gaming in target language
- ☐ other

Q21

I frequently test my students' language learning using the 'testing' features of the web-based programs/applications to check their progress.

○ Yes - I frequently test them digitally

○ Yes - I often test them digitally

○ Yes - I sometimes test them digitally

○ Not really - I occasionally test them digitally

○ No - I rarely test them digitally

Q22

If yes, choose the response that most closely matches your reason why...

○ they should revise their vocabulary regularly

○ It helps them to revise just before assessment

○ They forget vocabulary if they don't test themselves regularly

○ My students and their parents are judging me on how regularly we revise

○ It helps me work out how much they know and what they have to work on

○ Other

Q23

Using digital-technologies makes me want to continue teaching additional languages.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q24

How do you _feel_ when you do not have access to digital-technologies to assist you with teaching additional language/s? Please explain.

Q28

Despite having digital technologies available to me for teaching languages, I prefer my students to use more traditional methods such as pen/paper/whiteboard or flash cards.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q25

Digital-technologies are very supportive resources (tools) when learning languages.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q26

My students become very distracted when using technology for additional language learning.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q40

Has the way your senior language students engage with digital technologies for language learning changed over the last 3-4 years? Why or why not? Please explain.

Q28

Despite having digital technologies available to me for teaching languages, I prefer my students to use more traditional methods such as pen/paper/whiteboard or flash cards.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q41

Please *explain* your reasoning for the above question.

Q42

Please *describe* your language teaching experience during the lockdown period of COVID-19 (April-May 2020)?

Q43

During the COVID-19 Lockdown in 2020, my students' (general) *engagement* with language learning...

○ Increased dramatically

○ Increased

○ Stayed more or less the same

○ Declined

○ Declined dramatically

Q44

During the COVID-19 Lockdown, l*earning technologies* had a huge impact on my students' *engagement* with their additional language learning.

○ Very true - increased dramatically

○ True - increased

○ Stayed more or less the same

○ Untrue - declined

○ Very untrue - declined dramatically

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Q45

Please _**explain**_ your response to the above question.

[   ]

Q33

Using digital-technologies for language learning helps my students to understand _**how**_ to learn languages as well as learning vocabulary and grammatical content.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Q34

Can you _**explain why**_ you chose your response to the above question and provide an example?

[   ]

Q46

I believe that, despite the amount of digital technologies available for language teaching, I have _**professional autonomy**_ to utilise the resources in the way I believe best suits my students' needs.

○ Strongly agree

○ Somewhat agree

○ Neither agree nor disagree

○ Somewhat disagree

○ Strongly disagree

Appendix 3: Observation Protocol

CLASSROOM OBSERVATION – LEARNING TECHNOLOGIES USE IN ADDITIONAL LANGUAGES EDUCATION

RESEARCHER: ASHLEE BRUCE (CURTIN UNIVERSITY)

School ID: 1 / 2 Student Initials: (removed at time of write-up, for identification only) Date of observation: SUBJECT: YEAR LEVEL: 8/11 (will be one year higher due to delay in observations – COVID19) * only student/teacher who provided consent will be observed, not whole class								
TEACHER				**STUDENT** (Grouping: ☐ whole class/☐ large group/☐ small group/☐ pair/☐ individual)				
Learning Technologies Used - Devices:	☐ Computer (mobile device)	☐ Computer (desk top)	☐ Tablet/iPad	☐ Data Projector → **Learning Technologies Used - Devices:**	☐ Computer (mobile device)	☐ Computer (desk top)	☐ Tablet/iPad	☐ Data Projector
	☐ Interactive Whiteboard/Smart board	☐ Mobile Phone	☐ Other (provide details):		☐ Interactive Whiteboard/Smart board	☐ Mobile Phone	☐ Other (provide details):	
Learning Technologies Used – Programs/Applications (list all used):				**Learning Technologies Used – Programs/Applications (list all used):**				
Other materials used by teacher:	☐ Whiteboard	☐ Whiteboard markers	☐ Photocopies	☐ Textbooks → **Other materials used by student:**	☐ Whiteboard	☐ Whiteboard markers	☐ Photocopies	☐ Textbooks
	☐ Props	☐ Other (provide details):			☐ Props	☐ Exercise book	☐ Other (provide details):	
Instructor Behaviour:	☐ Direct instruction	☐ Modelling and/or demonstrating	☐ Scaffolding	☐ Leading discussion → **Student Behaviour (general):**	☐ Listening to/watching direct instruction	☐ Note-taking manually/electronically	☐ Completing classroom activity as instructed	☐ Other activity (not instructed)
	☐ Listening/watching	☐ Talking to individuals and/or groups	☐ Other (provide details)		☐ Off-task/other (provide details)			
Class Activities:	☐ Listening/Notetaking	☐ Question/Response	☐ Discussion	☐ Independent work	☐ Research or project work	☐ Experimental, hands-on learning	☐ Analysis and/ or translation	☐ Presenting	☐ Reflecting on

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							ideas/opini ons	knowled ge
	☐ Participating in group activities	☐ Assessment	☐ Other (provide details)					
Technology used:	☐ for presentation	☐ for communication	☐ for data collection/anal ysis	☐ for content exploration/reinforce ment	☐ for skill/building/plan ning	☐ for skill development (learning how to use)	☐ Other (provide details):	
Provide details of how technology/ies were used by both teacher and students:								
General notes on other observations on teacher/student behaviour and/or interaction with technology/ies for Language teaching/learning	Any indication of student being distracted by technology? Y/N (and provide details where applicable) General notes (continued).							

Appendix 4: Semi-Structured Interview Questions – Students

1. In the questionnaire, there was a range of student responses to the statement "I enjoy learning this/these languages/s." Are there a couple of people who could reflect on their own response, and elaborate on this more for me so I can understand your perspective? (Survey Q8-9)

2. There was also a variety of responses when I asked whether students believed their academic performance in learning languages was related to their use of digital technologies. Why do you think student responses would vary? (Survey Q20)

3. Some students indicated that their knowledge of additional languages is largely due to using digital technologies. Why do you think this might be? (Survey Q17)

4. In the survey, some students indicated that using digital technologies for learning languages really makes them want to continue their study. Why do you think they would have responded in this way? (Survey Q23)

5. Many students indicated that they think digital technologies are very supportive resources when learning languages. Do you agree, and could you explain to me why or why not? (Survey Q25)

6. There was a lot of variation in student responses when I asked whether or not they become very distracted when using technology for additional language learning. Why do you think technologies distract some students and not others? (Survey Q26)

7. Some students indicated that they study languages quite traditionally, even when there are digital options available. I would love more insight into why you think this might be. Would you like to add any more information to this now that we are able to discuss it in a group? (Survey Q28)

8. [FOR YEAR 10 STUDENTS] Some of the Year 10 students indicated that their use of digital technologies for language learning has changed over the last 3-4 years. That is really interesting to me and I would love more details. Could you please give me some more information on this now that we are able to discuss it? (Survey Q27)

9. Please think back to times when you have had to learn at home during what we now call 'Lockdowns', which are due to the spread of COVID-19. Some students indicated that their engagement with learning languages during that time changed. Why do you think that was? If anyone in this group would like to provide more information, that would be wonderful. (Survey Q29, Q30-32)

10. In the survey, I asked you whether "using digital technologies for language learning helps me (you) to understand HOW to learn languages as well as learning vocabulary and grammatical content." What do you think I mean when I ask you if the technology helps you to understand **how** you learn? (Survey Q33-34)

11. Do you think there is a difference between knowing what to improve, as opposed to knowing how to improve when you study additional languages? Do you and your teachers use technologies in a way that helps you to distinguish these things? (elaboration of Survey Q33)

12. In the student responses, the statement "the feedback I receive in online learning programs or applications is helpful to my learning", I saw responses vary from 'strongly disagree' through to 'strongly agree.' Is anyone able to give me some more information about why they

think there is such a variety in responses, and perhaps reflect on their own experiences? (Survey Q35-36)

   a.   [possible support questions] If you were to receive helpful feedback via digital technologies what would that feedback look like to you?
   b.   Can you provide me with some examples of what kind of feedback is helpful?
   c.   Can you make some suggestions about what teachers or programs could do to make feedback more helpful? (elaboration of Survey Q35)

13. Is there anything else you would like to comment on about using digital technologies in your additional language class?
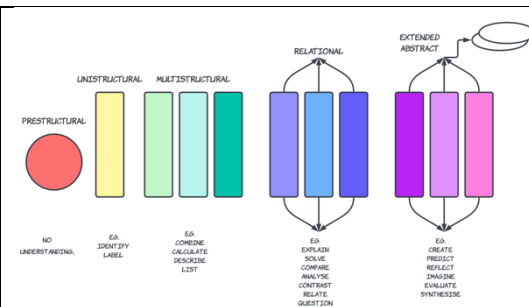
Appendix 5: Semi-Structured Interview Questions – Teachers

1. In the questionnaire, you identified that you all really enjoy languages and that the link between language and culture was a key reason. Are you able to tell me any more about why you feel this way? (Survey Q8-9)

2. There was a range of responses when I asked whether you believe your students' academic performance in learning languages was because of their use of digital technologies. Would someone be prepared to elaborate on this more? (Survey Q18)

3. You all indicated that your students' knowledge of additional languages in some cases is largely due to using digital technologies. Why do you think this might be? (Survey Q17)

4. You indicated that you think digital technologies are supportive resources when learning languages. Can you please explain your point of view to me with some more details? What makes them supportive? (Survey Q25)

5. You suggested in your questionnaire response that some students become very distracted when using technology for additional language learning and others not so much. Can you please explain why you think that is the case? Why do you think they distract some students and not others? (Survey Q26)

6. In your response to how, despite having digital options available, you still use more traditional methods frequently for languages teaching was really interesting. Could you provide me with any more details about this? (Survey Q28 and Q41)

7. Your responses to how your students' use of digital technologies for language learning has changed over the last 3-4 years was really interesting to me. Could you please give me some more information about this? (Survey Q40)

8. Please think back to when you had to teach your students while they were at home during what was called the 'COVID Crisis'. Some of you indicated that students' engagement with learning languages during that time changed. Could you please tell me more about why you think this? (Survey Q42-45)

9. Do you think that learning languages with digital technologies helps students to understand how they learn languages as well as helping them to learn linguistic content? (Are you able to explain what you mean by the technology helping them to understand how they learn? (Survey Q33-34)

10. Do you think that the inclusion of digital technologies in additional language learning programs (and by that I mean the expected use of hardware and prescribed programs, as well as those programs you choose to incorporate) has an impact on your professional autonomy to determine the best way to teach languages? Could you explain your response? (Survey Q46)

11. You have indicated that the feedback your students receive through the digital language-learning programs is sometimes helpful and sometimes not so helpful with regard to their learning. Are you able to give me some more information about why you feel this way? (Survey Q35-36)

12. What do you think needs to happen to make digital learning programs more effective? (Elaboration of Q35-36)

13. One of you commented that there is a need for teachers to adapt to technology as it advances. Would one or more of you be able to comment on how you feel with regard to 'keeping up' with changing learning technologies used to teach additional languages?

14. Is there anything else you would like to comment on about using digital technologies in additional languages teaching and learning?

Appendix 6: DEMA Example

Syllabus	General Japanese (QCAA)	
Assessment	Internal Assessment 3 (IA3) (Multi-Modal Response)	
Task Description	Multimodal presentation – 3-8 minutes Task: In this unit, you have focussed on the topics of city life and country life. Your response will be to two (2) teacher-provided stimulus texts, one (1) of which will be explored in class. The other one (1) you will work on individually. **Situation:** You have been exploring the differences between city life and country life, both in Japan and in Australia. Our visiting Japanese group from Tomita High School would like to hear about your opinions. **Task:** Analyse Stimulus 1 and 2 to develop a multimodal presentation where you establish a personal perspective in response to the following question: **How does the information presented in the stimulus texts compare to your preferences and interests in regard to your ideal place of residence.** *(You might wish to consider how your likes, dislikes, talents, lifestyle preferences and aspirations contribute to your preferences of living in the city or the country)*	
Pedagogical Framework	SOLO Taxonomy	

	SOLO Phase	Orientate Understand use of tech and reason for tech selection	Relate Determine steps to use tech effectively and relate to needs of the task.	Create Combine technology use with content to complete the task	Evaluate Reflect on usefulness of tech in achieving task/goal	Innovate, Apply, Transfer Thinking Apply resource/task or innovate to improve and begin cycle again.	Questions/Assumptions
	Prestructural Unistructural Multistructural Relational Extended Abstract						
Notability	Prestructural Unistructural Multistructural Relational Extended Abstract	Engaging with task sheet and stimulus texts, digital record of progress.	Students to use program during annotating of stimulus and feedback processes.	Can use to plan response.	Enables multiple copies of same document Can annotate questions, take screenshots and upload as record of progress. Alternative- could be handwritten.	Can use with documents in other learning areas.	Students can download/open document in Notability. Can work iPencil to highlight text/make notes or type.
Showbie	Prestructural Unistructural Multistructural Relational Extended Abstract	Communication platform between student and teacher. Students upload progress each lesson for record and authentication. Platform for teacher feedback.	Teacher can view progress, ask /answer questions and record of progress developed for authentication of work (originality).	Students upload progress each lesson – photos/screenshots of work and of audio recording prior to submission.	Easy communication between student and teacher. Running record of progress. Feedback/feedforward platform.	Program used across other learning areas. Works as record of progress if student is away – is work to submit if final copy impossible, and able to be authenticated.	Do students fully understand why they must upload work examples each lesson? Must remind them at end of each lesson to do so (to ensure it occurs).
Digital Dictionary	Prestructural Unistructural Multistructural Relational Extended Abstract	Used to decode language – both in stimulus phase and in creation phase. More reliable than translating programs.	Remind students about how to use – determining parts of speech, verb conjugations, assuming first entry is correct. Can look up unfamiliar Asian characters.	Students to use dictionary before asking teacher. When in use, teacher to ask student questions to determine the correct word/phrase. Can be modelled throughout lessons (ongoing).	Dictionary is helpful if used correctly and responsibly. Teacher to model what correct/responsible use looks like. Alternative- Hardcopy dictionary.	Could compare with dictionary use in first language – how is a 'correct' response determined? What information is needed from dictionary to determine appropriateness?	Students can type in Japanese. Students know how to use digital dictionary. Can the students search using Japanese and interpret results? (Likely to need assistance)
Inspiration Maps	Prestructural Unistructural Multistructural Relational Extended Abstract	Used to determine key themes in stimulus texts, and to make connections between them and student perspectives.	As engaging with stimulus, students to represent key themes/vocabulary/values on map. Can embellish with related words/images.	Criteria expects analysis and synthesis of ideas. As connections made, represent on inspiration map to determine what to emphasise in response.	Can 'see' links between themes and students own perspectives/values. May make selection of focal points in presentation more obvious due to amount of information represented. Alternative- could be handwritten.	Inspiration Maps can be used across other subjects. Techniques learnt in these can also be used to complete language tasks.	Can they use Inspiration Maps to create a mind map using words and images? (Yes, in other subjects, but modelling is needed for Japanese). Typing in Japanese.
PowerPoint	Prestructural Unistructural Multistructural Relational Extended Abstract	Used to present final multimodal presentation. Can use to present visual and also record audio of script.	Will contain images and key words that audio will speak to. Presentation is a support for the recording of speech.	Script not represented on PowerPoint – only supporting images and words. Use recording tools to record speech.	Use of PowerPoint makes a multimodal presentation – visual and audio. May convey some sentiments that student can't speak to directly (due to language limits), e.g. photographs.	Used with regularity in other curriculum areas – for class and assessment work.	Assume that students do not need instruction to create PowerPoint. Assistance for voice recording as not used as frequently. Typing in Japanese.
MS Word	Prestructural Unistructural Multistructural Relational Extended Abstract	Used to record script, which is the response to the task question.	Will be used to generate a script, but the script is not marked – the AUDIO is. Important for students to understand this. As script not marked, can be typed.	Can use program throughout process, or just at end once ideas formulated.	Necessary for completion of task. Alternative- could be handwritten.	Used across curriculum areas.	Students will need to use typing skills here.

NOTES

Potentially a lot of typing – can students do this easily? Is a typing refresher required? Dictionary use important – are skills sufficient? More time required for these? Due to number of learning technologies, will need to prompt students during lesson on their use, and remind students at end of each lesson to upload evidence of what was completed. Alternatives listed for students who wish to write by hand/on hardcopy. Students unlikely to have used Inspiration Maps in Japanese before – connect to SOLO to demonstrate how ideas can be connected, not just within themes, but across themes. Providing or building time for modelling important. Typing is skill learnt in Junior Secondary – time to be prioritised for Inspiration Maps and synthesis of ideas as they relate to stimulus texts.

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