

**INVESTIGATING TESL CURRICULUM USING
TPACK FOR 21ST CENTURY LEARNING
SKILLS: A CASE STUDY IN AN INSTITUTE OF
TEACHER EDUCATION IN MALAYSIA**

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UNIVERSITI SAINS MALAYSIA

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TEACHER EDUCATION IN MALAYSIA**

by

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LIST OF ABBREVIATIONS

ASCILITE	Australasian Society for Computers in Learning in Tertiary Education
ICT	Information and Communications Technology
IR5.0	Industry 5.0
ITE	Institute of Teacher Education
LCD	Liquid Crystal Display
LMS	Learning Management System
MKO	More Knowledgeable Other
PdP	<i>Pengajaran dan Pembelajaran</i> (Teaching and Learning)
PISMP	<i>Program Ijazah Sarjana Muda Perguruan</i> (Bachelor of Teaching Programme)
SAMR	Substitution Augmentation Modification Redefinition
SPM	<i>Sijil Pelajaran Malaysia</i> (Malaysian Certificate of Education)
SSKP	Survey of Customer Satisfaction
TALIS	Teaching and Learning International Survey
TESL	Teaching English as a Second Language
TPACK	Technological Pedagogical and Content Knowledge
TPACK21cls	Technological Pedagogical Content Knowledge for 21st century learning skills
ZPD	Zone of Proximal Development

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**MENKAKAJI KURIKULUM TESL MENGGUNAKAN TPACK UNTUK
KEMAHIRAN BELAJAR ABAD KE-21: KAJIAN KES DI SEBUAH
INSTITUT PENDIDIKAN GURU DI MALAYSIA**

ABSTRAK

Pendidikan 5.0 merupakan penggunaan teknologi sebagai agen untuk menambah nilai dan meningkatkan keberkesanan untuk menambah baik pembelajaran. Namun, isu kualiti pengintegrasian teknologi yang kurang memuaskan dalam Pengajaran dan Pembelajaran (PdP) Bahasa Inggeris sebagai bahasa kedua masih berterusan. Untuk mengatasi masalah ini, kajian ini mengkaji kurikulum TESL yang dirancang, kurikulum yang disampaikan dan kurikulum yang dialami di sebuah Institut Pendidikan Guru (IPG) di Malaysia. Matlamat kajian kes ini adalah untuk mengkaji penggunaan pengetahuan Teknologi Pedagogi Isi Kandungan untuk kemahiran belajar abad ke-21 (*TPACK21cls*) dalam kurikulum dengan mengintegrasikan model SAMR untuk mengukur tahap penggunaan teknologi. Kaedah data kualitatif yang digunakan adalah analisis dokumen, temubual dan refleksi manakala analisis data adalah berdasarkan pengurangan data mengikut tema melalui proses pengekodan dan tafsiran akhir dapatan. Dapatan menunjukkan kurikulum yang dirancang mengutamakan penggunaan Pengetahuan Kandungan dan Pengetahuan Kandungan Pedagogi guru pra-perkhidmatan. *TPACK21cls* tidak dikesan dalam rasional dan hasil pembelajaran kursus. Sementara itu, dalam kurikulum yang disampaikan, peserta kajian yakin dengan Pengetahuan Teknologi tetapi pengetahuan menggunakan teknologi untuk mengajar adalah melalui pengalaman mereka sebagai pelajar. Mereka mengaplikasikan pengetahuan yang mereka pelajari semasa tugas kerja kursus dan tutorial dalam PdP semasa praktikum. Para pensyarah, walaupun imigran digital, dapat

menggubalkan tugas teknologi dalam tahap modifikasi kepada para peserta. Mereka telah memaparkan Pengetahuan Teknologi Pedagogi Isi Kandungan untuk komunikasi dan kolaborasi. Dapatan daripada kurikulum yang dialami pula menunjukkan para peserta kajian mempunyai Pengetahuan Teknologi Pedagogi Isi Kandungan untuk komunikasi sahaja dan pada tahap penggantian. Dapatan tambahan yang dilaporkan adalah menaikkan taraf infrastruktur teknologi, peningkatan kemahiran pensyarah dalam penggunaan teknologi dan penyemakan semula kurikulum pra-perkhidmatan guru. Dapatan kajian ini mempunyai implikasi untuk PdP dengan teknologi di sekolah dan IPG di Malaysia. Oleh itu, diharapkan kajian ini dapat direplikasi dalam persekitaran yang lain untuk meneliti keberkesanan model *TPACK21cls* yang telah dicadangkan dalam kajian ini. Adalah diharapkan bahawa dapatan kajian ini dapat memanfaatkan tinjauan dan rekabentuk program pendidikan guru untuk membincangkan keupayaan *TPACK21cls*.

**INVESTIGATING TESL CURRICULUM USING TPACK FOR 21ST
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ABSTRACT

Education 5.0 is about using technology as an enabler to add value and increase effectiveness to improve learning. However, the issue on the poor quality of ICT integration in the teaching of English as a second language still persists. To address this problem, this study investigated the TESL planned curriculum, delivered curriculum and experienced curriculum in an Institute of Teacher Education (ITE) in Malaysia. The main aim of this case study was to investigate the use of Technological Pedagogical Content Knowledge for 21st century learning skills (TPACK21cls) in the curriculum by integrating the SAMR model to gauge the stages of ICT use. Qualitative data methods include document analysis, interviews and reflections while data analysis was based on data reduction into themes through coding processes and final representation of findings. The findings revealed that the planned curriculum emphasised the development of pre-service teachers' Content Knowledge and Pedagogical Content Knowledge. TPACK21cls was missing in the rationales and learning outcomes of the course summaries. As for the delivered curriculum, the participants were confident with their Technological Knowledge but the knowledge to use ICT to teach in their T&L was mainly learnt by their experiences as students. They applied how they used ICT for their assignments and tutorial tasks into their T&L during practicum. Nevertheless, the lecturers, being digital immigrants, were able to plan tasks using ICT tools at modification stage. They displayed knowledge on TPACK for communication and collaboration. Meanwhile findings from the

experienced curriculum displayed the participants possessing TPACK for communication only and the stage of ICT use was at substitution stage. Additional findings reported were on upgrading ICT infrastructures, upskilling lecturers on the use of ICT and revising the pre-service curriculum. The findings of this study have implications for the teaching and learning with ICT in schools and ITEs in Malaysia. It is hoped that the study is replicated in other settings to examine the effectiveness of the TPACK21cls model as suggested in this study. It is hoped that the findings of this study would be able to inform the review and design of teacher education programs to address TPACK21cls capabilities.

CHAPTER 1

INTRODUCTION

1.1 Overview of the Study

During the phase in Industry 4.0, human involvement was minimised and automation process prioritised. However, in Industry 5.0 (IR5.0), the trend is reversed (*Industry 5.0: The New Revolution*, n.d.). The goal is to make the most out of machine-human interaction by striking a balance between machine and human (George & George, 2020). IR5.0 refers to people working alongside robots and smart machines by adding a personal human touch to the pillars of automation and efficiency in Industry 4.0 (George & George, 2020; Jardine, 2020; Larson, 2020).

For a better understanding of IR5.0, George & George (2020) identified three essential facts about IR5.0. Firstly, it is aimed at supporting, not superseding humans. Secondly, it is finding the optimal balance of efficiency and productivity. And thirdly, the progress of IR5.0 is inevitable. The use of technology is no longer to replace people; instead, it is to improve its function by refining the collaborative interactions between humans and machines. The main focus is to find ways on how best to leverage new technologies to drive optimal outcomes from human-machine interactions. In other words, IR 5.0 will bring back the human factor and it will be assisted by technologies (Salgues, 2018). IR 5.0 is a mind set (Larson, 2020). It is a step to the next level which is a cultural shift from scarcity and efficiency to resource optimization, by integrating human and machine. As change is inevitable, IR5.0 is all about taking charge of the change, making it happen, and getting ahead in the game.

As individuals, we must become smarter and faster in learning how to use technology. With the plethora of ICT tools available on the web, we must be able to optimise the use of technology. Learning is more than just formal schooling as there is an abundance of other resources on the Internet for content. In addition to that, the existence of new software and tech will help us do our job better, cheaper, and faster. Hence, we need to take the affordances to a greater value by getting more done in less time, with a larger impact (Dervojeda, 2021).

“Education is no longer just about teaching students something, but about helping them to develop a reliable compass and the tools to navigate with confidence through an increasingly complex, volatile and uncertain world. We live in this world in which the kind of things that are easy to teach and test have also become easy to digitize and automate, and where society no longer rewards students just for what they know – Google knows everything – but for what they can do with what they know. Today’s teachers need to help students think for themselves and work with others, and to develop identity, agency and purpose.”

(OECD, 2019, p.5).

“To improve learning, technological applications have to be well designed, on the basis of learning and pedagogical principles, used under appropriate conditions, and be well integrated into the school curriculum” (Bai et al., 2019; Dervojeda, 2021; Hoyles, 2018; Rana et al., 2018). Therefore, teaching in this era should be more than just substituting old technologies like the blackboard and overhead projectors, with the Liquid Crystal Display (LCD) screen or replacing brick and mortar classes with Google Meet. Teachers should go beyond possessing pedagogical knowledge, content knowledge and technological knowledge independently. To support this new paradigm

of teaching, teachers need to be competent with technology and able to effectively integrate it into their teaching and learning (Görgülü & Küçükali, 2018 as cited in Fidan et al., 2020; Instefjord and Munthe, 2017; “Editorial Committee,” 2014; Stephen & Edwards, 2018). There is a range of affordances of bringing technology into education. It starts from providing easy access to various web materials and leads on to allowing interaction which turns the learning environment from passive to active. (Kale & Akcaoglu, 2017; Petko et al., 2015).

Innovation and enhancement in digital transformation in education has been further accelerated during the COVID-19 pandemic (Kang, 2021). Online learning has unexpectedly become a necessity rather than an option (Ali, 2020; Dhawan, 2020). Its impact on instructional delivery has demonstrated the importance of effective technology integration and the potential of technology to ensure continuity of instruction for students (DaMaren et al., 2020; Keefe, 2020; Snyder, 2020; Trust & Whalen, 2020). COVID-19 is challenging inherent ideas of when, where, and how education is delivered, of the role of colleges and universities and the importance of lifelong learning (Kandri, 2020). Aspects of learning that were seen as knowledge ten years ago have changed in recent times (Snyder, 2020).

Consequently, quality teacher training (Sharma, 2020) and continuous professional development (Wyss & Robinson, 2020), alongside favourable working conditions and appropriate support need to be the focus of attention (UNESCO, 2016). In view of that, teacher-training programmes play an essential role in promoting successful integration of technology into the classroom among pre-service teachers (Cuhadar, 2018; Ertmer et al., 2012; Resta & Carroll, 2010) as they have a strong influence over the pre-service teachers (Sang, Valcke, Van Braak, & Tondeur, 2010; Tondeur et al., 2019; Tondeur et al., 2018). Teacher education programmes are

responsible as a guide to their technology implementation in their pedagogical knowledge (Cha et al., 2020).

Educational institutions are often at a risk of losing out in the “race between technology and education” (Peter, 2019) because of the rapid emergence of many digital technologies. It is worth noting that ICT tools will keep evolving and teacher educators need to be always updated as they are the ones responsible in moulding teachers-to-be of the 21st century (Adams, 2019). One way to improve teacher education is to examine the digital competence of teacher educators (Miguel-Revilla et al., 2020) and create an awareness that pedagogical practices are just as important while meeting the challenges of new technologies. In other words, teacher educators play a pivotal role to provide pre-service teachers with tools that can help develop their technological pedagogical content knowledge (Miguel-Revilla et al., 2020).

Aligned with the expectations of the 21st century, many existing frameworks emphasise the need for students to master the following skills: collaboration, communication, ICT literacy, social and/or cultural competencies, creativity, critical thinking, and problem-solving (Kereluik et al., 2013; Mishra & Mehta, 2016; Voogt et al., 2013). Meanwhile, the ‘Framework for 21st Century Learning’, by the US-based Partnership for 21st Century Learning (P21), proposed the 4Cs to be developed within the context of teaching core subject areas (Joynes et al., 2019) and the 4Cs are Critical thinking-Finding solutions to problems; Creativity-Thinking outside the box; Collaboration-Working with others; and Communication-Talking to others (Stauffer, 2020). As learning in this digital world is more about developing skills than just absorbing information, a student-learning approach with critical thinking, creativity, communication and collaboration are the game changers in the 21st century (Beas Dev Ralhan, 2019).

ICT, if successfully adopted, can further enhance student-centered learning processes in schools and this has become a key focus in educational research (Lai, 2008; Muianga, 2019). The use of technology in the teaching of 21st century skills “can improve the quality of the learning experiences if they are used as a participatory communicative tool to support collaboration and co-construction of knowledge” (Amutha, 2020; Lai, 2011, p. 1272). It has a generally positive effect on achievement (Tamim et al., 2011) besides making learning more enjoyable and fun (Erdem et al., 2019; Nartiningrum & Nugroho, 2020). Hence, the leverage of ICT to promote student engagement is pertinent for effective learning (Tan & Wong, 2020). Teachers must be equipped with various pedagogical approaches and take the opportunity to manipulate ICT for the development of students’ twenty-first century skills (Muianga et al., 2018; Voogt et al., 2013). In short, it is imperative that teachers master and employ ICT skills related to these skills as ICT skills has become the hub for twenty-first century skills.

The integration of ICT in T&L supports the constructivist teaching and the learning process (Hughes, 2013). With ICT, an effective learning environment is enabled by providing students with an avenue to deal with knowledge in active, self-directed and constructive ways (Luhmya et al., 2017). As computing is becoming more ubiquitous, the combination of technology and the constructivist approach is changing pedagogy. Students need to be engaged in meaningful tasks for meaningful learning to happen (Howland et al., 2012). Learning experiences and activities prepared for students to pursue should be engaging, active, constructive, intentional, authentic, and cooperative instead of only testing inert knowledge. Hence, pre-service teachers of this century need to be made aware of its importance and groomed in the process of integrating ICT into their lessons. In short, they must comprehend what makes learning experiences meaningful; be able to construct, implement and assess

meaningful learning tasks; and finally have the skills in using ICT to support this kind of T&L (Ashburn & Floden, 2006). In short, teacher education programmes are responsible as a guide to the technology implementation in the pedagogical knowledge (Cha et al., 2020)

As technology- and pedagogy-related knowledge domains are closely related to readiness for technology integration (Mishra & Koehler, 2006), the Technological Pedagogical and Content Knowledge (TPACK) framework is capable of substantiating an adoption of the digital competence of pre-service teachers in both initial and permanent lifelong training, besides being a useful assessment tool (Cabero & Barroso, 2016). Firstly, the TPACK framework develops teacher knowledge and secondly, it helps to develop better learning environments. It argues against teaching technology skills in isolation. Instead, it supports integrated and design-based approaches for teaching teachers to use technology. The TPACK framework can also be used in conducting scholarship and research into the nature and development of teacher knowledge.

In a critical review of research on TPACK in language teaching, “the quantitative studies suggested that language teachers might have varying levels of confidence in their TPACK competence in different contexts but most of the qualitative studies revealed that language teachers’ TPACK was associated with using technology to drill students, motivate students, and display content in teacher-centered instructions” (Jun-Jie Tseng et al., 2020, p. 9).

The TPACK framework has been used for the assessment of digital competence level among social studies trainee teachers (Colomer-Rubio et al., 2018) and based on the framework, progress towards digital competence among participants

is encouraging (Beriswill et al., 2016). Besides, TPACK has emerged as an exemplary framework for developing and unpacking teachers' professional knowledge for the technology-infused twenty-first century classroom (Harris et al., 2017). In addition, the development of pre-service teachers has been more conclusively described and analysed with the TPACK framework and this is an affordance for the assessment and improvement of programme designs for pre-service teachers (Gill & Dalgarno, 2017). It has also been used as the basis for identifying the desirable qualities of teachers in the next generation (Reyes Jr. et al., 2017).

The TPACK framework has since been used as a reference for many researches done on ICT integration (Aslan & Zhu, 2016; Baran et al., 2019; Ertmer et al., 2015; Nordin & Tengku Ariffin, 2016; Harris et al., 2017; Sakinah & Safinas, 2016; Uerz et al., 2018; Zainal, 2016). TPACK has also provided educators with a theoretical framework to unpack the complexity of technology integration (Redmond & Lock, 2019). The TPACK framework develops teacher knowledge and secondly it helps to develop better learning environments. It argues against teaching technology skills in isolation. Instead, it supports integrated and design-based approaches for teaching teachers to use technology.

In literature, teachers' technology competency has generally been agreed as a basic condition for technology integration (Lawless & Pellegrino, 2007; Malik et al., 2019; Muhaimin et al., 2019). Teachers need to have knowledge about technology so that teachers are able to manipulate the technologies to support the students' learning (Ramanair et al., 2017). However, Graham et al. (2004), OECD (2016) and DigCompEdu (corporate-body. JRC: Joint Research Centre, 2017) postulated that technology skill and knowledge alone would not enable teachers to become ready for technology integration. Therefore, instead of just focusing on teaching the

technological tools, training on ICT skills should reflect how technology can amplify great teaching and empower teachers to become better instructors to build teacher's competence in dealing with technology use in the classroom (OECD, 2018). As for the teaching of English, Tseng et al. (2020) proposed for more studies to be "conducted to understand language teachers' TPACK that involves the integration of technology into the practice and production stages of language learning" (p.16).

Preliminary research on the topic of this thesis was conducted prior to the study. The researcher interviewed three senior lecturers from the TESL department in an ITE in Malaysia. They have been lecturing for more than 10 years. There were four questions on the planned curriculum, eight on the delivered curriculum and two on the experienced curriculum. The findings revealed that opportunities for planning to teach with ICT was very limited and not found in the course summaries in the TESL major. It might have been embedded in the form of the rubrics in the practicum assessment form but not overtly stated. As for the lecturers themselves, ICT use was mostly at substitution level, using videos and power points to present information. They confessed about not having the expertise to teach their pre-service teachers as they were constrained by their own knowledge to the use of ICT. They admitted that they were digital immigrants and they were still learning themselves. Finally, they were of the opinion that the pre-service teachers were often lost in the use of ICT in the T&L. They felt the pre-service teachers were still not ready to use ICT to teach effectively in class - more of trial and error. The pre-service teachers might have the knowledge to use different types of applications from the Internet especially for social purposes but they were often overwhelmed when using ICT in class and forgot the rationale of using it. This preliminary study has ignited the motivation for the researcher to investigate the curriculum of the teacher education in preparing them for teaching

English in the 21st century. The preliminary research was an eye-opener for discussing the study background.

1.2 Background of the Study

In Malaysia, the Ministry of Education has identified 11 shifts to prepare the nation to meet the challenges of the 21st century. Shift 7 is to leverage ICT to improve quality learning across Malaysia. In view of that, RM6 billion has been spent on ICT over the past decade in education initiatives. This action has received recognition from UNESCO, 2012, as an articulate rational, well-defined and forward-looking policy for educational development. This transformation of the Malaysian education system will be implemented over a period of 13 years and three waves have been identified in the Roadmap: Leveraging ICT for learning:

- i. Wave 1 (2013-2015): Enhancing the foundation
- ii. Wave 2 (2016-2020): Introducing ICT innovations
- iii. Wave 3 (2021-2025): Maintaining innovative, system-wide usage

(Malaysia Education Blueprint 2013-2025, p. 6-20)

In Wave 1, the Ministry has provided the basic ICT infrastructures for students and teachers in all schools besides ensuring all teachers have basic competency in ICT. In Wave 2, improvement for distance learning and self-paced learning is accelerated while Wave 3 moves towards excellence and innovation by focusing on increasing school-based management and cultivating a peer-led culture of professional excellence. The focus of the three waves is on the macro level of technology use. This was done by providing the basic ICT infrastructures which is the most fundamental issue to be resolved and fostering new ways of learning through distance learning and self-paced learning which is an innovation to ICT use. However, merely getting

students ICT literate is not sufficient to leverage ICT for learning. Students should be able to apply the use of ICT to address larger, more complex, real-world professional issues. This is in tandem with the Ministry's objective to ensure the delivery of effective student-centred teaching and learning in every classroom (Malaysia Education Blueprint 2013-2025).

The Director General of Education, Ministry of Education Malaysia, Dr Amin bin Senin (2019), has stressed the importance of moving away from an exam-oriented system thus putting forth the idea for a pedagogical change from teacher-centred to student-centred. As part of the reforms in teacher education in responding to the digital economy, enhancing pre-service teachers' competency in the integration of ICT for 21st century learning skills is indispensable. Teachers and pre-service teachers should be ready with the knowledge to use technology to deliver the content knowledge in appropriate ways in the classroom - especially so the pre-service teachers, as they are the pillars of tomorrow in ensuring a full transformation in education innovation.

Teacher education in Malaysia needs to provide pre-service teachers with relevant pedagogical skills to prepare them for the challenges of 21st century skills (Alang Osman et al., 2015). Clearly, this view was also articulated in the speech by the Rector of Institute of Teacher Education Malaysia (ITEM) (Rusmini, 2020), which emphasised the importance of instilling critical thinking, problem solving, communication skills, working as a team besides skills related to technology skills (as cited in the World Economic Forum, 2020). To ensure a productive and effective education for the future, pre-service teachers and teacher educators should be prepared with the future skills required, embracing future-ready mindset and the awareness of all aspects of education.

In the teaching of English as a Second Language (ESL), many teachers still need to update their ICT pedagogical practices. A specific set of challenges have been identified which include keeping abreast with current language needs for 21st century learners and current trends in English language education (Abd Majid & Abd Rahman, 2021). The overwhelming preparation time and effort for using ICT to teach and promote Higher Order Thinking Skills are the main challenges encountered by ESL teachers (Ganapathy et al., 2017; Kit & Ganapathy, 2019). In addition, ESL teachers often felt stressed when they use ICT in class and ample time was needed for the planning and managing of ICT activities in their lessons (Undi & Hashim, 2021). Meanwhile, Malini et al. found the level of practice of 21st century pedagogical skills among ESL in-service teachers to be very low. The ESL teachers have the technological knowledge but not every teacher knows how to teach using technology. The use of enabling technologies was still missing in the teaching and learning. These challenges are present not only among the ESL teachers but also the ESL lecturers, who were found to lack the necessary knowledge to innovate their pedagogical practices with HOTS and ICT implementation (Ganapathy et al., 2017).

On the other hand, there were researches which have shown some positive contributions to ICT integration among the ESL teachers. Ponniah & Abdul Aziz (2022) concluded that identifying and implementing the suitable technology-based tools and methods by the teachers is vital for effective teaching in the primary ESL classroom. One example was the Digital Educational Learning Initiative Malaysia (DELIMA) supported by the big three tech companies, namely, Google, Microsoft, and Apple to aid the students while allowing the teachers to choose the learning context mode they are comfortable using. Meanwhile, Mohamad et al. (2017) found the electronic dictionaries in the smartphones handy and time-efficient for his students.

The ICT tool has promoted students' self-directed esteem to become independent learners and take responsibility in their learning as they controlled their own learning pace. They also found that other online educational platforms such as blogs, social media applications, and smartphones could alleviate and enhance both teachers' and students' language teaching and learning.

Similarly, Annamalai and Kumar (2020) found the use of smartphones were able to make the learning process more engaging. The smartphones also allowed personalised learning with no time and space constraints (Cross et al., 2019; Kukulska-Hulme & Shield, 2008). In another study by Annamalai (2019), she advocates the use of the WhatsApp platform and other technology tools which allow meaningful outcomes. She has also provided a frame of reference for lecturers to consider about how to use the apps wisely and to overcome the limitations.

Although technology is available to interact and collaborate, the approach taken by the Malaysian teachers is still teacher-centred. To maximise e-learning potential, and to ensure no student would be left behind, teachers need to be ready with technological knowledge, employ effective instructional pedagogy, and give constructive support to all needed in the ESL classroom (Kabilan et al., 2021; Lukas & Yunus, 2021). Educators need to possess the relevant pedagogical knowledge in order to create effective teaching and learning activities (Annamalai and Kumar, 2020).

As illustrated in the above literature reviewed, previous studies on ICT integration in Malaysia show that Malaysian teachers still lack TPACK to integrate ICT effectively in the ESL classroom (Annamalai. 2021; Garba et al.,2015). Young teacher candidates of the 21st century may feel technologically fluent, but they still do

not have the knowledge to integrate technology into their teaching purposefully (Martin, 2015). This issue persists due to their limited knowledge of technological pedagogical content knowledge (TPACK) (Garba et al., 2015; Nagaletchimee, 2021; Sharma, 2020). It is therefore timely to undertake an in-depth investigation on TPACK for 21st century learning skills (TPACK21cls) in the TESL curriculum in an ITE in Malaysia. Moreover, insights are needed in the way TPACK21cls was delivered and used in the teaching and learning of ESL. Specifically, there is a lack of research of TPACK21cls in the ITEs in Malaysia. Therefore, this study was conducted to fill the gap in the literature.

Figure 1.1 shows the components of TPACK21cls that are the focus in this study.

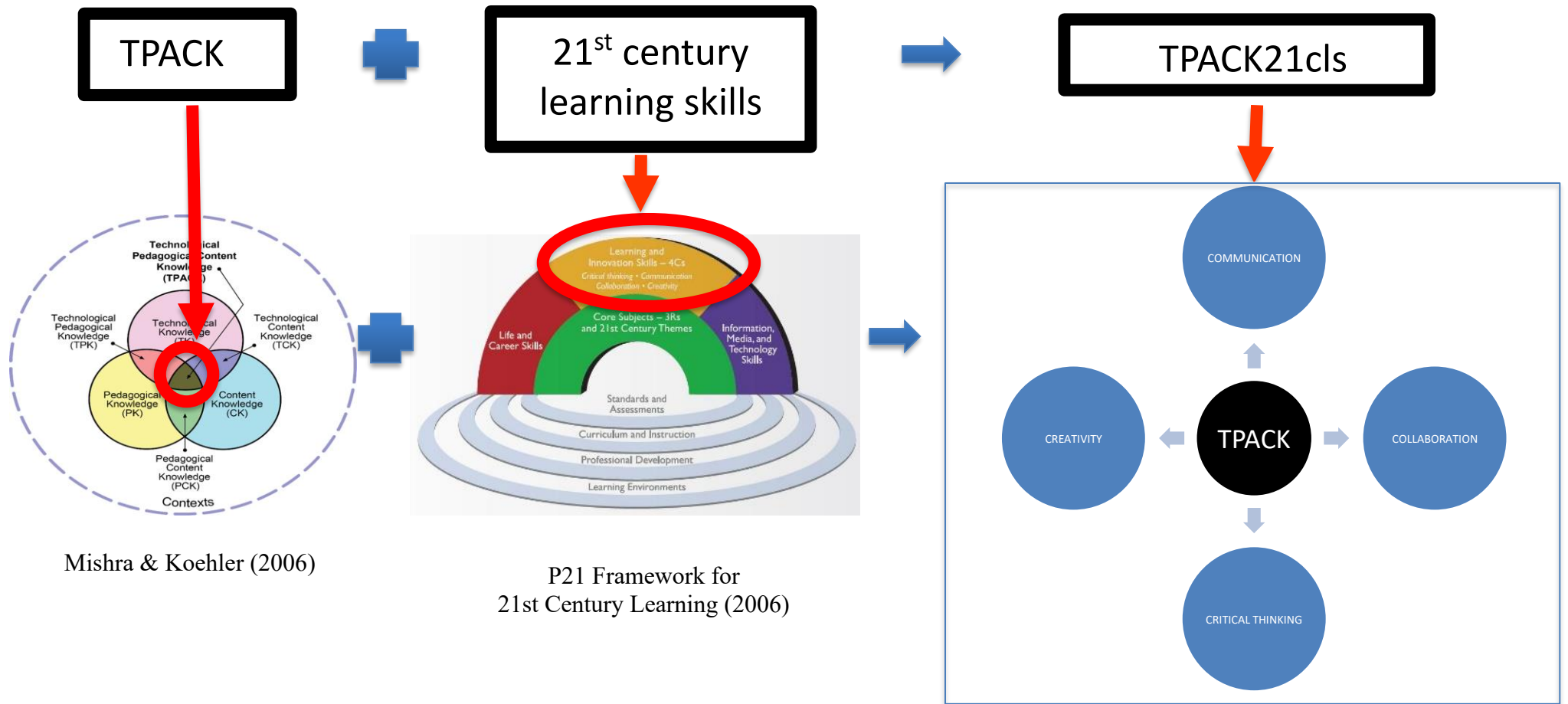


Figure 1.1 The components of TPACK21cls

1.3 Statement of the Problem

Many teachers are using technology to present and teach but without the knowledge of the availability, benefits and know-how of technology in teaching-learning situations (Mynaříková, Novotný, 2021). In addition, there is still a lack of training on ICT skills to reflect how technology can amplify great teaching and build teachers' competence in dealing with technology use in the classroom (OECD, 2018). The statement of the problem is discussed from three different perspectives. They are the challenge to provide a comprehensive knowledge on effective integration of technology, the limited support and preparation for ICT integration, and the poor quality of ICT integration by pre-service teachers.

The first issue is the challenge to provide a comprehensive knowledge on effective integration of technology that a pre-service teacher needs in teacher education programmes (Boston, 2019; Gudmundsdottir & Hatlevik, 2017; Khine et al., 2019; Rana & Rana, 2020; Tojan Alsharief, 2018; "TPACK: Where Do We Go Now?" 2009). Tojan Alsharief (2018) found that teacher education programmes did not prepare pre-service teachers for ICT use in their instructional practice while Khine et al., 2019 reported the absence of a course to offer content, pedagogical skills, and technology know-how simultaneously so that pre-service teachers will gain both theoretical and practical knowledge that are intrinsically linked. Other researches also discovered that many teacher preparation programs were in need of an overhaul as they are found to be based on out-of-date technology models (Gudmundsdottir & Hatlevik, 2017; Martin, 2015; Tojan Alsharief, 2018). Another recurring concern was the inadequate monitoring of teachers' development and their integration practices of ICT (Aşık et al., 2019; UNESCO 2016). Simply instructing pre-service teachers on

how to use digital tools and resources might not be sufficient as they should be capable of going beyond that (Redecker & Punie, 2017; Wang, 2021). There is still a lack of effective delivery of an ICT-based curriculum (Lakshmi, 2016; Tojan Alsharief, 2018). In addition, many teacher educators deem themselves to be weak in their own knowledge and skills besides having limited opportunities to develop their integrated TPACK (Voogt & McKenney, 2017). This leads to the next issue, which is the limited support and preparation for ICT integration given by the teacher educators.

The second issue is clearly illustrated in a study by OECD (2020). Only 56% of teachers across OECD received training in the use of ICT in their formal education and only 43 % of teachers felt well or very well-prepared for this element when they completed their initial education or training. The limited support is further depicted in the study when teaching with ICT was recorded as the second highest need for professional development after teaching students with special needs (OECD, 2020). This finding concurs with the finding in the first volume of Teaching and Learning International Survey (TALIS) 2018, where teachers expressed their need for more training in competencies required for 21st century education such as using ICT to teach. To add on, Tran et al. (2020) also found that ICT integration in training pre-service teachers was rather limited. Current language teaching pedagogy cannot merely be ‘computerized’ – instead, new ways of teaching must be created when new technologies are introduced (Lawrence, 2018). The biggest challenge in technology integration is not the technology itself but the changes in methodology that it brings about (Lawrence et al., 2020; Rahimi & Pourshahbaz, 2019). In such a situation, teacher educators need to play a critical role to prepare pre-service teachers with the relevant knowledge (Demirtaş & Mumcu, 2021; Koch et al., 2012; Thomas et al., 2013; Hsu 2012; Redmond & Lock, 2019). However, the modeling of ICT integration

is lacking (Gill et al., 2015; Sweeney & Drummond, 2013; Tojan Alsharief, 2018; Tondeur et al., 2019). Teacher educators themselves are struggling to keep abreast with current technologies (Tondeur et al., 2016; Reyes Jr. et al., 2017; Uerz et al., 2018; Voogt & McKenney, 2017). Supporting this point is the study by de Los Reyes et al. (2017) who discovered only 27% of teacher educators are using and teaching technology; 31% are users of technology but not necessarily teaching it, and 41% reported an uncertainty towards using and teaching technology. Teacher educators are in need to be updated with the latest trend of technology experience to add momentum to the job of moving education forward (Newton, 2020).

The next issue is the poor quality of ICT integration in the T&L. Many teachers at schools are still using ICT parallel to the traditional method. It was found that 47% of teachers across the OECD were not using ICT for projects or class work we (OECD, 2020). To add on, 25% of school leaders reported that teachers are limited in their use of ICT (OECD, 2020). As for pre-service teachers, ICT use was found only limited to Power Point presentation and YouTube (Singh & Kasim, 2019); and many graduated but were under equipped to teach with ICTs (Chigona, 2015; Dinc, 2019). Even if they do, they do not apply innovative teaching strategies (Tondeur et al., 2017) and the integration of ICT was only at modest attempts (An & Reigeluth, 2012; Aslan & Zhu, 2016; Batane & Ngwako, 2017; De Santis & Rotigel, 2014; Habte Mare et al., 2019; Raman & Halim Mohamed, 2013). Other issues among pre-service teachers include the lack of confidence in ICT integration (Abdullah et al., 2016; Tojan Alsharief, 2018; Tondeur et al., 2017) and the lack of knowledge, skills, and experiences in integrating ICT into their T&L though they are aware of its importance. Though some have a high level of competency in using technology resources, they are not using ICT in their T&L (Batane & Ngwako, 2017).

In short, not only pre-service teachers were lacking with high-quality technology experiences (Foulger et al., 2017; Wang et al., 2018) but teacher educators were also in need to be updated with the latest trend to add momentum to the job of moving education forward (Newton, 2020). Therefore, the need arises to develop technology integration among both pre-service teachers and teacher educators (Messina and Tabone, 2015).

Based on the issues discussed, this is an opportune time to investigate the curriculum of the pre-service teachers in ITEs. This is so, when there is a lack of research on TPACK being conducted among TESL student teachers in Asian countries (Sakinah & Safinas, 2016), especially primary school pre-service teachers (Nordin & Ariffin, 2016). If this study is not conducted, the lack of explicit curriculum guidance on ICT integration may cause pre-service teachers to fall back on their traditional training and practices (Dong & Newman, 2018). In addition, without experience on purposeful and effective use of technology in their teacher education courses, the pre-service teachers will not be able to see the relevance of using technology in their own teaching in the future (Voogt & McKenney, 2017).

1.4 Rationale of the Study

The rationale of this study is to investigate the development of TPACK21cls in the *PISMP* TESL pre-service teachers' curriculum. It hopes to be able to improve the quality of teaching their ESL instructional designs and teaching practice as education systems are increasingly embedding digital competencies in their curricula (Larson, 2020; OECD, 2019). Pre-service teachers should be provided with high-quality technological experiences throughout the entire teacher preparation program by all teacher educators (Foulger et al., 2017; Wang et al., 2018). Also, teacher

educators need to be updated with the latest trend to add momentum to the job of moving education forward (Newton, 2020). Therefore, it is a pressing need to develop technology integration among both pre-service teachers and teacher educators (Messina & Tabone, 2015).

Meanwhile, the first step to teaching 21st century skills effectively is to design a curriculum that adopts 21st -century skills as its core objectives (Md, 2019; Purohit, 2020). Adequate planning, teaching the use of technology, and teaching through classroom presentations are effective strategies of teaching 21st century skills, before commencing teaching of 21st century skills (Dean, 2017; Kaufman, 2013); and the infusion of TPACK for 21st century learning skills into the curriculum of the *PISMP* TESL curriculum would be a way towards achieving the goal. Nevertheless, teacher education institutes are not spending enough time on teaching with technology. Some of the educators are not even aware about software applications that could add value to the early literacy using technology of their students (Voogt & McKenney, 2017).

It is therefore important to underline the importance of the integration of technology into all pedagogy courses across the entire teacher education curriculum, and not only offering separate skill-focused technology courses (Martin, 2018; Tondeur et al., 2017). Research, appropriate international/national survey on curriculum implementation, multi-stakeholder consultations and global peer learning is timely for successful implementation (OECD, 2019; Rusmini, 2012). In order to do so, education institutions need to heed the call by the Education 2030 Framework for Action to prepare qualified, trained, inspired, dedicated teachers who use relevant pedagogical approaches. Although the 2030 Agenda for Sustainable Development (Press, Monolith, 2015) has indicators for measuring digital infrastructures in educational centers, there are no indicators available in relation to the level of digital

competence for teachers, nor the use and integration of ICT in teaching processes. Therefore, investigating how teacher education in Malaysia prepares its pre-service teachers' for 21st century learning with ICT is very significant.

1.5 Scope of the Study

The scope of the study was on the views of the participants who were TESL pre-service teachers from the June 2016 intake, on the delivery of TPACK21cls by the teacher educators, and their own readiness to use technology in their T&L in the primary schools in Malaysia. Also included in the scope was the analysis of the PISMP guidebook, course summaries and lesson plans of the participants during their Practicum 2. The study in this research was on one ITE in the northern part of Malaysia, wherein the opinions of 11 participants were studied in interview sessions and one-time reflections. The collection of data was administered from January to June 2022.

As the objective of the study is to analyse how TPACK21cls was developed in the planned, delivered and experienced curriculum, the level of TPACK21cls among the pre-service teachers was not statistically measured. It relied largely on self-reflections, interviews and document analysis to gauge the development of TPACK21cls in the *PISMP* TESL curriculum.

In the selected ITE, there were three cohorts of pre-service teachers. They were the June 2014, June 2015 and June 2016 intakes. There were altogether 14 classes and 223 pre-service teachers. For the 2016 intake, there were six major courses while the 2015 intake had five and the 2014 intake had only two. Of the three cohorts, there was only one cohort with the TESL programme. It was in the 2016 intake. This ITE was selected for the study because there was only one cohort for the TESL programme.

This was a unique characteristic as the views of the pre-service teachers in the ITE would be genuinely their own, unbiased and not influenced by any seniors or juniors from the TESL programme. Besides that, this ITE was selected because it is situated in an urban area and the schools that the pre-service teachers were sent to for practicum had the same facilities for ICT integration. Hence, it would be most appropriate for this study.

1.6 Purpose of the Study

The purpose of this study was to explore and understand how the knowledge to use ICT in T&L was developed in the *PISMP* TESL curriculum. This study focuses on the initial definition of TPACK that highlighted the point of intersection among the three core domains of teacher knowledge (pedagogical [P], content [C], and technological [T]), which is a unique knowledge regarding how technology helps learners master specific subject matter (Brantley-Dias & Ertmer, 2013), and the 4Cs of the 21st century learning skills.

It was an attempt to investigate the curriculum of the ITE by drawing the insights of the pre-service teachers and examining the documents related to the planned and experienced curriculum to help develop TPACK21cls for quality ICT integration, identify needs and gaps, and make recommendations to revise the curriculum. The overall aim of this study was translated into three specific objectives which were expressed in the form of research questions.

1.7 Objectives of the Study

In this case study, the researcher aims to investigate how the ITE curriculum has prepared the pre-service teachers to use ICT for 21st century learning skills in their T&L. In line with this principal aim, the specific objectives of the study are as follows:

- 1.7.1 To investigate the development of TPACK21cls in the *PISMP* (TESL) planned curriculum in the ITE in Malaysia.
- 1.7.2 To investigate the support for TPACK21cls provided by the lecturers to the pre-service teachers, in the *PISMP* (TESL) delivered curriculum in the ITE in Malaysia.
- 1.7.3 To investigate the *PISMP* (TESL) pre-service teachers' level of TPACK21cls during their practicum in the ITE in Malaysia.

1.8 Research Questions

The specific research questions below are presented to structure the research processes, including data collection and analyses:

- 1.8.1 How is the TPACK21cls in the *PISMP* (TESL) planned curriculum in an ITE in Malaysia developed?
- 1.8.2 How is the support for TPACK21cls provided by the teacher educators to the pre-service teachers in the *PISMP* (TESL) delivered curriculum in an ITE in Malaysia?
- 1.8.3 What is the *PISMP* (TESL) pre-service teachers' level of TPACK21cls during their practicum in an ITE in Malaysia?

1.9 Significance of the Study

This study hopes to contribute towards enhancing the understanding and implementation of the concept of TPACK21cls among pre-service teachers and teacher educators in Malaysia. It is hoped that the findings of this study would be able to inform the review and design of teacher education programmes to address TPACK21cls capabilities. This study hopes to provide opportunities for initial teacher education curriculum makers to have a better insight of how TPACK21cls can be developed among the pre-service teachers.

From the policy perspective, the study hopes to provide information on how the components of TPACK21cls can be developed within the planned curriculum. This is because the planned curriculum has a very important influence on the delivered curriculum and learning largely takes place within the confines of the delivered curriculum (Prideaux, 2003). Then for effective development of the TPACK21cls in the delivered curriculum, the teacher educators play an undeniable important role. This study therefore has the potential to contribute significantly to the theory of curriculum development by putting emphasis on the role of the teacher educators in ITEs in the delivery process of the curriculum. The researcher hopes to provide a guideline for the lecturers to support the pre-service teachers for improved performance in ICT use for 21st century learning skills.

Clearly, this research is looking at the process of knowledge dissemination in ITE and also for continuous professional development instead of the effectiveness of a product. Unlike most local studies in Malaysia, this study does not evaluate teacher educators' TPACK level and perception on technology acceptance. Instead, it provided a useful addition to available references regarding pre-service teachers' TPACK21cls

readiness in Malaysia and thus bridging the gap by proposing ways for further professional development for the pre-service teachers as they enter the realm of teaching as initial teachers.

Finally, it is hoped that this study contributes to the growing body of knowledge of TPACK21cls in using ICT to teach English. It is anticipated that the findings will help the other researchers in this field to continue their research for a more in-depth and comprehensive understanding on how to integrate ICT in the T&L in the 21st century, to produce pre-service teachers leaving the institute of education with sufficient TPACK21cls for quality learning, and raising pre-service teachers' competencies in the integration of ICT for the 21st century classroom (Chai et al., 2019). The findings will be two-fold as they will not only contribute to the improvement of the curriculum but also serve as a guide to provide continuous support to teacher education,

1.10 Operational Definitions

Operational terms used in this study are defined in the following sections.

1.10.1 TPACK

TPACK is the knowledge and ability to use appropriate technology tools or applications to deliver a certain concept effectively to enhance student learning experiences (Rodgers, 2018). The knowledge to be exploited is the intersection of Technological Pedagogical and Content Knowledge (TPACK), which is understood as knowledge of the use of technology to implement teaching methods for different types of subject matters, and in this study, the teaching of English as a Second Language.