



## A Framework for Seeking the Connections Between Technology, Pedagogy, and Culture: A Study in the Maldives

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### Abstract

Educational technology researchers have often overlooked the effect of culture on teachers' use of digital technologies in their pedagogical practice. Several technology integration models, such as the Technology Adoption Model (TAM) and Technological, Pedagogical and Content Knowledge (TPACK), have also failed to explain the connections between technology, pedagogy, and culture. This paper argues that teachers' pedagogical and technological practices cannot be fully understood without considering the social and cultural norms of their specific cultures. An ethnographic methodology, linked to Bourdieu's (1977) habitus, is used to explore teacher educators' practices in the Maldives. The author uses interviews, observations, focus groups, and the hanging-out approach to gather data from eleven teacher educators who work in a Maldivian university. Key findings demonstrate that teacher educators' pedagogical and technological practices are influenced by their own culture, their early learning experiences in the Maldives, and their workplace (institutional context). Through this finding, the paper proposes a framework; namely, Pedagogical and Technological Cultural Habitus (PATCH), for understanding teachers' pedagogical and technological habitus in various contexts. The PATCH framework provides a theoretical basis for designing technology-oriented professional development for professionals in various pedagogical contexts, including virtual and blended pedagogical spaces. It also contributes to the TPACK framework by adding an outer layer to its current theorisation to represent teachers' backgrounds and habitus when examining their practices.

Keywords: technology; habitus; culture; teacher educator; Maldives

### Introduction

The literature highlights the notion that traditional teaching methods continue with the addition of digital technologies in many pedagogical contexts (Adams, 2012; Bang & Luft, 2013; Baran, 2010; Jones, 2003; Judson, 2006; Perkins, 2012; Pritchard, 2007; Sipilä, 2010; Zisow, 2000). Considering these studies were published at different times from the 2000s to 2010, we can conclude that using digital technologies does not necessarily change teachers' pedagogical practices. However, these researchers discussed their view of designing learning that links to the social constructivist view of learning. They suggest that understanding, meaning, or interpretation is derived partly from an individual's interaction with others in the learning context. This idea of how knowledge is constructed is derived from social-cultural theory as proposed by Vygotsky (1978). In this theory, knowledge is actively internalised through conversations or interactions between learners and other individuals who are more knowledgeable. The literature in this regard suggests that student interaction is a key element of constructivist learning when designing learning and teaching with digital technologies. This view links to the idea of using technologies to facilitate learning rather than delivering learning

through them. This means that students would be given opportunities to construct knowledge through their use of technologies, instead of teachers using technologies to deliver knowledge. The former is student-centred, while the latter remains teacher-centred.

In the context of this research, and given that digital technologies have been introduced only in the 2000s, the ways in which teacher educators use digital technologies could mirror issues such as those examined by the above researchers. The meaning of effective pedagogical practices can therefore be interpreted differently depending on the available digital technologies and teachers' understanding of what suits their students' learning. Adams (2012) believes that the constructivist view of learning was not originally grounded on a basis of understanding that included the role of digital technologies in teaching or the role of teachers when using these tools. Judson (2006) argues that although constructivist learning and the integration of technology has "long been tagged with the reform label" (p. 592), it has not been clear how constructivism and technology integration are entwined. Adams (2012) also claims that constructivism should not be seen as a prescription for technology-integrated pedagogical practice. Both these researchers further assert that teachers often concentrate on making the best use of digital technologies, ignoring the effect of their use on student learning and their teaching approach. Given that Judson's and Adams's concerns were raised at different times (one in the mid-2000s and the other in the 2010s), there may be concerns about why teachers focus on technology rather than their teaching approaches.

The literature discussed above anticipates a change in pedagogical practice when digital technologies are integrated with classroom teaching. The studies draw attention to the complexity of integrating digital technologies in teaching, which is also widely examined through two models; namely, Technological, Pedagogical and Content Knowledge (TPACK) and the Technology Adoption Model (TAM).

### **Technological, Pedagogical and Content Knowledge (TPACK)**

According to Koehler and Mishra (2008), technology introduces additional variables to the learning and teaching context that demand teachers change their practices, and eventually add double complexity to their pedagogical approaches. This double complexity is represented in terms of marrying teachers' use of digital technologies with their pedagogical approaches. Mishra and Koehler (2006) proposed the TPACK framework for integrating technology in pedagogical practice in both teacher education and professional learning in schools. The TPACK model was originally an expansion of the Pedagogical Content Knowledge (PCK) model theorised by Shulman (1986). Shulman critiqued the way the two types of knowledge (content and pedagogy) were being treated in isolation from each other in teacher education programmes. Shulman (1986) argues that, because content and pedagogy are interrelated, pre-service teachers should have a deep understanding of both types of knowledge. Mishra and Koehler (2006) adopted this view and extended the argument with a new conceptualisation of teacher knowledge, which can be understood as three important domains for teacher knowledge, as illustrated in Fig. 1.

Mishra and Koehler (2006) argue that since technology has become an important tenet of teaching and learning processes and, more particularly, due to its potential for improving learning and teaching processes, teachers need to understand the relationship between the three types of teacher knowledge: content, pedagogy, and technology. Harris, Mishra, and Koehler (2009) believe that some teachers often use digital technologies to merely deliver content they want to teach, whereas others also use digital technology as a transformative tool in their teaching of subject matter. Koehler, Mishra, and Yahya (2007) suggest that this complexity arises as a result of teachers' lack of understanding of the relationships between content, pedagogy, and technology and the context in which they function. The literature cited here

suggests that teachers require certain competencies in terms of connecting the three types of knowledge: content (subject area), pedagogy (teaching knowledge), and technology (technology background).

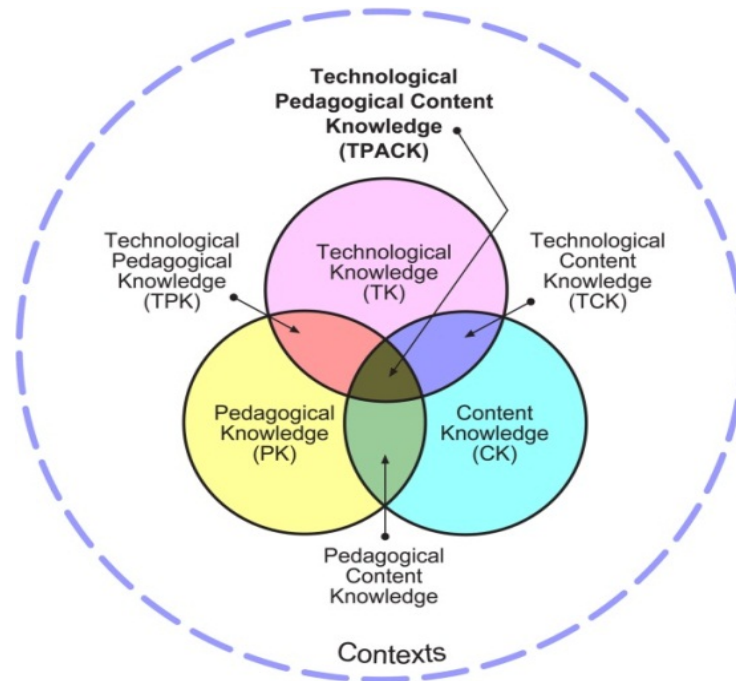


Fig. 1 Technological, Pedagogical and Content Knowledge, Source: Mishra and Koehler (2006). Reproduced by permission of the publisher, © 2012 by tpack

Table 1 illustrates a large body of literature that discusses the TPACK framework and its application in teacher preparation contexts and teachers' classroom practices.

Table 1 TPACK research with teachers and pre-service teachers

Source	Context	Methodology	Key findings
(Chai, Ling Koh, Tsai, & Lee Wee Tan, 2011)	Measures of TPACK in teacher education (Singapore)	Quantitative	Pedagogical knowledge had a direct effect on TPACK at the beginning of the course, and strengthened during the course.
(Ching Sing, Joyce Hwee Ling, & Chin-Chung, 2010)	Examines TPACK knowledge among pre-service teachers (Singapore)	Quantitative	Technological knowledge, pedagogical knowledge, and content knowledge are significant predictors of pre-service teachers' TPACK; and pedagogical knowledge has the largest effect.

Source	Context	Methodology	Key findings
(Harris & Hofer, 2011)	School teachers (USA)	Qualitative	After completing a professional development programme on TPACK, researchers examined teachers' use of TPACK: a) teachers selected technologies more consciously, strategically, and thoughtfully for student learning; and b) teachers' instructional planning became more student-centred and more focused on student learning.
(Hyo-Jeong & Bosung, 2009)	Pre-service teachers (Singapore)	Mixed method	Participants had theoretical understanding of pedagogical knowledge; however, their lesson designs showed a mismatch among technology tools, content representations, and pedagogical strategies.
(Koh, Chai, & Tsai, 2013)	School teachers (Singapore)	Quantitative	Teachers perceived TPACK to be formulated from the direct effects of technological knowledge and pedagogical knowledge. They also perceived these knowledge sources as contributing to the development of technological pedagogical knowledge and technological content knowledge, which also contributed to their TPACK.
(Niess, 2005)	Pre-service teachers (USA)	Qualitative	Five cases described the difficulties and successes of student teachers teaching with technology in developing their TPACK.
(Polly, 2011)	School teachers (USA)	Qualitative	In a year-long professional development programme, two cases displayed evidence of understanding TPACK; however, their enacted pedagogies did not completely align with the pedagogies emphasised during professional development.
(Schmidt et al., 2009)	Pre-service teachers (USA)	Quantitative	Suggested that the modification to 18 survey items in the TPACK survey made it more reliable and valid to help educators design longitudinal studies to assess pre-service teachers' development of TPACK.

The studies in Table 1 outline TPACK's contribution to understanding the complexity of technological and pedagogical practices in schooling contexts. However, none of these studies addressed the influence of teachers' backgrounds or culture in relation to how they understand or practise their theoretical understanding of TPACK. Some studies (Niess, 2005; Polly, 2011) highlighted reasons for the difficulty of enacting TPACK in pedagogical practices, but there is little explanation of teachers' backgrounds when examining participants' TPACK. It could be argued that TPACK's theorisation does not leave room for explaining teachers' backgrounds when investigating pedagogical practices—although the TPACK diagram now situates the interconnecting rings in an area marked “context”, the context is not defined (Fig. 1). Because context is an outer circle, we could assume that it relates to teachers' backgrounds. However, the authors of the TPACK studies in Table 1 did not take teachers' backgrounds into account when explaining the idea of context. Moreover, most of these TPACK studies are quantitative—researchers focused on examining teachers' understanding of TPACK constructs by using questionnaires, rather than looking at their actual pedagogical practices.

Despite the contribution of the TPACK framework, Koh et al. (2013) claim that even after many years of study, teachers' application of TPACK in teaching remains unclear. Through a professional development project, Pierson and Borthwick (2010) offer additional elements to the TPACK model to explain teachers' conceptualisation of TPACK. These elements relate to individual and organisational learning. Pierson and Borthwick (2010) argue that teachers need to understand what works, and in which contexts they can use technologies when teaching. In this regard, TPACK researchers provided limited knowledge about teachers' backgrounds and culture when they examined teachers' use of digital technologies in pedagogical contexts. This view leads to a critical gap even in the TPACK model itself when understanding technological and pedagogical practices specifically in cultural contexts.

### **Technology Adoption Model (TAM)**

Several studies discuss teachers' adoption of technologies. Some of these studies argue that acceptance of technology depends on the benefits that teachers gain by using those technologies in their teaching. This idea was originally introduced by Davis (1989) when explaining why people adopt certain technologies in their work. Davis (1989) proposed a model called Technology Acceptance Model (TAM). This model suggests that people accept technology for two reasons: usefulness and ease of use. The model was originally introduced to understand technology use in business contexts. However, it has been used by many researchers to understand technology-integrated pedagogies in various contexts of research. For example, Ajzen and Fishbein (1980) explain that there is a causal link between the benefits perceived by teachers and the ease of technology use with respect to their attitudes and intentional teaching actions. However, this study is now more than 20 years old and, given the rapid changes in digital technologies over the last two decades, this finding might no longer be valid. It is timely that it is examined.

Additional recent studies and reviews (e.g., Aldunate & Nussbaum, 2013; Govender, 2012; Howard, 2013; Lai & Chen, 2011; Somekh, 2008; Sprankle, 2012; Wright, 2014) suggest that teachers' adoption of digital technologies can be associated with the perceived benefits, and their findings can be useful in understanding the benefits of using digital technologies perceived by teacher educators in the context of my research. However, these studies provide little explanation about the connections between teachers' backgrounds and the benefits gained by using digital technologies in teaching. My research aims to understand whether teachers' use of digital technologies, and the benefits they perceive, have any link with their own backgrounds or cultural dispositions.

Some researchers have attempted to explore the factors that could explain what is behind a paucity of pedagogical change regardless of technology use in teachers' practices. Reflecting on these studies (e.g., Aldunate & Nussbaum, 2013; Chapman & Gaytan, 2009; Falloon, 2011; Gülbahar, 2008; Ihmeideh, 2009), it seemed to me that these researchers had overemphasised teachers' competencies in using technologies, rather than exploring the associated influence of their backgrounds or understanding why their practices may have remained highly teacher-centric. These researchers appeared to be techno-centric when examining teachers' use of technologies. A more nuanced explanation could have been provided if they had attempted to understand teachers' backgrounds and cultures.

In short, technology integration models have paid scant attention to the connections between culture and teachers' use of technologies in teaching. Both the TPACK and TAM studies discussed above provide limited understanding of teachers' backgrounds and culture when exploring their use of digital technologies. My examination of the literature suggests that there is a critical gap in understanding the connection between culture and the way these teachers used digital technologies in teaching. My research examined a group of teacher educators' use of digital technologies in their pedagogical practice in the Maldives, aiming to explain the connections between teacher educators' culture, how they taught (pedagogy), and how they used digital technology (technology) in their teaching.

## Study design

The study adopted an ethnographic methodology to investigate how teacher educators' use of digital technologies in their pedagogical practices was formed in the Maldives. The ethnographic methodology adopted to explore teacher educators' practices had two foci: institutional (teacher education context) and cultural (the connection between teacher educators' early background and their later formed practices).

Ethnographic design was chosen for this research because it involves understanding culture(s) (Denzin, 2000; Fetterman, 2010; Goodall, 2003; Wolcott, 1987). Wolcott (1987) argues that ethnographic research describes cultural entities in individuals' actions and practices. According to Hammersley and Atkinson (1995), ethnography emphasises enhancing the ground understanding of participants' contexts. Participant teacher educators in this research worked in an institution in a small country, in a specific cultural context, in which their workplace context can influence how they form specific practices. Charmaz (2006) defines ethnography as understanding about a "particular group" (teacher educators) and thus entails sustained participation and observation in their "milieu" (workplace), "community" (professional interaction with other colleagues), or "social world" (professionals' surroundings) (Charmaz, 2006, p. 21).

Prior to conducting this research, ethical approval was sought and granted by the University of Waikato. Eleven Maldivian teacher educators were interviewed individually and, in the initial visit in May 2011, six of them were observed teaching in a classroom. Eleven months later, ten teacher educators participated in focus groups and five of those were interviewed for further clarification. Additional evidence was collected through reflective journal field notes and included informal activities with ten participants over two visits: at the beginning of 2012 (6 weeks) and again in 2013 (5 weeks).

The main findings were generated through various strategies adhering to grounded theory, linking it with Bourdieu's (1977) habitus lens (seeking connections between participants' practices and their backgrounds within their specific culture), as outlined in Fig. 2 and illustrated with examples in Table 2.

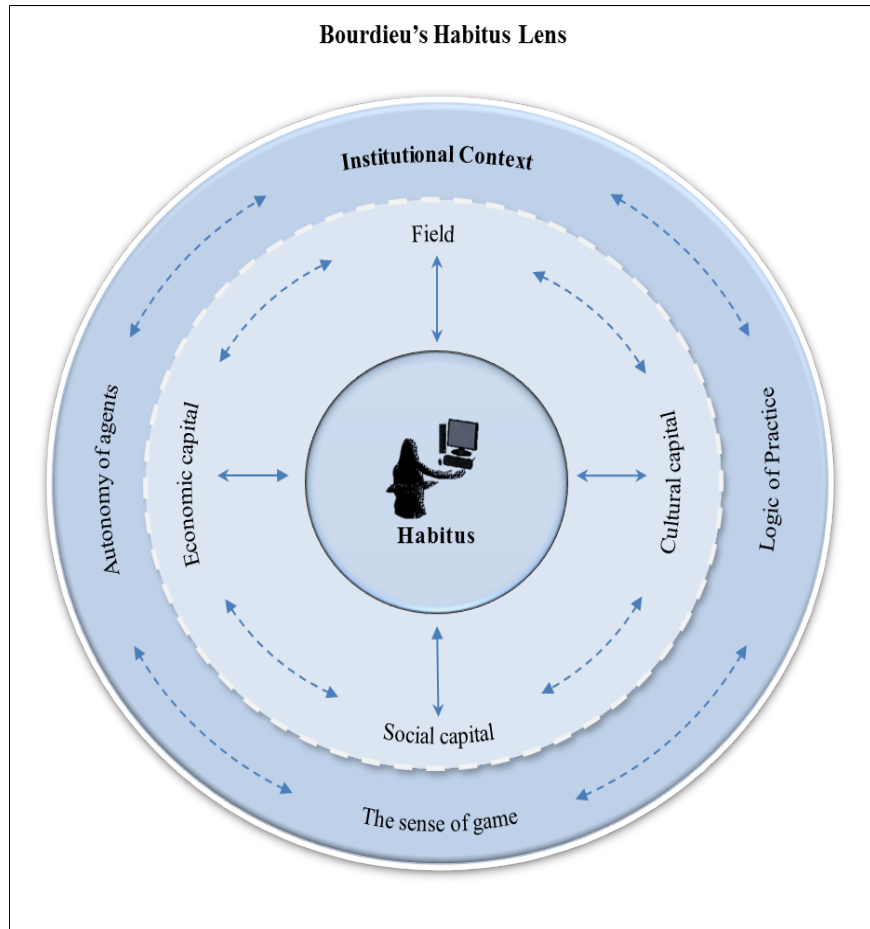


Fig. 2 Bourdieu's (1977) habitus lens. Source: (Adam, 2015)

Table 2 Main elements focused in the analysis (informed by Bourdieu [1977])

Bourdieu's concepts (1977)	Key focuses
Field	Understanding teacher educators' formed dispositions in their specific culture and the context of practice. Examples: the Maldivian culture; the workplace culture; participants' beliefs about specific pedagogies; their backgrounds, qualifications, experiences of teaching; or digital technological tools they use in teaching
Cultural capital	Considering teacher educators' cultural background, including some cultural practices that may be involved in their informed practices
Social capital	Exploring the network of their social relations to explain how their social capital influenced their formed practices (e.g., people who have been involved in their early learning experiences and formed practices in an institutional context)
Economic capital	Recognising the facilities available, the quality of resources in their workplace, and how these resources have informed teacher educators' practices

<b>Autonomy of agents</b>	Understanding teacher educators' actions and intentions in terms of their adoption of tools or the change that occurred or continued in their formed practice
<b>Sense of the game</b>	Identifying teacher educators' reasons for adopting specific tools, and the resulting changes to their practices
<b>Logic of practice</b>	Understanding the rationale of their pedagogical thinking and the logic behind their formed practices

Table 2 illustrates the main concepts that are involved in investigating teacher educators' use of digital technologies in their pedagogical practices. Along with this, several strategies (e.g., diagramming) were used iteratively to seek connections between teacher educators' pedagogy (how they taught), technology (what they used and how they were used), and culture (their early backgrounds and cultural practices) in the Maldives.

## Findings

The study findings indicate that teacher educators' pedagogical and technological practices are influenced by their social cultural learning norms, such as learning to recite the *Qur'an* without understanding it. This cultural practice has also unconsciously influenced both teacher educators' views of learning and the pedagogical practices that they formed later. This study indicates that the teacher educators formed cultural habitus in their pedagogical and technological practice through the influence of their culture and workplace context. However, the habitus they formed involved three aspects that are represented in these two components (culture and workplace context).

These three aspects are cultural (such as learning to recite the *Qur'an* without understanding, reinforced with rote learning experiences during schooling); technological (benefits gained from technology as they continued to teach content); and pedagogical (pedagogical purposes of teaching content) as presented in the following three cases. These aspects resulted in teacher educators forming an overall pedagogical and technological cultural habitus (PATCH) in their practices. More specifically, the teacher educators' content-oriented pedagogical habitus was influenced by both their culture and their institutional pedagogical context, while their PowerPoint-assisted technological habitus was heavily influenced by their institutional context. Figures 3, 4, and 5 show the analysis for three teachers.

### Shaina's case

Shaina's cultural habitus represented the strongest influence on her shaping of PATCH. Figure 2 shows that the cultural practice (common in the Maldives) of learning by recitation of the *Qur'an*, and her early learning experiences, influenced Shaina's formation of a dominant cultural habitus. Specifically, this cultural habitus was based on the high value she placed on her grandmother's teaching and the teaching of the *Qur'an*. This habitus became dominant in her later practice as a teacher educator. Although the other two types of habitus influenced the formation of Shaina's overall PATCH, the degree of influence from the other habitus seemed less significant. The researcher was able to grasp this understanding while synthesising the elements of Shaina's journey.



SHAINA's Cultural Habitus in PATCH Framework

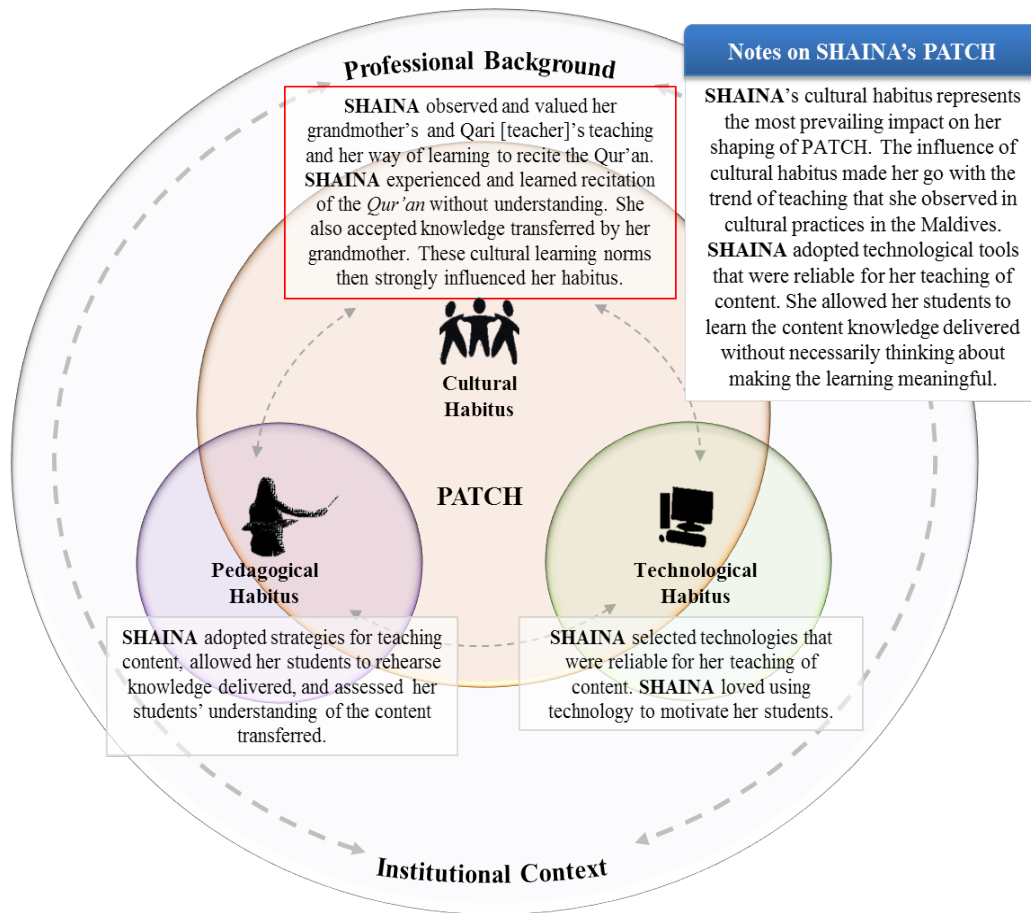


Fig. 3 Shaina's cultural habitus in her PATCH

Analysis of data from various sources (interview, observation, focus group, hanging out with her, and a follow-up interview) demonstrated Shaina's appreciation of this cultural practice and the value she has given to this way of learning. For example, in the initial interview, Shaina told how much she valued her grandmother's teaching and, in focus groups, she again discussed her appreciation of the spiritual value of that learning. She supported the way *Qur'an* is taught in the Maldives. Shaina further strengthened the validity of this finding as she repeatedly discussed the values of this rote learning in her follow-up interview (the last phase of data collection). Although she loved using technology to motivate her students and make her teaching easy, her pedagogical strategies were based on the cultural practice associated with the rote learning and recitation of the *Qur'an*. As demonstrated in her vignette, Shaina's pedagogical practice centres on teaching to deliver knowledge, not to create understanding.

**Nisha's case**

The second case, that of Nisha, is seen in Fig. 3. Like Shaina, Nisha had the influence of cultural practice in her learning by recitation of the *Qur'an*, coupled with her rote learning experiences in school. However, in her journey of forming an overall PATCH, her pedagogical habitus seemed dominant.

### NISHA'S Pedagogical Habitus in PATCH Framework

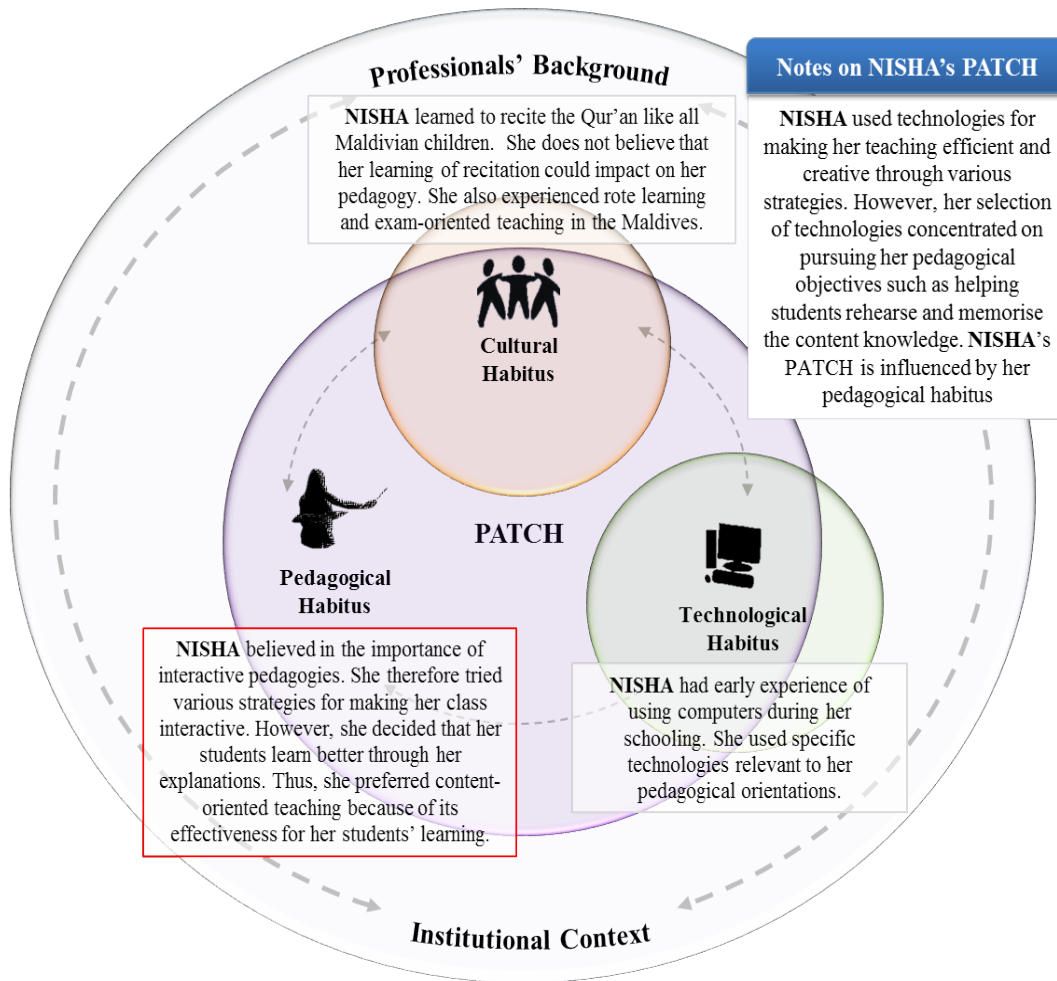


Fig. 4 Nisha's pedagogical habitus in her PATCH

Because she studied overseas (the United States and Australia), Nisha had learning experiences through various technologies during her education. When she returned to the Maldives, she tried to implement what she learned in her early teaching career. However, her pedagogical experiences brought her to the realisation that her expectations of student learning remained unmet. She felt she did not satisfy her students' expectations in her role as a teacher—nor did her students' learning meet her expectations when she taught with interactive strategies. Nisha found that her students learned little when they were given activities designed to construct their own understanding. Nisha's objectives for her lessons were achieved only when her students memorised the right answers for every question she asked. For her, the learning was defined as the storing of knowledge in her students' minds. Knowledge, for her, was content as inviolable fact.

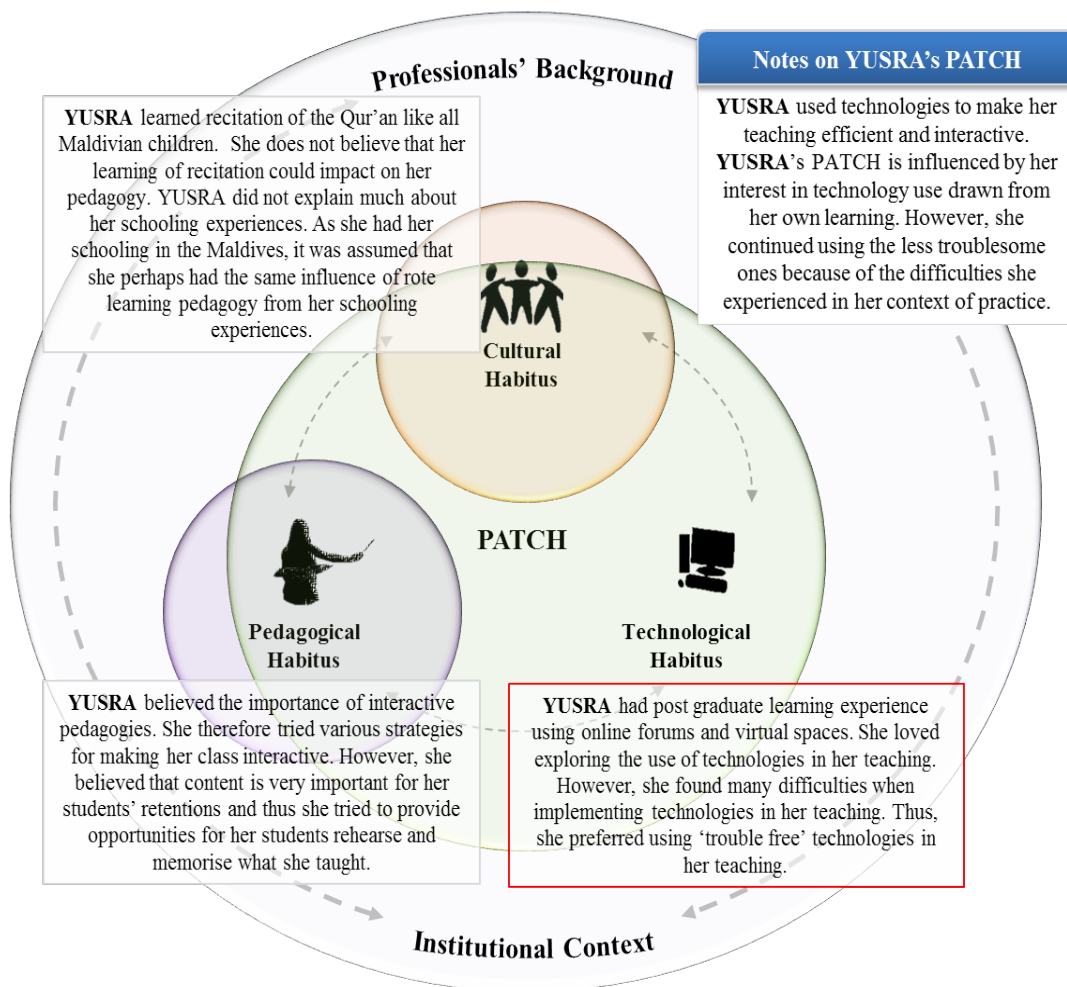
Nisha was influenced by the cultural practice of learning by recitation of the *Qur'an* without understanding. During her teaching, she put little focus on the learning process or her students' learning experience. In other words, her pedagogical practice centred on students receiving and memorising the content she taught. Therefore, the focus of her pedagogy was to deliver content. The role of her students was to store the delivered knowledge. Her pedagogical habitus was also

influenced by the context of practice in terms of teaching content-heavy modules. Cultural influences also proved too strong for theories learned elsewhere in her teaching.

### Yusra's case

The third example of PATCH can be illustrated in Yusra's case (see Fig. 5). Yusra had the same cultural learning experience as her colleagues (recitation of the *Qur'an* and rote learning experiences at an early age). However, Yusra's overseas undergraduate study allowed her to observe and experience interactive learning. During her postgraduate studies, she also experienced learning in virtual spaces. These experiences influenced her overall habitus, but the most influential habitus on her overall PATCH is the technological habitus.

**YUSRA'S Technological Habitus in PATCH Framework**



**Fig. 5** Yusra's technological habitus in her overall PATCH

At the very early stage of data collection (interview and hanging out with her), Yusra repeatedly mentioned her fascination with technological tools and facilities (specifically virtual spaces such as Moodle) and had tried some of these in her teaching. However, she faced many technical difficulties when using Moodle, Self-Service, and GEM (virtual spaces available in the institution). As a result, she frequently complained about the facilities and technical support provided in her workplace, and so relied on those that worked efficiently. However, her selection

of specific tools (such as PowerPoint) was influenced by her rote learning experience during her schooling, and the cultural practices of recitation of the *Qur'an* without understanding.

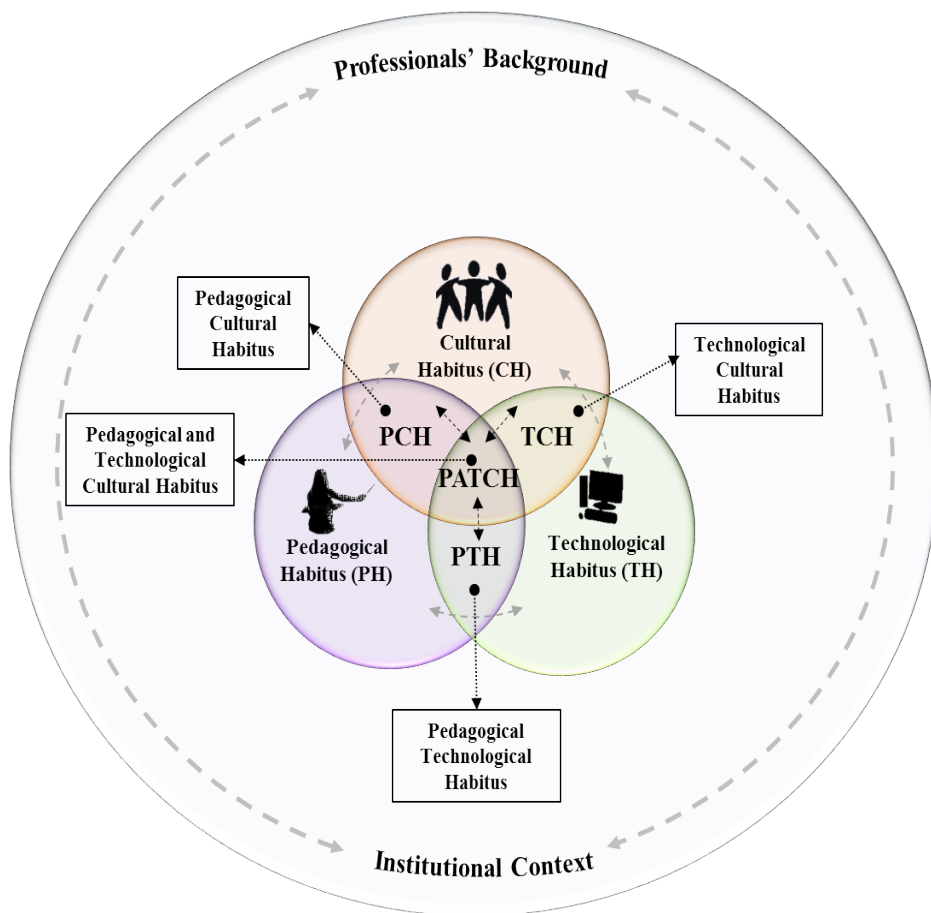
In each of the cases discussed above, a specific habitus was dominant. Figures 3–5 identify the dominant habitus and its overlap with other types of habitus. The examples demonstrate how the PATCH framework can be applied to understand and investigate types of habitus in pedagogical and technological contexts of individual cases; however, this doesn't mean a single habitus will dominate in every case.

With these findings, this study proposes a framework; namely, Pedagogical and Technological Cultural Habitus (PATCH), for understanding the connections between teachers' culture and how they use technologies for teaching.

## Discussion and conclusion

Pedagogical and Technological Cultural Habitus (PATCH) is an emerging idea developed by the author to understand teachers' existing pedagogical practices with technologies in relation to their backgrounds and culture (see Fig. 6). This model identifies two new components (the professional's background and their institutional context) as vital for explaining how teachers use technologies in teaching. The influence of teachers' own culture and their context cannot be ignored in an analysis of their pedagogical practices.

**Pedagogical and Technological Cultural Habitus (PATCH)**



**Fig. 6 Pedagogical and Technological Cultural Habitus (PATCH)**

Teachers' decisions about their pedagogical strategies are based on their understanding of what it means to teach and how technology would suit their context of practice (Barton & Berchini, 2013; Liyanage, 2012; Williams, 2006). More specifically, the literature highlights the strong relationship between pedagogy and people's culture (Cheng, Cheng, & Tang, 2010; Gay, 2010; Jenks, 1993; Kansanen, Tirri, & Meri, 2000; Kukari, 2004; Richardson, 2001; Wong, 2005). These researchers draw attention to the importance of understanding individuals' culture when explaining their pedagogical practices. It is noteworthy that although individual teacher educators in my research were different, their common culture had a strong influence on their pedagogical and technological practices. In this sense, culture can include teachers' own background (such as learning experiences), religious practices (such as learning the *Qur'an* by recitation), and the influence of the context where they teach (education system). This idea illustrates Bourdieu's (1977) argument that teachers' culture can become a strong "field" in which their individual disposition is shaped by socialisation process. This socialisation process is one in which teachers conceptualise their pedagogical practice with technologies. The facilities available (economic capital) in the teacher's workplace or their cultural upbringing (social and cultural capital) can become a large part of their formed dispositions. Literature suggests that teachers learn their practical pedagogical knowledge as they continue to teach in the context of practice (Dewey, 1904; Loughran & Northfield, 1996).

The proposed PATCH framework is pertinent for researchers' arguments about the strong connection between teachers' conceptualisation of pedagogical practice and their culture. This framework may help researchers to not only examine teachers' use of technologies in teaching, but also identify what to address and which areas to focus on when change is necessary to enhance pedagogical practices. It may also inform those who design educational professional development programmes that link pedagogy with technologies.

The PATCH framework is timely because a number of technology integration models have failed to explain the connection between technology, pedagogy, and culture. For example, TAM (Davis, 1989) and the TPACK model (Mishra & Koehler, 2006) have limited room for explaining the relationship between how teachers use technologies and their culture. None of these models helped me to understand what my participants have shown me: that early learning experiences can have a profound effect on pedagogical thinking, and those experiences also affect their choice and use of digital technologies in their classrooms.

The PATCH framework helps to fill this critical gap. The framework contributes to the field of technology integration research by explaining what happens in many pedagogical contexts where the anticipated change in response to technology use is not observed. The PATCH framework is useful for analysing teachers' past and present experiences when investigating their pedagogical and technological practice, and would help to identify which aspects need to be considered when designing teachers' professional development.

The proposed framework helps to make connections between the embodied cultural aspects of teachers' experiences and how they relate to their existing pedagogical practices of using technologies. This paper recommends using PATCH to understand specific digital technological contexts such as mobile learning, online learning, virtual spaces, and blended learning and, more specifically, contexts related to the use of iPad, iPhone, smartphone, blog, twitter, Facebook, and so on. It therefore helps researchers to explain the influence of people's backgrounds and cultures on their use of digital technologies.

## Acknowledgement

This paper was first presented at the DEANZ2016 conference at the University of Waikato where the author was presented with a Best Postgraduate Paper award. The research was also supported through The University of Waikato International Doctoral Scholarship 2012.

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Adam, A., S. (2017). A framework for seeking the connections between technology, pedagogy, and culture: A study in the Maldives. *Journal of Open, Flexible and Distance Learning*, 21(1), [35–51.].



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