Chapter 1
The Role of Early Learning Experience in Shaping Teacher Cognition and Technology Use

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EXECUTIVE SUMMARY

This chapter explores the role of teachers' early learning experiences in shaping their pedagogical beliefs and practice specifically in relation to technology use. Following a case study approach, the accounts of three in-service Arabic language teachers from a private institution of higher education in Cairo, Egypt, were examined. Practitioners with years of professional experience are not expected to have encountered elements of technology as we know today in their schooling. Nevertheless, findings suggest that conceptions formed early in life of what constitutes "good" or "bad" teaching act as filters through which new experiences, including the use of digital media, are internalized. As imprints of early learning experiences are manifested in teaching, it is the responsibility of teachers to look back on them for possible influences on their pedagogical theories. In complementary fashion, the study foregrounds the role of teacher education in mediating initial conceptualizations of teaching and learning and accentuates the value of reflective practice for continuing teacher development.

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INTRODUCTION

This chapter explores the impact of early learning experiences in shaping teachers' cognitions as reflected in their use of educational technologies. The text builds on existing literature on teacher cognition and teacher education. Research into these fields has undergone a remarkable expansion in recent years, though it has not yet sufficiently addressed the relationship between teachers' learning histories, cognitions, and technology use. Subsequent sections explore this relationship with a view to furthering our understanding of this area of inquiry.

BACKGROUND

Evidence from the literature suggests that teachers' pedagogical beliefs are highly affected by their early experiences as learners (Greene, 1984; Pajares, 1992; Johnson, 1994; Numrich, 1996; Richards & Lockhart, 1996; Windschitl, 2002; Borg, 2003, 2006, 2009; Ertmer & Ottenbreit-Leftwich, 2010; Farrell, 2009; Graves, 2009). Introduced by Lortie (1975), the term *apprenticeship of observation* refers to the lasting impact that schooling experiences have on teachers' pedagogical beliefs (p. 61). The thousands of hours that learners spend in classrooms familiarize them with the details of teaching, and initiate a process of socialization, so that those who later choose to become teachers enter the profession with preconceptions founded upon strong identifications (ibid. pp. 66-67). Through daily observation of teachers at work, perceptions of what constitutes 'good' or 'bad' teaching are internalized and, with time, reinforced. Apprenticeship of observation is, therefore, complex (Russell, 2008), highly resistant to change (Loughran, 2005; Loughran & Russell, 2007), and not to be underestimated (Bullock, 2009), as it informs the way practitioners respond to different teaching situations (Flores & Day, 2006).

Recognizing the impact of early imprints on pre-service teachers' pedagogical beliefs, Lortie (1975) argues that "the mind of the education student is not a blank awaiting inscription" (p. 66). He explains that understandings developed during apprenticeship of observation, and later carried on, are likely to be limited, mainly because learners are not privy to teachers' decision-making processes, and therefore, may not be fully aware of the intricacies and complexities of the teaching profession. Along the same lines, Darling-Hammond (2006) identifies apprenticeship of observation as one of the main challenges to teacher education, largely because teacher candidates often need to conceptualize teaching in ways that are different from their own early experiences as learners.

Research on the imprints of apprenticeship of observation has chiefly been undertaken in the context of pre-service teachers, yet the effect of past schooling experiences on teacher cognition is also evident in former studies on in-service teachers (Golombek, 1998; Numrich, 1996; Woods, 1996), as well as in research on in-service teachers' pedagogical theories about technology integration. For example, Ertmer (2005) argues that since only a few teachers witnessed the use of technology, as we know it today, in the early years of their schooling, they may not hold preconceptions about how it is used to support student learning. Nevertheless, she adds that their use of new educational tools will be filtered through established beliefs about teaching and learning, and in this respect, teachers' perceptions of Information and Communication Technology (ICT) will not differ greatly from their perceptions of other teaching resources or methodologies. Lim and Chai (2008) present a similar argument in the context of their research on schoolteachers in Singapore. They explain that since the construction of teachers' pedagogical beliefs begins early in life, teachers who went through "traditional" schooling may hold beliefs that reflect elements of this kind of education, and only discern affordances that are congruent with these beliefs.

That apprenticeship of observation is supported by a myriad of studies does not mean that it has escaped criticism. Mewborn and Tyminski (2006) argue that Lortie makes "a rather grand claim" about the way the teaching practice is transmitted (p. 30). In their opinion, this socialization model is not sufficiently robust and has repeatedly been used to account for substandard teaching and the ineffectiveness of teacher education programs. The researchers conclude that if this model is to be credible it should also examine how quality teaching is reproduced, how some teachers transform unfortunate schooling experiences into favorable ones, and how the cycle of bad teaching can be broken.

THE RELATIONSHIP BETWEEN EARLY LEARNING EXPERIENCE, TEACHER COGNITION, AND TECHNOLOGY USE

Exploring the Relationship: Research Design and Methodology

The following sheds light on the research questions, describes the context, introduces the participants, and addresses the methodology employed in this study.

The research questions that guided this investigation were:

Is it possible to identify a relationship between teachers' early learning experiences, their cognitions, and their technology use? If so, what is the nature of such a relationship?

I situated the study within a qualitative research paradigm, and chose a case-study design for it, which allowed me to capture the subtleties and complexities of teachers' thought processes, to examine the particularity of individual practitioners' experiences, and to gain an in-depth understanding of the contextual details involved.

The site of this study is a private institution of higher education in Cairo, Egypt, which hosts one of the largest programs for teaching Arabic to speakers of other languages (TASOL) in the world. At the time of data collection, the program employed 32 full-time and 36 part-time teachers. The selected participants were three Arabic language teachers who used ICT to varying degrees in their practice. All three teachers are female, as 84% of in-service teachers on the program were female.

My three participants are Dalal, Heba and Laila[1]. The first teacher, Dalal, has a BA in Economics, an MA in Teaching Arabic as a Foreign Language (TAFL), and a PhD in methods of language teaching. She has been teaching Arabic for 22 years. Dalal was chosen for this study due to her recent efforts to incorporate ICT into her teaching and to develop digital learning material, especially for her Arabic poetry and prose classes. Heba holds a BA in Media and Mass Communication, an MA in TAFL and has been teaching Arabic for 15 years. She was one of the early adopters of digital learning materials in the language program, with a particular interest in the area of listening. Laila has a BA in Arabic Studies, an MA in TAFL, and has worked as an Arabic language teacher for 30 years. She was one of the first teachers to join the program and has thereby witnessed the entire trajectory of technology integration in her workplace.

In this study, methods of data collection included semi-structured interviews, in-class observation, video-recorded stimulated recall, and reflective writing. Information about the relationship between learning history, pedagogical beliefs, and technology use was collected as part of a larger study on teacher cognition and ICT, which involved a nine-month fieldwork period. All data collection took place in Arabic, but subsequent analysis was undertaken in English, mainly due to specific language limitations in the qualitative analysis software used. Following Stake (1995), an inductive approach to case study analysis was adopted whereby data was examined in small segments and categories were identified. Corresponding information was subsequently re-classified under broader conceptual themes, which together formed the backbone of the teachers' case profiles. Prolonged stay in the field, triangulation, and respondent validation were all measures adopted to establish rigor in the research process.

Articulating the Relationship: Teacher Profiles

With each theme identified in the analysis, new understandings emerged which helped build up a picture of the relationship between previous learning experiences, teacher cognition, and technology use for each participant. The following section presents the case profiles for the three teachers.

Case Study: Dalal

When Dalal was in Year Two at school her parents relocated the family to the United States to study. By that time she had already started learning English in Egypt, mostly in the form of independent items of vocabulary. In the United States, she used to play with the little girl next door, and through daily communication with the child she slowly became more confident and competent in English. This successful experience of language learning motivated her to adopt communicative techniques in her practice.

I was communicating with her [the little girl] with ease. I didn't notice that anything had changed. I am therefore attracted to the communicative approach… and try as much as possible to implement it in my teaching. I always think: How will they [her learners] benefit if I give them such and such?... If there are specific activities that they enjoy and that will later be of use to them in their daily lives, this is probably best. (Interview)

Following a communicative approach, Dalal does not place major emphasis on error correction when her learners speak in Arabic, but rather encourages them to express themselves and draw on their own experiences. She helps them become confident producers of the language, and employs educational technologies to this end. The following note from classroom observation sheds light on her theory of teaching.

She [Dalal] starts the lesson by asking the students whether they like shopping for curios, if they have been to Khan el Khalili [a well-known traditional bazaar in Cairo], and whether they can describe the characteristics of this particular bazaar. Her students talk while she writes down new vocabulary on a sheet of paper, and displays it on the interactive white board using the document camera. (Field notes)

When she was at school in the United States, Dalal read numerous stories, learned silent reading, and worked on several group projects, all of which she identifies as positive aspects of her early language learning experience. Elements of this pedagogical practice are integral to her teaching, with or without the use of digital media, and her preference for collaborative student activities is one example.

I always try to think of group projects that students can work on together, in a way that is useful to their learning. (Interview)

After two years in the United States, the family returned to Egypt. Dalal could neither read nor write Arabic, and struggled to learn the language, mainly due to the teaching methods prevalent in Egyptian schools at the time. This has influenced the way she teaches now, as she tries to avoid the elements she disliked then, such as rote learning, protracted reading out loud sessions, and dry grammar classes.

For me, Arabic was a huge obstacle. I, therefore, want to teach it the simple way. I don't like to complicate things. It [her experience] made me think: How can I facilitate learning this language? (Interview)

Dalal's appreciation of the potential to create visual resources offered by digital media is reflected in her design of computer-based language tasks that involve drawing, tables, photos, or animation. The following exemplifies her use of visual tools in grammar teaching.

[Using] PowerPoint with weak verbs, the prefix enters from one side [of the slide] and the suffix from the other. The students notice this. With regards to grammatical explanation, this facilitates things for the teacher and for the students, especially if it involves colors… highlights, and the like. (Reflective writing)

In spite of her unfavorable experiences of learning Arabic at school, Dalal pursued a career in language teaching. She attributes this to two main factors: her mother, who was also a TASOL teacher, and teacher education. Dalal used to help her mother record listening material, and was excited to see the new textbook she had written being published. Later, Dalal's mother encouraged her to observe classes, and supported her decision to pursue an MA and a PhD in this area.

She used to come home [from work] and tell us: "Today I gave the kids this and that… and for the first time, they were able to do this and that." My brother and I used to help her audio record her lessons, and sometimes we couldn't help laugh-

ing in the middle of the process (laughs). So, Mum had a profound effect on me. I used to tell her: "I will not be [a teacher] like you," and I became just like her (laughs)! (Interview)

As for teacher education, Dalal confirms that it had a significant impact on her teaching. The Arabic grammar courses that she took as part of her training were in complete contrast to the lessons she had at school.

My view of grammar changed totally. Throughout my life, grammar had been incomprehensible. So, how did I grasp it so easily? I wanted to improve as a teacher, was happy in the field, had a passion for learning, and the way things were taught stimulated thinking… This or that? Why this? Why not that? (Interview)

Dalal's account demonstrates that both positive and negative schooling experiences contribute to shaping pedagogical beliefs about teaching and learning. Further, her profile shows that the effect of former learning experiences extends beyond apprenticeship of observation in classrooms to cover the imprints of parents and the wider social network. We also understand that a transformation of preconceived ideas, which had been developed during schooling years, can take place due to the subsequent influence of family members and teacher education.

Case Study: Heba

Ever since she was in Kindergarten, Heba used to go home and emulate her teachers, suggesting early cultural transmission of the role of a teacher.

When I was very young, I had an English language teacher… and I remember I used to go home and imitate her way of teaching. I grew up and this habit grew with me. I used to like imitating teachers. (Interview)

Heba used to repeat what she had learned in school to her nanny, which her mother thought was a good way for Heba to review her lessons. She therefore encouraged this behavior by providing her with a blackboard. Heba's preference for learning through observation, modeling, and practice remained with her. Recalling her pre-service teacher education years, she affirms that observing other teachers in their classrooms was remarkably beneficial.

The thing that benefitted me the most was going into classes, observing others, and taking notes. (Interview)

In relation to advancing her use of digital media, Heba expressed a need for time to observe the use of educational technologies in different teaching contexts, and to learn through experimentation.

If only I could get partial study release to go and attend classes, listen, attend extramural events and observe new methods being put into practice or even travel. (Interview)

Heba had traditional Egyptian education. She remembers that, although the level of English language teaching was declining in her school, as a child she still admired her English language teacher and saw differences between her and her Arabic language counterpart. The former used to wear a T-shirt and a pair of jeans, was approachable and engaging, and her teaching involved songs and games. This was in contrast to the Arabic language teacher who used to wear a suit, kept a distance, and upheld formality. Because Heba was tall, she used to sit at the back of the class. The distance was therefore literal, as the teacher only came closer during a dictation or a test.

Upon observing Heba's classes, we notice that she is both approachable and engaging. She designs activities that enable learners to become producers of digital media rather than merely consumers of it. For example, she assigns language projects based on Windows Movie Maker, and encourages learners to video record aspects of their daily lives, present them in class, and discuss them with colleagues.

It's the feeling that they have produced something themselves. When a presentation is developed with a recording of the student's voice accompanying the pictures, and it is presented as a final project, this has the most beautiful effect... The student completes the course with a product in his/her hands, a product that s/he has presented to all the other students in class. (Interview)

Heba recalls being at the top-end of her class in Arabic. She did not dislike grammar, and was often asked to read out loud to the rest of the class. She grew up with prevailing images of transmissionist teachers, and with a firm understanding that teachers speak and students listen. This perception of the role of the teacher was reinforced over the years as she was often commended for being "quiet and obedient." These beliefs were challenged several years later when she started on the teacher education program. It introduced her to new pedagogical understandings and to the experiences of her colleagues. She also benefitted immensely from observing the tutor of that course teach.

All these concepts I learned from the methods courses. These things were new to me… to know that, as a teacher, my role should be an ancillary one. (Interview)

The notable change in Heba's beliefs in relation to the role of the teacher is reflected in her own teaching practice, including the use of educational technologies. She encourages her students to take responsibility for their own learning and provides opportunities for them to experiment with different tools. Heba confirms that her role is to assist learners to become more independent.

I think they [the learners] have to understand that they shoulder the bigger burden. In other words, they are responsible for their own learning. I will give them things that will help them, but in essence, the work is theirs. (Interview)

Heba's childhood preference for learning through observation, modeling and experimentation remained with her, and it is one of her preferred methods for broadening her knowledge of ICT. Her profile also demonstrates that teachers may adopt those elements that, during their childhood, they perceived as positive examples of teaching, and avoid the negative ones. The role of parents in reinforcing certain behavior is apparent in Heba's account, and the remarkable impact of teacher education in transforming pedagogical beliefs cannot be underestimated.

Case Study: Laila

Laila's memories of Arabic language learning date back to her pre-school years, when her father, who was an academic in the field of Media and Mass Communication, used to sit and practice the Arabic alphabet with her. This gave her a good head start when she went to school.

[One day] the teacher asked: Who can write his/her name? I went up to the board and wrote mine. I still remember doing that. Wow [I thought]!... "Give her a hand!" [the teacher said] (laughs). These are my memories of Arabic… I didn't progress at the same level of excellence because the language curriculum had many shortcomings. I was ok. Average, but I can't claim that Arabic was my favorite subject or that I liked it, especially not syntax. (Interview)

Laila believes that Arabic language teaching in Egyptian schools suffers serious limitations. For example, grammar lessons focus on both common and rare structures, introduce archaisms, and are far from being practical. Laila's negative experiences during her apprenticeship of observation exert a powerful influence on the way she teaches Arabic now, as she wishes to offer her students meaningful and enjoyable opportunities for learning.

I think I mentioned this before: Teachers' negative experiences as learners encourage them to do the exact opposite [in their own practice]. For example, my experience of Arabic language curricula in schools, and the teacher-student relationship generally, has led me to do the opposite [of what my teachers did]. (Interview)

To ensure her learners have a markedly different educational experience from her own, Laila uses ICT. She believes in the vast potential of educational technologies for enhancing Arabic language teaching; for example, both teachers and learners now have unlimited access to up-to-date language resources such as news Websites, video footage, and social media. Further, using computer animation in grammar sessions facilitates the teaching of language structures, raises learner motivation levels, and helps them to understand the rules.

Students are more enthusiastic about the subject matter. "We are going to watch a movie today" [they say when she puts up her PowerPoint presentations]. We switch off the lights and I feel happy to see grammar becoming more appealing… It has always been boring and monotonous. So, when it is transformed into an element which stirs up the students' enthusiasm, it's wonderful. (Interview)

Curious to see these 'movies' for myself, I observed a few of Laila's meticulously-developed presentations. The following description of one of her grammar lessons reflects the effort she puts into designing them:

She moves through the slides, and talks about the characteristics of the present tense in Arabic using animated words. The verb is presented in a rectangular textbox and the prefixes in hexagrams. As she clicks, examples of verbs and their prefixes then move from the boxes to the center of the screen, indicating their association. Hereafter, full sentences enter slowly from the bottom of the screen, and the tense sweeps in at the end in a different color. Laila presents more detailed slides on prefixes, in which each one is connected to relevant examples using arrows. (Field notes)

Despite her negative experience of learning Arabic, Laila chose Arabic Studies for her BA and later completed an MA in TAFL. She had learned that the content of university Arabic courses was very different from what was taught in schools, and enjoyed the course on novels and short stories in particular. It changed her perception of the Arabic language completely.

It made me like Arabic as a language very much. This is a form of Arabic that is different from school Arabic. (Interview)

Laila's positive experience at university inspired her to pursue a career as an Arabic language teacher. She enrolled on the teacher education program, and used to sit in on classes and observe more senior teachers' practice. At that time, the only manifestations of technology were reel-to-reel tapes, manual typewriters and one listening lab. So, how can we account for her use of digital media today? Laila explains that the teacher education program equipped her with conceptual understandings of various aspects of TASOL which, since then, have acted as a filter through which she internalizes her practice. At different junctures of Laila's long professional journey, she has shown active commitment to harnessing educational opportunities offered by newly available tools to improve her teaching. Unsurprisingly, her determination to strive for self-development is a salient theme in her data.

Regardless of any technology-related frustrations that arise for different reasons, I don't think I can do without its tools now, after getting this far, and experiencing their benefits and the pleasure of using them. The hands of a clock never move backwards and, God willing, neither will my journey. (Reflective writing)

Laila's profile presents an example of how negative perceptions formed during early schooling years can be transformed into positive teaching practice. It also shows that certain educational experiences (e.g., in higher education) can outweigh the impact of earlier ones (e.g., at school) in shaping teacher cognition, although elements of the latter may endure. The theoretical understandings developed during teacher education may also have a lasting effect on teachers and constitute a lens through which they internalize their practice. Furthermore, the initial, yet profound, contribution of parents in shaping their children's conceptions about learning and teaching is worth noting.

Understanding the Relationship: Findings and Discussion

Findings in this study concur with a considerable volume of literature, which acknowledges the lasting imprint of early experiences on teacher cognition (Pajares, 1992; Johnson, 1994; Richards & Lockhart, 1996; Windschitl, 2002; Borg, 2003, 2006, 2009; Darling-Hammond, 2006; Loughran & Russell, 2007; Russell, 2008; Bullock, 2009; Farrell, 2009; Graves, 2009; Ertmer & Ottenbreit-Leftwich, 2010).

Given the three teachers' extensive backgrounds in teaching, it is unlikely that they would have observed any use of technology as we know it today in their school years. Nevertheless, their accounts demonstrate that deeply engraved positive and negative experiences guide their approaches to the integration of ICT in their teaching. For example, admiration of a schoolteacher's 'learning by doing' style inspires activities designed to engage students using Windows Movie Maker (see Heba's profile). Simi-

larly, aversion to obscure grammatical rules, archaism, protracted reading out loud sessions, and rote learning, lead to a purposeful utilization of technological tools for meaningful and enjoyable language learning (see Dalal and Laila's profiles).

In this respect, early mental images of teaching and learning constitute filters through which subsequent professional experiences are internalized. This corroborates earlier research (Ertmer, 2005), which suggests that since many current teachers are unlikely to have been exposed to ICT in their K-12 years, the way they perceive the usefulness of these tools will largely depend on established cognitions. In this regard, "teachers are likely to think about technology in the same way they think about other teaching methods, tools, or reform initiatives, depending on if or how they classify technology into one of these categories" (p. 30). The present study therefore supports earlier international research, which argues that teachers use ICT in ways that are congruent with their own pedagogical theories (Veen 1993; Lam, 2000; Gobbo & Girardi, 2001; Niederhauser & Stoddart, 2001; Zhong & Shen, 2002; Demetriadis et al., 2003; Tondeur et al., 2008; Tondeur et al., 2013). Furthermore, since the learning histories of individual teachers are invariably different, the impact on their cognitions will be different and so will their technology use. This may explain why teachers working in the same institution exhibit varied levels of ICT integration.

In all three participant accounts, although depictions vary, there is evidence of the very early role played by influential adults (e.g., parents) and wider social connections (e.g., neighbors) in shaping emerging cognitions about language learning. For example, Dalal adopts a communicative approach in her classroom as this is the way she enjoyed learning English as a child. Furthermore, her mother's influence was highly significant in shaping her beliefs about the profession. Similarly, Heba's mother and Laila's father both contributed to their children's experiences of language learning.

This study also suggests that subsequent educational experiences at university can transform earlier beliefs about learning and teaching furnished during apprenticeship of observation. As a child, Laila disliked Arabic language lessons. However, the years of study at degree level changed her perception of Arabic drastically, paving the way for a long and successful career in TASOL.

Findings of this research also address the relationship between teacher cognition and teacher education, on which different views have been expressed. Whereas a number of studies have shown that beliefs constructed early in life may outweigh the impact of teacher education in shaping classroom practice (Lortie, 1975; Nespor, 1987; Pajares, 1992; Johnson, 1994; Phipps & Borg, 2007; Belland, 2009), others have demonstrated that teacher education can play a cardinal role in mediating teacher cognition (Freeman, 1991, 1993; Slaouti & Motteram, 2006; Ertmer & Ottenbreit-Leftwich, 2010).

This study substantiates the latter position. Dalal, Heba and Laila joined the same TAFL teacher education program at different stages in its history and attest to its powerful effect in reconstructing beliefs about Arabic language teaching and learning furnished during apprenticeship of observation. Neither their early schooling, nor their teacher education incorporated elements of digital media as we know it today, yet the TAFL program equipped the three teachers with conceptual understandings supported by models of situated practice, which guided their subsequent teaching. For example, the program helped transform deep-rooted childhood conceptions about the role of the teacher (Heba's profile), and about methods of teaching Arabic grammar (Dalal's profile).

CONTRIBUTIONS

This research makes particular contributions to the areas of pre-service teacher education and in-service professional development.

Recognizing that prospective teachers do not enter the profession as blank slates, and in light of the significant role that teacher education can play in transforming established beliefs, it is essential to encourage pre-service teachers to 'unpack' earlier experiences and become more aware of major influences on their cognitions. To be aware is to become responsible. What has been inscribed on the child will find its expression, but how it is expressed becomes the responsibility of the adult. Further, drawing on the findings of this study and established research in the field, it is important to alert teachers to the likely impact of their daily practice on future generations of teachers and, by implication, on the overall profession.

Bailey et al. (1996) explain that this engagement in processes of introspection is key to continuing professional development for it equips prospective teachers with the skills to become reflective practitioners. The researchers add that, through analyzing their beliefs about the schoolteachers they have observed, pre-service teachers can begin to construct their own pedagogical theories, become more intentional in their actions, and identify for themselves their own professional development priorities. We may, therefore, conclude that integrating reflective processes into teacher education programs is demonstrably empowering.

Similarly, though educational technologies are fast-developing, this does not mean that in-service teachers' use of them is not affected by apprenticeship of observation. They are, therefore, invited to reflect on the influences on their pedagogical beliefs, and become more aware of what happens in their classrooms and why. Such exploration helps experienced teachers identify areas of strength and weakness, become more intentional in their actions, and take responsibility for their own professional development, both in general terms and with specific regard to the use of technology.

Edge (1999) maintains that "development comprises two essential characteristics, awareness and direction: awareness of where one is, and movement in a direction which one has identified as desirable" (p. 40). He argues that it is important for teachers to reflect on where they stand to be able to determine where they would like to be, and explains that "development can only start from where we actually are" (p.41). In light of these insights, this study suggests that developing an awareness of where one is necessitates an understanding of how one got to that point in the first place. Exploring teachers' formative experiences as learners is therefore key to their trajectories of development.

In the same vein, Burns (1992) underlines the importance of "the critical exploration of 'what is' in order to reflect on 'what might be'" (p. 64). Considering the profound impact of teachers' educational backgrounds, we may add a 'what was' to Burns' 'what is' and 'what might be'.

Furthermore, because every teacher has a unique story to tell about their past, explicating individual teachers' cognitions about technology use implies necessarily variant pathways to professional development in ICT, where, to borrow Greene's (1984) description, "There will be diverse individuals in diverse contexts, engaging in continually new beginnings as they work to make sense of their worlds" (p. 62). In light of this singularity of teacher journeys, external notions of 'best practice' need to be substituted with an understanding of effective teaching as "the individually determined best-next-step for each teacher" (Edge & Richards, 1998, p. 571). In this respect, 'best practice' is continuously developing with no specific end-point. We may therefore argue that the most successful ICT integration is that which emerges from individual teachers' constant examination of their practice and continued commitment to improving it.

SCOPE FOR FUTURE RESEARCH

Following on from this study, several areas for future research can be identified.

- Conceptually, this study supports the broadening of common understandings of apprenticeship of observation to emphasize the influences of positive as well as negative learning experiences, and to investigate the different ways in which poor schooling may induce positive pedagogical action. In this respect, the focus of future research on apprenticeship of observation should be expanded from merely 'breaking cycles' to include 'building bridges'. Similarly, our understanding of *early learning experience*s needs to extend beyond the impact of schoolteachers in classrooms to encompass the role of influential adults, and wider social networks.

- The relationship between teachers' early experiences as learners and their current use of ICT merits further investigation, especially with regard to the impact of pre-established beliefs on which forms of technology are used, how they are used, and for what purpose. In this regard, studies documenting teachers' constantly developing pedagogical theories will advance our knowledge of the relationship between early learning experiences, teacher cognition, and ICT integration.
- More generally, as this study investigates processes of change in in-service teachers' beliefs, and since existing research on such processes is relatively limited, longitudinal studies are required in this area (Borg, 2009).
- As demonstrated in this research, teacher education can play a significant role in challenging initial conceptualizations about teaching and learning. There is clearly scope for continuing research to elucidate processes of 'unpacking' teachers' preconceptions and ways of supporting them as they construct or revisit their own teaching philosophies. Related to this is the need for further work on what support teacher educators need to foster enquiry, criticality, and reflectiveness, and more importantly to embody these values in their own teaching practice (Bullock, 2009).
- With respect to the contexts in which research has been conducted to date, there is scope for expansion. This study was carried out in a private institution of higher education in Egypt. Replicating the study in other geographical contexts, both in public and private sites of learning, will offer broader insight into the cultural transmission of pedagogical practices. Similarly, as much of the existing work on teacher cognition has been conducted in pre-service teacher education contexts, there remain gaps in our understanding of in-service teachers' cognitions, for beginning and more seasoned teachers (Borg, 2009). Further detailed research is needed to elucidate the impact of formative experiences on shaping in-service teachers' beliefs, along the lines of Johnson (1994), Bailey et al. (1996), and Mewborn & Tyminski's (2006) work on pre-service teachers.
- Given the scope of this study, it was not possible to investigate the likely influence on the findings of factors such as the number of participants, their age, gender, or the socio-economic level of the schools they had attended. Such correlations could be explored in future research into this area.

CONCLUSION

Situated in the fields of teacher cognition and teacher education, this chapter aimed to investigate the relationship between teachers' early experiences as learners, cog-

nitions, and technology use in the context of TASOL. Findings suggest that even in the absence of ICT in the early years of schooling, positive and negative educational encounters during schooling have a lasting impact on teacher cognition and practice including the use of educational technologies. Although early cognitions about learning and teaching are largely developed in classrooms, they may also be constructed externally through the influence of parents and social networks. Further, education beyond K-12 may override earlier preconceptions about language teaching, and teacher education can play a prime role in mediating the impact of early learning experiences.

For teachers to know where they are and where they are headed in their continuing professional development they need to be as clear as possible about where they have come from. Since early learning experiences find their expression in practice, 'unpacking' these experiences becomes key to practitioner development. Teacher education can play a major role in this regard by offering conceptual spaces to both pre-service and in-service teachers to allow them to reflect on their former learning experiences for more purposeful development of their own teaching theories. It should be noted that early learning experiences are deeply engraved and do impact pedagogical beliefs and practice, but the way in which they find expression, because of this awareness-raising process, becomes the responsibility of the teacher.

Finally, the text remains open to the various personal resonances that it may evoke, with the hope that it will expand horizons, and open up new vistas for further research in this area.

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ADDITIONAL READING

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KEY TERMS AND DEFINITIONS

Apprenticeship of Observation: Coined by Lortie (1975), the term refers to the thousands of hours that learners spend in classrooms observing teachers at work, which familiarize them with different aspects of teaching, so that those who later become teachers enter the profession with established preconceptions grounded in firm identifications.

Early Learning Experience: Pre-schooling and schooling experiences of structured learning. Such experiences cover the early impact of influential adults and social networks.

Reflective Practice: A critical examination of specific experiences with the purpose of gaining deeper awareness of and insights into where one is and where one would like to be. The concept can therefore be demanding, transforming, and empowering. Schön (1983) distinguishes between reflection-in-action which is more the thinking on your feet, and reflection-on-action, where individuals look back on their practice.

Teacher Cognition: Due to the difficulty of drawing clear lines between mental constructs such as beliefs, attitudes, and knowledge, 'teacher cognition' is used as an inclusive term to embrace the complexity of teachers' mental lives.

Teacher Development: A continuous process of personal and professional growth which involves a deep understanding of oneself as a teacher, and the direction in which one wishes to progress. Reflecting on one's teaching, articulating experience, and collaborating with colleagues are common strategies for facilitating teacher development.

Teacher Education: A structured program for teacher learning which involves reconstruction of knowledge, exploration of thought processes, and focused reflection on experience.

Technology Use: The way in which teachers choose to employ digital media in their day-to-day teaching.

ENDNOTES

[1] After data collection was complete, we - the participants and myself - agreed to use their real names in this study as a way of acknowledging their personal contribution to this work and to celebrate their continuing professional development. Since then, the teachers have moved forward in their practice. In this regard, the accounts presented here constitute snapshots of experience in their ongoing journeys of becoming.