Personal Landscapes of Teacher Professional Identities versus Digital Technology Adoption and Integration in Lesotho Schools

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Abstract. This paper reports the findings of a study which investigated how personal landscapes of teacher professional identity influence their perceptions to integrate digital technologies in classroom practices in Lesotho. The major concerns addressed by this study were: (1) how teachers view the conditions of digital technologies in personal lives; (2) how they adopt and integrate digital technologies in their classrooms; and (3) how their perceptions on the conditions of digital technologies in their personal lives influence their (teachers) views on the adoption and integration of digital technologies in Lesotho classrooms. The study used a quantitative survey to investigate 159 student teachers who were upgrading from college teaching diploma to university undergraduate degree at the National University of Lesotho. The study establishes that teachers view the conditions of digital technologies and their uses in the private lives as limited. They lack digital knowledge and skills to transfer to the classroom for digital technology adoption and integration.

Keywords: Professional identity, personal landscapes, digital technologies, technology adoption, Technology integration.

1. Introduction

This study investigated how the landscapes of professional identity influence teachers to adopt and integrate digital technologies in Lesotho schools. Digital technologies have become very important in the everyday social and economic activities of modern communities (Deb, 2014). Hence, the labour market now needs a working force that has digital knowledge and skills which use sophisticated devices for business and services. Therefore, because the main goal of schools and learning institutions is to develop the learners' knowledge and

skills for the labour markets, it has become imperative that they reform and respond quickly to the emerging digital knowledge and skills need.

2. Background

Several studies have established that teachers play a key role in the success of school reforms and changes, particularly those that affect teaching and learning (cf. Jeevan and Townsend, 2013). This is not surprising because in the classroom, the teachers are the ultimate decision-makers of what to teach, when to teach it, and how it should be taught. They formulate lesson objectives, they choose and use content which helps them achieve their lesson objectives, and they choose and integrate resources to support their lessons as they see fit (The Alberta Teachers Association, 2017). Teachers can or cannot choose to adopt and integrate digital technologies in their lessons for reasons which may or may not be teacher related (Buabeng-Andoh, 2012; Dede, 2008; Riel & Becker, 2008). Non-teacher related factors include the internal and external conditions in the schools and their local communities (Visscher, 1999). Examples of such conditions include established national and school policies, the status of technology infrastructure, and facilities and resources availability. Teacher-related factors are teachers' personal and professional qualities such as skill and knowledge, gender, age, perceptions, beliefs, or views.

Agbo (2015) and Sato and Kleinsasser (2004) are of the view that teacher and non-teacher- related factors are interrelated and form a complex web which, if not addressed in its totality, could lead to misinterpretation and contradictions about teachers and their classroom practices. This view has been supported by Spanneberg (2001) who points out that teachers' perceptions of their professional role are influenced by, among other things, the assumptions they hold about their learners and, more importantly, their assumptions about the perceptions that exist in the local communities about teachers' professional roles and responsibilities in teaching and learning. Cooney, Shealy and Arvold (1998) suggest, therefore, that it is important to understand the beliefs of teachers, and how their beliefs are structured and translated into classroom practices. According to Sato and Kleinsasser (2004) and Spanneberg (2001), failure to understand teachers' beliefs and how they are structured could lead to the misinterpretation of teachers' professional behaviour, which in turn usually leads to misinformed conclusions about teachers' professional behaviour. The lack of understanding of how the beliefs of teachers are structured and how they relate to their personal, situational, and contextual environments has already led to some studies blaming teachers for being resistant to change and being stuck in their old habits of teaching (see Wadmany, 2011; Newhouse, 1998). It follows from the preceding discussion that much of the accusations that are leveled against teachers may have resulted from ignorance about the interrelatedness of sets of factors that influence teachers' perceptions.

Other studies such as Spanneberg (2001), Levin (1995) and Veen (1993), which investigated teachers and classroom practices, suggest that research on teachers' professional practices should not isolate factors which influence teachers' perceptions; rather the interrelatedness of these factors should be maintained

during teacher investigation so that there is a comprehensive explanation of teachers' views and their practices.

2.1   Research and teacher professional identity

There has been a shift on how teachers and the factors that influence teachers' perceptions are investigated. They are now explored within the framework of their professional identities (Canrinus, Helms-Lorenz, & Beijaard, 2012; Beijaard, Veloop, & Vermunt, 2000; Barty, 2004; Sachs, 2001). Investigating a teacher within the framework of professional identity is a comprehensive approach because it enables researchers to investigate a wide range of factors and their interrelationships. As Beijaard et al. (2000) points out:

> It is important to research how teachers perceive themselves, i.e., their professional identity, their perceptions, plus the influencing factors mentioned above [teaching experiences, teaching contexts and biographies] as well as predispositions that strongly influence their judgments and behaviour (p.762).

This approach views a teacher as an individual person as well as a member of the professional and social communities. It is generally believed that studies that take this approach provide a comprehensive and better understanding of how teachers perceive their profession and what shapes their perceptions.

2.2   Teacher professional identity

Since the design and development of the research questions, selection of research methods and the design of the research instruments in this study are based on the concept of teacher professional identity, it is important to provide a brief definition of this concept. Teacher professional identity refers to a set of views which teachers hold about themselves as professionals (Beijaard, Meijer, & Verloop, 2004). They are formed and shaped by many aspects found in the teachers' private lives, in the schools in which they work, and in the communities in which teachers live and the schools are situated (Chere-Masopha & Bennett, 2007). In their explanation, Chere-Masopha and Bennett (2007) point out that the formation of teacher professional identity starts way back in the early years of teachers' lives, even before they start schooling, with critical stages in the formation of teacher professional identity being: 'before and during schooling', 'pre-service training', and 'practising'. How teachers are exposed to teaching as a profession at these stages is crucial for the formation of their individual views about who teachers are and what teaching is. As teachers go through these stages and acquire new experiences, skills, and knowledge their views change. This view is supported by Meijer, Verloop, and Beijaard (2002), who suggest that professional identity is an ongoing process of interpretation and re-interpretation of experiences, a notion that corresponds with the idea that teacher development never stops and can be best seen as a process of lifelong learning.

2.3 Landscapes of teacher identity

As observed by Chere-Masopha (2011), the landscape of teacher professional identity was first used by Meijer, Verloop and Beijaard (2002). However, Chere-Masopha extended its description to include personal, situational, and contextual landscapes. According to her, a landscape of professional identity is a metaphorical concept which refers to three sets of aspects of teacher identity. The first set relates to a teacher as an individual and private person who is a member of a teaching profession. This set of aspect forms a personal landscape of teacher professional identity. The second set comprises aspects which describe a teacher as a member of a school community in which she or he works and member of a teaching professional community. This set of aspect forms a situational landscape of teacher professional identity. The last set of aspects of teacher professional landscape describes a teacher as a member of the socioeconomic and cultural communities which form an external environment of a school and the communities in which a teacher lives, and this is a contextual landscape of professional identity.

Each of these landscapes comprises a unique set of aspects which contribute to the development and shaping of teachers' interpretation of who they are and what they should be doing as professionals. For example, as an individual, a teacher may train on how to use computers to improve his or her personal knowledge in this area. This new knowledge may influence a view of this teacher about the importance of the learners' acquisition and transference of this knowledge into the classroom for the benefit of the learners – the influence of personal landscape. Similarly, a school can improve its infrastructure and make resources available and accessible to teachers to enable them to implement change – the influence of situational landscape; or teachers may be influenced in their teaching by the views in the local communities relating to how their children should be taught - the influence of contextual landscape. These landscapes of teacher professional identity act as the templates or frameworks which inform teachers in their decision relating to teaching and learning. This paper reports on the influence of personal landscape of professional identity on teachers' decision to integrate digital technologies in their classrooms.

3.3 Personal landscape of teacher professional identity

Aspects of the personal landscape of teacher professional identity include teachers' biological traits such as gender and age, individual experiences such as their school education, and historical accounts of their training and formal preparation (Gardner, 1995; Goodson & Cole, 1994). These aspects also include lay theories which are based on who teachers have associated with in their personal and professional lives, apprenticeship of observation and atypical episodes that they encounter in their teaching (Sugrue, 1997).

The influence of the personal landscape of teacher identity on teachers' professional practice has been established by studies such as those of Rousseau (2004), Sato and Keinsasser (2004), and Beijaard et al. (2000). These studies have established that teachers' personal landscapes are responsible for how teachers view teaching as a profession and teachers as professionals. Barty (2004: p.1)

emphasizes the important of a teacher's individuality. According to Barty, the individuality of every teacher impacts the teacher's philosophical belief and the pedagogical approaches that the teacher uses in the classroom. Other studies have also established how aspects of personal landscapes of teacher professional identity influence teachers' professional practices:

Gender: Mahdi and Al-Dera Sa'ad's (2013) study established that sometimes gender could be influencial on teachers' classroom practices. Their results found out that the frequency with which female teachers made use of digital technologies in teaching and learning was less than that of their male counterparts. In some cases, gender may not be as influential as other personal aspects of a teacher. For Example, in Kurga's (2014) study gender had no considerable influence on teachers' attitude towards the integrated E-learning approach as both male and female teachers had a positive attitude towards the approach.

Age: Similar to gender, age may be influential in some cases but not in others. Mahdi and Al-Dera Sa'ad (2013) and Jegede (2009) established that age made no difference among teachers' views or attitudes towards integrating digital technologies in teaching and learning. However, Padmavathi's study (2013) established that even though there was no difference in age on teachers perceived use of computers, there was a difference in age on how teachers used computers.

Personal knowledge and skills: This aspect has a significant degree of influence on how teachers work. For example, Mahdi and Al-Dera Sa'ad (2013), Handal (2004), and Mumtaz (2000) found that teachers' digital personal knowledge and skill, which they acquire from the use of digital devices in their everyday private lives or sometimes from formal training can have an impact on how teachers adopt and integrate digital technology in teaching and learning.

Confidence: Confidence in content handling and the use of strategies and resources is another aspect of a personal landscape of teacher professional identity that is influential on teachers. Teachers' confidence can result from an extensive exposure to the content through reading or other means, and from the use of teaching strategies and resources. Teachers' confidence can encourage them to transfer their personal knowledge and skills that they acquire in their private life into the classroom. Teachers' transfer of personal knowledge to the classroom can be an indication of how much they value such knowledge for their students.

Personal beliefs about teaching and learning: Personal beliefs also play a vital role in shaping a teacher's professional practice. Teachers' beliefs about teaching and learning are usually shaped by their individual experiences and personal histories. For example, Riel and Becker (2008), Rousseau (2004), and Beijaard et al. (2000) observed how aspects such as individual experiences and histories as well as the interpretation of teaching and learning influenced teachers' practices.

3. Rsearch Objectives

The purpose of this study was to investigate how the landscape of teacher professional identity influences teachers' adoption and integration of digital technologies in teaching and learning. Therefore, the following data was collected for this study:

1. The conditions of digital technologies in teachers' personal lives;
2. Teachers' adoption and integration of digital technologies in Lesotho classrooms; and;
3. How teachers' perceptions of the conditions of digital technologies in their personal lives influence their (teachers) views on the adoption and integration of digital technologies in Lesotho classrooms;

4. Significance of the Study

Understandig how the personal landscape of teacher identity influences teachers' decision to adopt and integrate digital technologies in teaching and learning can benefit educational systems. First, the findings of this study can benefit the Lesotho education system which, similar to other education systems, needs to keep up with the trends in education and make education relevant to modern communities. Also, *Education Goal 2* in the Lesotho Curriculum and Assessment policy (Ministry of Education Lesotho, 2008) stipulates that the Lesotho education should focus on the requirements and development needs of a country. Such needs include scientific thinking, problem-solving, entrepreneurial, and technological skills. This justifies why teachers should adopt and integrate digital technologies in the schools in Lesotho. Information on how digital technologies should be adopted and integrated in teaching and learning in the schools in Lesotho is missing from the current education policy. Also, the perceptions of teachers in the schools in Lesotho on technology adoption and integration in teaching and learning are not known. Therefore, understanding how teachers currently view and value technology, and the factors which influence their views is an important starting point. The findings of this study might provide a base for the design and development of training programs which can effectively influence teachers' response to digital technology adoption and integration for teaching and learning.

5. Research Design and Methodology

5.1 Population and sampling
The population from which the sample for this study was drawn consisted of 500 student teachers who were enrolled in the Faculty of Education at the National University of Lesotho. These teachers were upgrading their teaching qualifications from a college diploma to a university undergraduate teaching degree. Of this cohort, 213 student teachers agreed to participate. They were asked to fill in the consent forms as an indication of their consent and willingness to participate in the study. They were then asked to complete the questionnaire. Thus, the sample was not random but based on those willing to participate.

The age of the participants ranged between 22 and 50 years, with the average age of 32 years. The gender ratio of these participants was 37:122 male to female teachers. The gender imbalance observed in this study, where female teachers are more in number than male teachers, is similar to that found by other Lesotho-based studies such as the Lesotho Bureau of Statistics (2015) and Mturi and Moerane (2001). The teaching experience of these participants ranged between 2 to 22 years.

5.2 Data collection methods and instrument

Data was collected using a quantitative approach. A survey was used to collect data. A questionnaire which was informed by the reviewed literature was developed. The questions in the questionnaire focused on the aspects of the personal landscape of professional identity such as access to resources, knowledge about digital technologies, confidence to operate digital hardware and software resources, the value of digital technologies in the everyday life, and the importance of adopting and integrating digital technologies in teaching and learning. The questions were both open-ended and close-ended. *Likert-scale* variables were also used.

Two hundred and thirteen (213) questionnaires were distributed to the participants but 159 (75%) were completed and returned. Therefore, data used in this study was collected from 159 teachers who were upgrading from a college diploma qualification to university undergraduate degree.

5.3 Data Analysis, Discussion and Results

SPSS was used in the analysis of data. The results are presented and discussed under the following sections: (1) digital technology conditions in personal lives of teachers; (2) teachers' perceptions on the digital technologies adoption and integration for teaching and learning; and (3) the influence of current digital technology conditions on teachers' perceptions on technology adoptions and integration. The results are predominantly presented as tables.

5.3.1 Digital technology conditions in personal lives of teachers

Digital technology conditions which were investigated in the teachers' lives include access, uses, the perceptions of the importance of digital resources as well as the knowledge and confidence that they need to use these resources.

(i) Technology Access

Technology access has been identified as one of the most influential factors on technology adoption. Therefore, teachers were asked about their access to digital technologies in their private lives. Information presented in Table 1 shows that most (98%) of the participants had access to mobile phone, compared to 94% for radio, 74% for television, and 57% for landline telephone for private use. Information in Table 1 also shows that teachers' access to other technologies such as laptops and computers, electronic organizers, dedicated digital camera, Internet and MP3 players and iPods was limited.

Table 1: Teachers' access to technology in everyday life (n=159)

Technology Type	Technology Access (%)
Mobile (Cell) phone	98.1
Radio	93.7
TV/VCR/DVD	73.6
Landline telephone	56.6
Desktop / Laptop, Computer/ Tablets	34.6
Internet	23.3
Dedicated digital camera	17.0
Dedicated MP3 player or iPod	13.2
Electronic organizers	2.5

Source: Computed by the author based on survey results.

That mobile phones were the most accessible technology among the participants is consistent with the penetration rates reported in World Factbook (Central Intelligence Agency, 2018). The popularity of mobile phones in Lesotho is possibly the result of its affordability and ready availability due to the ease of connection to the mobile phone network unlike connection to the landline telephone infrastructure which is often delayed or hindered by bureaucracy and rudimentary infrastructure.

There was no evidence in this study that gender and age had influence on how teachers accessed digital technologies. While the explanation for age cannot be provided, perhaps with gender this was because the population for this study was biased towards females.

(ii)   Uses and importance of technology
Table 2 presents information which shows that the participants used technology resources mostly for the primary functions associated with the resources which were easily accessible to them. For example, 95 percent indicated that they valued digital technologies mostly for communication functions (telephony, texting, messaging and WhatsApp) that are mostly associated with the mobile phones. Approximately a quarter (23%) claimed that they also used digital technologies for publishing information.

Table 2: Importance of technology to the participant (n =159)

Technology Activities	Quite / Very (%)
Communicate (voice telephony, texting, messaging and using WhatsApp)	95.6
Access information	68.6
Recreation	58.5
Store information	52.2
Surf Internet	36.5
Others	27.7
Publish information	23.3

Source: Computed by author from survey results

It would be expected that the unlimited access of participants to mobile phones would result in the easy access to the Internet as some mobiles phones, such as smartphones, have inbult Internet facilities. However, information in Table 2 shows that most teachers did not have access to the Internet. This situation may imply that most participants did not use smartphones; therefore, accessing the Internet through other phones was limiting. Possibly, buying data for mobile phone Internet was also expensive for these participants. Other factors that were not covered in the questionnaire might have also contributed to participants' limited access to the Internet.

(iii) *Knowledge and confidence in the use of technology*

Knowledge and confidence are important in influencing teachers' decision to adopt and integrate digital technologies in teaching and learning. They can be gained from everyday experiences, informal, or formal training. The participants in this study received computer or information technology awareness classes as part of teacher education programme from the Lesotho College of Education (where the participants gained their teaching diploma). This type of education was intended to introduce student teachers to basic computer skills such as operating basic computer hardware devices such as a keyboard, a mouse, and desktop (including laptops), and to have basic knowledge of computer processes such as creating, saving, and retrieving documents and electronic spreadsheets, and surfing the Internet. As it appears, the contents of this course were generic and were not tailored for technology integration in teaching and learning. With this basic computer education, it would be expected that all the participants would claim to possess basic computer knowedge and skills at the time they participated in this course. However, only 72 percent claimed to have participated in computer education and 68 percent reported to have basic knowledge to operate computers. Also, low confidence to operate of computer related activities (store information (69%), surf the Internet (70%) and use office application (74%)was resported among the participants. These results can be explained by two factors:

(1) According to the findings in this study, about 12 percent of the participants had 10 to 22 years of teaching experience when the study was conducated. This suggest that they were trained before the major transformation of the college in 1995. This transformation introduced new programmes and courses. Therefore, these participants missed out on computer education.

(2) The results also indicate that it was only 35 percent which reported good access to computers. The activities listed in Table 3 are mostly carried out through computers. Therefore, the percentages of the participants who rated their confidence high in carry out these activities (store information (31%), surf the Internet (30%) and use office application (26%), to match or cluster around the access percentage (35).

Basically, these results suggsted that there was a relationship between participants' access computers and their level of confidence to use computers to perform tasks.

**Table 3: Participants' confidence to carry out computer related tasks
in everyday life (n=159)**

Technology uses	Quite/Very(%)
Store information	30.8
Surf Internet	29.6
Use Office applications	26.4
Use email	15.7
Produce multimedia files	11.3
Use databases	5.0
Publish on Internet	2.5
Design webpages	1.9

Source: Computed by author based on survey results

Thus, major conclusions, based on the preceding discussion, are that generally:

- Mostly, participants' access to digital technologies was limited to the mobile and landline phones, radio, and television;
- Participants did not have access to digital resources which are commonly integrated in teaching and learning such as computers and Internet;
- There was no gender difference relating to access to digital technologies.
- Most of them had basic and limited knowledge, and low confidence to perform some basic digital activities;
- They valued technology for its basic functions such as communication and recreation;
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(iv)   Adoption and integration of digital technologies in Lesotho classrooms

One of the objectives of this study was to determine how teachers adopt and integrate digital technologies in the classrooms in Lesotho. The results of this study have indicated that teachers who participated in this study had limited access to computers and other related devices and that their computer knowledge and confidence were limited. Therefore, it was not surprising that very few teachers (less than 20%) reported that they intergraded digital technologies in teaching and learning but in a limited way. For example, Table 4 shows that only about 10 percent of teachers, used computers to support teachers' activities such as planning for teaching activities, presenting the subject matter, and processing the learners' information and records. Practically, none (about 1%) of the participants suggested that they integrated digital resources in the learners' activities for them to create presentations and documents and to learn the subject matter.

Table 4: Frequency of the use of digital technologies for teaching and learning (n=159)

Technology integration	Quite / Very (%)	Not at all / Somewhat (%)
to process and store students' information (e.g. marks, students' details)	16.4	83.6
for teaching activities (e.g. presenting information to students)	10.7	89.3
to plan for teaching activities (search for information, prepare classroom materials)	10.1	89.9
for students' learning activities (e.g. learning subject matter, creating presentations or documents)	0.7	99.3

Source: Computed by the author from results of survey.

These results are consistent with those discussed earlier in this paper which show that teachers did not have access to digital resources such as computers and laptops, and they had limited knowledge of using computers and carrying out computer related tasks. Therefore, it was in order that very few claimed to integrate digital technology devices in teaching and learning. Even though they had unlimited access to mobile and landline phones, radio, and television, with the limited knowledge, skills, and low confidence the participants had, it could be challenging and perhaps impractical for them to integrate television, radio, and landline telephone in the classroom for everyday teaching and learning. These resources are usually used where there are ready-made programmes which a teacher can take off the shelf to the classroom to support the teaching of a certain concept or skill. However, to develop such programmes usually requires expert skills, which the teachers lack.

Teachers' unlimited access to mobile phones could have been advantageous to them for technology adoption and integration if they had knowledge and confidence. They could adopt and integrate digital technologies in teaching and learning in a meaningful way for a learner. For example, Sharples, Arnedillo-Sánchez, and Marcelo (2009) suggest that the integration of mobile technologies in teaching and learning should provide learning products which are self-contained, and knowledge manipulated in a portable package which allows the learners to explore, create and share dynamic games and simulations. This observation by Sharples, et al. (2009) implies that teachers require sophisticated technology skills that are related to technology adoption and integration in teaching and learning. Therefore, because the participants in this study lacked these skills they could not adopt and integrate mobile phones for teaching and learning.

The study suggests that access to digital resources alone is not enough to influence teachers to adopt and integrate digital technologies in teaching and learning. Knowledge, skill, and confidence are equally important. This finding is consistent with Padmavathi's (2013) findings that in addition to home access to computers, skill training and competency of teachers are crucial for integration of information and communication technology (ICT)) in school education.

(v)   how digital technologies conditions of in their personal lives influence their views on the adoption and integration of digital technologies in Lesotho classrooms

Many (50%) teachers do not think that it is important to integrate digital technologies in such a way that learners are actively involved in their learning by designing and developing products as well as sharing and publishing on the Internet. As shown in Table 5, only a small number (20 - 40%) view adopting and integrating digital technologies in teaching and learning as important for these activities.

Table 5: How teachers value digital technology integration for student activities (n=159)

Students activities	Quite / Very (%)	Not at all / Somewhat (%)	Don't know (%)
Communicating (SMS, mobile phone)	44.0	38.4	17.6
Learning subject matter	34.0	38.0	28.0
Searching, assessing, and processing information	25.8	48.4	25.8
Designing and developing products /objects requested (e.g. Web page, models, simulations, files that contain video, text, and sound)	23.9	50.3	25.8
Sharing and publishing information (presentations, web page, blog, etc.)	20.8	51.6	27.7

The study demonstrates teachers' limited access to digital technologies as well as their limited knowledge and low confidence in the use of these resources. They did not have skills and knowledge to transfer to the classroom and therefore, were not integrating in teaching and learning.

6. Conclusion

This study explored the personal landscapes of professional identities of teachers who were upgrading teaching diploma to university undergraduate degree in the Faculty of Education at the National University of Lesotho. The purpose of the study was to determine how their personal landscapes of professional identities influenced their perceptions of integrating digital

resources in the classrooms to develop the learners' digital skills and knowledge. The study has established that the personal landscape of professional identity of teachers in this had influence on the teachers' adoption and integration of digital resources in a negative way. For example, teachers mostly had access to mobile phones which they used for basic traditional functions such as communication and storage of information. They had limited access to digital resources such computers, laptops, and Internet in their private lives and as a result, they had limited knowledge and skills on the use of these resources. Their confidence in the use of many digital devices was also low. Consequently, they were unable to integrate digital technologies in teaching and learning in such a way that actively involved learners in their learning. For teaching and learning, these teachers mostly viewed digital technologies as being important for supporting their classroom activities such as presenting subject content, administering student information, and communicating with the students. It is possibly that their experiences with how technology was integrated in teaching and learning had influence. However, this was beyond the scope of this study.

7. Limitations

The limitations of this study are in the methods used to select and the self-selecting nature of the sample. The sample was also possibly too small. Therefore, even though the participants were from various schools, they cannot be representative of the community of secondary teachers in Lesotho. Therefore, the findings of this study cannot be generalized. Also, other aspects of the personal landscapes of professional identities such as the school education and training of teachers were not included in this study. That is, some of the results on how teachers adopt and integrate technology in teaching and learning could have been influenced by their educational and training background. Therefore, there is a need for a study which investigates the influence of these aspects on the teachers' adoption and integration technology in teaching and learning.

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