Educational Technology Use at Afghan Public Universities: A Study of Technology Integration

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EDUCATIONAL TECHNOLOGY USE AT AFGHAN PUBLIC UNIVERSITIES:
A STUDY OF TECHNOLOGY INTEGRATION

A Thesis
Submitted to the School of Graduate Studies and Research
in Partial Fulfillment of the
Requirements for the Degree
Master of Arts

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May 2019
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This study aimed to explore academic writing instructors’ challenges along the process of technology integration in Afghan public universities; examine instructors’ current technological, pedagogical, and content knowledge (TPACK); the relationships between TPACK and instructors’ teaching experience and their educational levels. The researcher used TPACK framework proposed by Koehler & Mishra (2006) in this research. The study revealed that the instructors had pretty high level of TPACK (Mean=4.08), but average level of Technological knowledge (Mean=3.78). The study then examined two null hypotheses: a. there is no relationship between instructors’ TPACK and years of teaching experience. b. there is no connection between the teachers’ TPACK and their educational levels. Therefore, a t-test was run to examine the first hypothesis and it showed that there was no relationship between TPACK and years of teaching experience. Furthermore, a one-way ANOVA was operated to study the second null hypothesis, it also revealed that there was no connection between the teachers’ TPACK and their educational levels. The results were not in harmony with the findings in other studies. There might be two possible reasons for such inconsistency: small size of participants in the study and large extent of contextual barriers that hindered integrating technology based on what teachers learned during their educational programs and teaching experiences. Moreover, instructors noted daunting challenges to technology integration in their classrooms. At the end, a process-model was proposed based on the findings of the study and further discussion of the results. The study also suggested several implications and raised inquires for further research.
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CHAPTER 1
INTRODUCTION

Educational technology has long been an important topic for academia and social circles. Technological innovations have been transforming teaching and the way students learn. Technology can help teachers take students beyond classroom walls. Technology also can tap instructors’ creativity and enhance the quality of instruction (Rossy, Rubino, Wilkin, Shelton, & Zell, 2012). This study examines educational technology use in public universities in Afghanistan; it measures academic writing instructors’ knowledge of technology integration, explores their perceptions of the use and the challenges in the integration process including contextual barriers, and finally, suggests effective ways to move toward better technology integration and tech-supported pedagogy. This chapter includes problem statement, context of study, purpose of study, research questions, and significance of study.

Problem Statement

Integrating educational technology in academic writing classrooms in Afghanistan has always been a daunting job. The issue of integrating technology into classrooms has been studied by Mishra and Koeler (2006). They developed a technological integration model they called TPACK. This model mainly focused on teachers’ Technological, Pedagogical, and Content Knowledge, the ways the teacher can integrate technology into instructional strategies and courses’ learning and teaching materials, and a basic framework to measure teachers’ technology integration knowledge.

This study attempts to measure the university teachers’ technological, pedagogical, and content knowledge (TPACK) using a self-reported assessment questionnaire in a Likert scale, ranging from 1 indicating low level of confidence and 5 as high level of confidence towards
every statement in the constructs. Through conducting semi-structure interview, this study also explores the university teachers’ perceptions toward educational technology use, but most importantly, the challenges the instructors encountered while they were integrating technology into academic writing classrooms. Furthermore, the study suggests context-specific and effective ways to help both teachers and administrator to integrate technology in educational setting, especially academic writing classrooms.

Effective integration of technology into content and instruction requires appropriate knowledge and skills. As a result, teachers need to have technological knowledge, pedagogical knowledge, and content knowledge to effectively integrate technology into their classrooms (Blessinger & Wankel, 2013). However, teachers often show different attitudes toward the use and integration of technologies and this can directly affect their related teaching behaviors. On this note, researchers have found that negative attitudes and perceptions of technology often negatively influence instructors’ technology integration in their classrooms (Celik & Yesilyurt, 2012; Baek, Jung & Kim 2008; Lee & Lee, 2014; Curwood, 2014). Highlighting the importance of attitude in directing the behavior, Lee and Lee (2014) found that pre-service teachers with high positive attitudinal attributes toward computers and better lesson planning skills had shown growing self-efficacy in technology integration. In a similar vein, Celik and Yesilyurt (2012) found that attitude, self-efficacy, and anxiety were key attitudinal indicators of educational technology use by teachers. In a study by Beak et al. (2006), attitude also varied from old-timers to novice teachers. Beak et al. found that old-timers were often unwilling to employ technology that supported teaching and learning as compared to novice teachers who tended to use technology more readily and eagerly (pp. 224-234). Exploring the reasons for such attitudes,
Curwood (2014) claimed that technology integration mostly relied on instructors’ values, cultural models, and necessary skills.

Beside miscellaneous attitudinal attributes and perception of technology use, academic writing instructors have encountered numerous challenges when using educational technologies. These obstacles included but were not limited to: first challenge was that instructors held different sets of beliefs that might adversely influence them on making decisions to integrate technology for teaching (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010). Second challenge was lack of access to technology for either not working efficiently or not being helpful for instruction (Clark, 2006). Third challenge was undefined administrative vision that caused the teachers giving up technology integration. Fourth challenge referred to some professional development programs which were not aligned with technology and situated practices in real context (Park & Ertmer, 2008). Fifth challenges was the fact that technology integration took a huge time investment on teachers’ side (Clark, 2006). Finally, transitional challenges such as anxiety, upsetting moments, and quick adjustments also have been given short shrift when a technology was introduced or upgraded. Such intervention has led to a status in which different stakeholders needed to gain necessary problem-solving knowledge. At the same time, they have been obliged to step out of their comfort zones and pass through realms of unknown (Ryan, Toye, Charron & Park, 2012, p. 222). Barak (2007) also reported that transitional change from traditional learning environment to Information Communication Technology (ICT)-enhanced classroom was inextricably twisted with equivocal feelings and polarities amid the teachers (p.30). To come up with a full-fledged, but focused study of technology integration, one needs to consider at least some of the above challenges that the instructors are encountering on daily basis while using educational technology in their classrooms.
All of these issues have made it hard for instructors to effectively integrate technology into their instruction and course content. However, Blessinger & Wankel (2013) argue that educational technology needs to be effectively integrated into content and instruction. The present study measures teachers’ technology integration knowledge, it looks at their attitudes toward using technology, and related challenges they faced in writing classrooms.

Context of Study

This study is set in the country of Afghanistan. Afghanistan is literally known as the heart of Asia due to its geopolitical location. It has boarders with Russian union republics, China, Pakistan, and Iran. In the past, it was a country that connected different regions together; a great example was the Silk Road which was a long trade road passing through Afghanistan to transport merchandise and commodities to Europe. However, such a geopolitical quality turned Afghanistan into a conflict zone among political players in the regions.

Education in Afghanistan has endured ups and downs throughout history which has resulted in a low literacy rate. According to UNESCO (2017), the estimated rate of literacy is at about 31% among the adult population in Afghanistan. An average of 17% of Afghan females are literate, but this rate differs from region to region; it indicates a huge gender and geographical gap.

Despite Afghanistan having a low literacy rate, the English language has received much attention since 2001 from young people due to market demands for teaching the language, translating document, interpreting speeches, writing business/grant proposals, reporting in the English language for international donors, and a plethora of other related jobs.

The English language is basically taught as a foreign language at high schools in Afghanistan, starting from grade four till grade twelve. Due to various problems in terms of
lacking teaching resources, and the absence of effective context-specific pedagogies that encourage communicative skills, students do not gain high English proficiency levels especially in writing skills. Once students enter the college, they face difficulty with English language subjects which are supposed to be taught as a second language. Students cannot accomplish assigned tasks as it is expected from college students (Miri, 2016). Because many English language teachers have difficulty managing their large classes, they often end up assigning fewer writing assignments to reduce their workload (Sarwari, 2018; Miri, 2016). It is hoped that this study of technology integration can help instructors find new ways to better manage work in their academic writing classrooms.

**Purpose of Study**

Although Technology use has progressed greatly since 2001 and many university professors work to integrate technology into their instructional strategies and courses’ content, some challenges and contextual barriers still exist with this process.

This study, therefore, explores the challenges academic writing teachers encountered when attempting to integrate technology in their classroom. It investigates the teachers’ self-reported assessment of TPACK. The study then proposes ways to move toward a tech-supported pedagogy and better technology integration in an Afghanistan teaching context.

**Research Questions**

This study explores the following research questions:

- What are the challenges academic writing teachers encounter when trying to integrate technology into their classrooms?
- What is the technological, pedagogical, and content knowledge (TPACK) status of the academic writing instructors in this study?
Null hypothesis:

a. There is no connection between the TPACK and teaching experience.
b. There is no relationship between the TPACK and education level.

- What are effective ways to help teachers move toward technology-supported pedagogy?

**Significance of Study**

This study of educational technology use in Afghan Public Universities is important due to following reasons: First, it is an attempt to explore existing research on technology integration in the Afghan context which has only had limited study so far. This study also seeks to extend the related body of literature. It investigates teachers’ technological, pedagogical and technology knowledge (TPACK). The study builds on work looking at TPACK and the instructors’ perceptions about using educational technology in countries other than Afghanistan (Park & Ertmer, 2008; Ryan, Toye, Charron & Park, 2012; Kurt, 2018). While much progress has been made in terms of technology integration in higher education in Afghanistan during the past two decades, it is hoped that the results of this study will also empower not only academic writing teachers in understanding the challenges about using technology but also possible ways for rethinking about technology integration. The study also hopefully expands teachers’ professional development with using technology. The study also seeks to help university administrators consider the realities of context when training educators on how to use technology for teaching. Finally, this study also hopes to help teachers learn to use technology effectively in their classrooms.

**Definition of Key Terms**

TPACK: TPACK is a technology integration model which includes three types of knowledge that teachers need to possess for effective technology integration: Technological, Pedagogical,
and Content Knowledge (see figure 1). The model was first proposed by Koehler & Mishra (2006).

SAMR: SAMR is a technology integration model designed to assist teachers in integrating technology into teaching strategies and students’ learning processes. It was first proposed by Puente’dura (2006). SAMR stands for Substitution, Augmentation, Modification, and Redefinition technology integration stages (see figure 9).
CHAPTER 2
LITERATURE REVIEW

To understand Afghan instructors’ perceptions, attitudes and uses of educational technology in academic writing classrooms in public universities in Afghanistan, it is important to identify educational contexts in which the new technology was introduced for writing instruction. In this section, I review three areas of related literature: (1) higher education in Afghanistan; (2) academic writing and technology; (3) educational technology theories and models. Delving into these three areas provides a precise image of context, educational technology use, theories, and suggestions for moving toward a technology-supported pedagogy in academic writing classrooms.

Higher Education in Afghanistan

Afghan Higher education has gone through dramatic changes since its establishment. The education system started with the college of Physical Sciences in Kabul in 1930 and then grew to 21 public universities, 15 private universities, and more than 100 higher education institutes which now provide bachelor’s degrees for numerous disciplines (Ministry of Higher Education (MoHE, 2018). However, many universities were closed during the civil war and the number of college students decreased dramatically, leaving only 4000 students who applied to universities in Afghanistan in 2004. However, the number of college students has been growing since then due to the high rate of graduating students from secondary education (Abdulbaqi, 2009). This increase has required more facilities and resources. As a result, the Afghanistan government drafted and put into effect the National Strategic Plan I for the Ministry of Higher Education (MoHE) between the years of 2010-2014. The plan was mainly aimed at improving quality education, increasing access to higher education, and emphasizing gender equity.
Discussing egalitarianism in terms of gender, higher education institutions hosted 182,344 students, 77.5% males and 22.5% females in 2017. The number of faculty members working in higher education institutions was about 5474, 77% male and 23% females (See the appendix section) (MoHE, 2018). The Ministry of Higher Education in Afghanistan also supported a nationwide program to make English the primary medium of instruction by 2016 and to establish and modernize IT and research centers in all public universities. Unfortunately, some of these goals were not achieved. For example, changing the medium of instruction to English did not relate to the realities of the education system because graduate students from secondary school didn’t get required English proficiency level to succeed in the collegial environment (Abdulbaqi, 2009, pp. 106-113).

The National Higher Education Strategic Plan II (NHESP II) was created later to fulfill the ever-growing societal demands for high quality education. The NHESP II’s top prioritized goals were as follows: working on academic employees’ capacity building, improving teaching and learning pedagogies, integrating technology into instruction, and improving ICT infrastructure (MoHE, 2015). Dr. Mir Akram, Dean of Education and Psychology College in Kabul University, said “[MoHE] also needs to bring to par our educational system in terms of technology of other countries in the world like Turkey, U.S., and European countries” (Azizi, 2008). Information Technology, its related literacy, and access to global digital resources are essential for research, scholarship and high-quality education in Afghanistan. Students also learn better through interactive pedagogies which require extensive technology use in the classrooms and learner-centered teaching approaches (Aturupane, Sofizada, & Shojo, 2013). “Care needs to be taken in ensuring that any new teaching spaces on campus are constructed so as to be flexible and linked to ICT wireless or wired networks with suitable connections for university teachers
and students computing equipment (e.g. laptops), for future use” (Aturupane et al. 2013, p.33). Therefore, the Ministry of Higher Education established IT centers (ITCs) in public universities. The centers were responsible for providing services in three main areas: a.) offering technical support in terms of internet, hardware, procurement to the faculties, staff, and students, b.) conducting IT training for ITC’s staff, college admins, and other members, and finally c.) managing university websites, publication and center’s financial affairs (Peroz, 2014).

There was; however, an urgent and paramount need for renovating the higher education system in Afghanistan. According to MoHE’s strategic plan, private and public institutions only had facilities to accommodate only 80% of total applicants. Higher education also was suffering from low numbers of professional and expert faculty. Almost 85% percent of university lecturers had only bachelor’s degrees. The academic quality level was, therefore, noticeably low. Most teachers had two or three jobs because the salary was low, and they could not afford general living costs. These issues directly affected the quality of teaching as the teachers were not able to work on their professional capacity as it was expected and planned (Tobenkin, 2014).

**Academic Writing and Technology**

This study aims to explore technology use specifically in academic writing classrooms. Understanding the issues surrounding the teaching of academic writing, more specifically the challenges and the ways technology helps to tackle them, is critical for this study.

In some Afghan universities, the presentation of academic writing concepts was over generalized. It did not properly address students’ academic writing needs. Students were not taught how writing is “rhetorically situated” (Rankins-Robertson, Cahill, Roen, & Glau, 2010). Students also did not learn the indispensable role of writing in enhancing and improving students’ lives in areas such as academics, civics, and personal life (Rankins-Robertson, Cahill,
Roen, & Glau, 2010). The concept of teaching general writing skills has received persistent criticism as it focused more on having students acquire general writing skills rather than preparing them for future writing expectations in their own discipline and profession (Frazer, 2010). Albert Kitzhaber also reported several challenges in writing instructions in academic settings. First, an absence of a general agreement about the course content because of instructors’ biases, departmental decision-making, and existing pedagogies. Second, an imbalance in course level and work in terms of “intellectual rigor” and “maturity”. Third, not enough time allotted for academic writing instruction (as cited in Russel, 1995).

The Writing Program Coordinator Council (2014), however, defined composing in its annual statement as an intricate set of writing processes more dependent on “digital technologies” (par. 2). The council determined several outcomes for academic writing instead of setting fixed standards. The outcomes emphasize improving rhetorical knowledge, encouraging critical thinking, reading, and composing; implementing writing processes; and identifying and applying the written conventions for various genres. The Council’s reiterated that the “writers’ activities have always been shaped by technologies available for them and digital technologies are changing writers’ relationships to their texts and audiences in evolving ways” (par. 1). It also recommended faculty in all programs work on process outcomes by helping learners to understand how to implement approaches and work with technologies for conducting research and promoting communication in their disciplinary areas (par. 12).

One theory that supports using technology to teach academic writing is engagement theory. The theory suggests that project-based learning, cooperative efforts, and authentic focus (real life interactions) contribute to promoting student engagement and authentic learning in the classroom (Beldarrain, 2006).
Similarly, Kearsley & Shneiderman (1999) argue that “technology can facilitate engagement in ways which are difficult to achieve otherwise” (p.20). A case study at University of Sydney discussed both benefits and challenges of integrating technology into academic writing classrooms and the ways engagement theory could be put into practice in WebCT-based class. WebCT is an online learning management system. The results of the study revealed that using WebCT led to more student-teacher interactions, increased learning engagement, and collaborative efforts on meaningful learning projects. However, it required much time and effort for developing the tasks, posting the materials, and providing technical support (Marshall, 2007). These technological tools varied greatly in terms of functionality, affordances, and availability.

Strobl et al. (2019) studied a series of technological tools which have been used to support academic writing at the college level. They explored teaching affordances that technological advancements have brought into the classroom to facilitate learning and teaching. Through a systematic analysis of 44 technologies with 26 quantitative and qualitative characteristics connected to writing, feedback types, and embedded hi-tech specifications, they found that there was unequal existence of tools pertaining to embedded languages and instructional domains. Many tools were available for facilitating the writing process in the English language in different genres; however, the researchers found few tools in other languages. There were many technological tools for revising mechanics and structure automatically. However, the tools which scaffolded and facilitated writing development, in terms of rhetorical features and writing organization, were under-represented and scarce.

Above and beyond varied technological affordances and availability, new technologies had many benefits for the instructors in terms of developing content and delivering effective instruction as stated by Grégoire, et al. First, educational technologies helped the teachers
collaborate with other people in the same community of practice. The technologies also allowed
the teachers to gain updated information from different sources. In addition, they encouraged the
teachers to assign more collaborative projects and implement more authentic learning activities
in the classroom. It also changed the teacher’s role from a sage on the stage to more of a
facilitator and encouraged formative assessment and peer-feedback (as cited in Gibson, 2001, &
Caron, J & Brennaman K. 2009). However, technology alone could not change instruction, or the
ways students learn (Wright, 2013). It served as a “catalyst” for transforming instruction, yet it
did not determine the direction of the change (Kikis, Schuermann, & Villalba, 2009). It was
mainly dependent on the instructor and his/her innovative ways of integrating technology into
course content and teaching (Mandell, Sorge, & Russell, 2002). Instructors should be also aware
that “teaching is not effective without the appropriate use of Information and Communication
Technologies (ICT) and related resources [that helped them] facilitate student learning” (Ertmer
& Ottenbreit-Leftwich, 2010, p.255). Furthermore, it seems a better approach if teachers identify
the greatest potential for technology residing in a student-centered learning environment. Then,
the idea of agency emerges, and it starts with learning inherent to technology and teachers.
Hence, technologies are tools with “locus of learning” situated within the context. (Gobson,

Context, therefore, played a significant role in performing and understanding of
educational technology use by the teachers because overall process relied on what was available.
Most teachers emphasized that selected technologies needed to be aligned with learning
objective of the course, Internet was as an authentic source for language use, and teachers
themselves needed to be flexible toward using different educational technologies (Hsieh, 2012).
In the context of Afghanistan, large multilevel classes have always been one of the most
daunting challenge for the instructors. Sarwari (2018) studied the challenges English language teachers (ELT) struggled with in large and multilevel classes in Afghanistan. The ELT instructors reported the challenges as followings: addressing students’ actual academic needs, adopting teaching materials, providing timely feedback, classroom management, and finally access to teaching materials. The results of the study revealed that above challenges could be effectively tackled and teaching effectiveness in such classes could be enhanced mainly by integrating technology, preliminary learners’ need analysis, developing teaching materials based on the actual needs, and using peer-feedback. In a similar context, Miri (2016) found that interdepartmental collaboration was so critical in managing large class size and massive workload regarding writing activities in the college.

**Educational Technology Theories**

Technology has always been a significant part of students’ lives and it could improve students’ learning about different subject matters and increase level of collaborative efforts. Due to benefits technology brought in academic setting, current language teaching approaches recommended the instructors use educational technologies. They, however, encountered difficulty with integrating of technology specially not having appropriate knowledge in terms of the ways they could use technology to encourage and develop students’ learning (Kurt, 2018). The theories relative to technology integration might provide useful frameworks for the teachers.

Tracing back educational technology theories, they have been evolved from other learning theories particularly socio-cultural theory of cognitive development. Vygotsky, one of eminent figures in this comprehensive theory, believed that learning was a social process and students’ social interactions with others and cultural tools helped the cognitive development occur. Vygotsky’s theory relied on two levels of knowledge, individual and social levels. He
stated that semiotic mechanism facilitates social and individual operational processes and connected the levels to the other. Here the semiotic mechanisms are cultural tools, technologies, writing and language in general (as cited in Kay & Kibble, 2016, pp.21-22). Cognitive theory has been developed and became foundation for setting guidelines for designing tech-enhanced learning environment.

SAMR model designed by Puentedura (2006) was one of those efforts to integrate technology in educational environment. It was a framework by which teachers could identify the use of technology and improve its use to the next level. First, it started with substitution level which referred to use of technology with no functional change. For instance, teacher substituted writing with pen and paper with writing on word processing program in a computer. Next, level was augmentation in which technological function was improved. For example, teacher used Google Docs with the function to share, collaborate simultaneously, chat, add, and manage the task instead of a word processing program. Another level was modification which needed a significant task redesign. For instance, the teacher had students to design a weblog incorporating text and pictures to write for a larger audience. The other one was redefinition that referred to use of technology in a very creative way that was not expected in incipient stage of teaching. For example, the instructor wanted student to make an argument, conduct a research accordingly, think of reliable sources to accommodate, use text, audio, music, and infographics to make a creative video project. However, this model has always been challenged by several factors such as not considering context in the model, fluctuations and flaws in its classified structure, and highlighting product rather than the process itself (Hamilton, Rosenberg, & Akcaoglu, 2016). Some researchers, therefore, extended the idea and suggested another model which considered
the context and the process, explored the possibilities and challenges of technology intergradation framework.

**The TPACK Model**

The present study used the same TPACK framework for exploring technology integration in academic writing courses in Afghanistan; however, it only attempted to investigate technological knowledge and overlapping areas among technology, pedagogy, and content (TPACK) due to complexity of the model and the researcher’s limitation to narrow down the scope of study.

Koehler & Mishra (2009) argued that instructors should use educational technology in a way that increased student’s autonomy in the meaning making process, to improve “conceptual change”, “metaconceptual awareness”, and “cognitive flexibility,” and to connect educational and real-life, sociocultural tasks (p.60). They formerly suggested a framework called TPACK to integrate technology within course content and instruction.

Koehler & Mishra (2006) proposed the TPACK framework to respond to many challenges’ instructors encounter in integrating educational technology into their classrooms. This framework is comprised of content knowledge, pedagogical knowledge, and technological knowledge. TPACK delineated how the content and pedagogy of the course needed to be the basis for effective educational technology integration. If integrated successfully, this technology would lead to students’ success in learning.

Pedagogical content knowledge defined the relationship between specific instructional approaches and content and learning objectives of the course, whereas technological and pedagogical knowledge determined the connections between technologies being used in the classroom with specific instructional approaches. Lastly, technological content knowledge tried
to define the relationship between technological tools and course learning objectives. Once these three knowledge domains overlapped in a triangulated framework, the TPACK model emerged to help the teachers respond to the multifaceted context in which they were practicing and how to deal with technology integration effectively in the classroom (Kurt, 2018).

In this model technologies are not viewed as neutral tools. Technologies have various potentials, features, functioning limitations and “affordances” that can address particular needs better for specific learning tasks. For instance, instant messaging or a video call afforded synchronous interactions, but email did not. Being familiar with technology’s affordances and limitations would affect teachers’ pedagogy and course content, yet it was ambiguous in certain aspects (Koehler & Mishra, 2009, p. 61). Meanwhile, the relationship between teaching and technology has become convoluted by different social and institutional factors which sometimes did not support instructors’ works for incorporating technology. Moreover, the teachers sometimes did not have enough knowledge to operate and apply technologies in their classroom due to the large gap between today’s digital age and the time when most instructors were trained. Therefore, the teachers might not see themselves as competent enough to use technology or they may put less value on the importance of technology for students’ learning. If they wanted to effectively implement technology, they would need to rethink how they view technology and create a positive perception toward it (Ertmer, 2005). Similarly, teachers reported that they considered themselves as less competent in TPACK while being more competent in content knowledge. The teachers’ TPACK had a direct relationship with “their constructive pedagogical beliefs than their traditional beliefs” as shown through correlation analysis (Chai, Chin, Koh, Ling, & Tan, 2013). Other studies also revealed that instructors encountered several problems in creating technology-integrated lessons for better engaging students (Koh, 2018).
Therefore, professional development programs could help teachers manage and solve the problems. The success of training programs relied on college teachers’ actual use of technology, trainer’s perceived attitude, institution’s readiness, support (Lim et al., 2010), availability of innovative technologies in both learning environment and organization itself (Rienties et al., 2013). Teachers’ TPACK could be reported in different ways by different participants and within different context. Assessing technological knowledge was also related to specific pedagogy within specific contexts. Unfortunately, professional development programs did not take the realities of the context into account and often maintained a one-size-fits-all approach which in turn did not help teachers to get effective training on technology integration (Koehler & Mishra, 2009). Therefore, profound changes required “a mixture of cultural and institutional changes, commitment from those within the program, and active and engaged leadership,” (De León, 2013, p. 347). Program developers needed to study effective technologies and “reconcile” inconsistencies amid the technologies which were used in various contexts and disciplines (Elliott, 2018, p.22, Koh, 2018). Yet, providing effective scaffolding for teachers to change their pedagogies and improve their knowledge related to TPACK was a challenge that needed to be addressed comprehensively in a professional development program (Koh, 2018).

TPACK is also a comprehensive model for a professional development program that encompasses not only individual teacher educators but also organization as a whole. It could, therefore, serve faculty, staff, and even administrators. Faculty and staff needed to be prepared to accomplish educational tasks and the organization’s mission. The possible opportunities within the program would encourage all stakeholders to go beyond their comfort zones and improve their technology skills to the next level (Elliott, 2018). However, Shendy, Bream and Elliot (2017) claimed that professional development programs needed to be consistent and aligned with
academic department goals and disciplines to ensure trainees get access to specific field experts, professionals, content, and finally, achieve specific program objectives. Teachers could improve their knowledge of technology integration by massive exposure to and practical experience about technology use and implementing TPACK design.

Tracing preservice English language teachers’ perceived TPACK in college level course, Turgut (2017) found that sophomore pre-service instructor’s response toward their professor’s modeling was more of technological knowledge (only a list of technological tools) without providing the context, whereas junior and senior students explained more in details about how their mentor teachers had integrated technology into content and pedagogy. The instructors gave more examples of lesson planning, learning objectives, technology use, and transforming teaching and learning. The study revealed that the more pre-service teachers experienced and were exposed to actual technology integration, the better they moved from Technological Knowledge (TK) to TPACK and gained more metacognitive awareness about sophisticated forms of technology integration that involved content and pedagogical knowledge (Turgut, 2017). TPACK design supported such as “lesson design heuristics”, “meaningful learning rubrics”, and TPACK tasks could improve the teachers’ pedagogical change aligned with technology integration. They increased the teachers’ level of confidence in both TPACK and lesson design. Ultimately, the TPACK design resulted to better understanding and explanation of pedagogical changes in the planning by the teachers (Koh, 2018). Examining the effects of syntenic design activities on the teachers’ TPACK development in a professional training program and the connection between the TPACK and Community of Inquiry model, Papanikolaou, Makri, & Roussos (2017) also found that the activities helped the teachers to
improve their practical understanding of TPACK, and the two models are connected in some respects.

Reflection on actual technology integration also was one of the teaching strategies that assisted pre-service teachers in improving TPACK knowledge. Through incorporating reflective assignments into a learning by design environment in a teacher preparation program, Lu (2014) explored how pre-service teachers construct TPACK. After analyzing the teacher’s reflective journal entries, the study revealed that the teachers improved primary knowledge of TPACK to some extent although their reported TPACK content and technology knowledge were shallow in details. Pre-service teachers could have a better retention of materials and overall learning by making associations with their actual experiences in the classroom. Such approach encouraged them to rethink about the effective ways to implement the knowledge and skills they gained and transferred it to future contexts while maintaining an objective, reflective, flexible state of mind (p.13).

This literature review shows the many benefits and challenges teachers experience when attempting to integrate technology into the classrooms. The research indicates that the TPACK model holds promise for helping teachers to succeed with technology integration. The present study seeks to build on these other scholars’ work by examining TPACK in an Afghan educational setting.
CHAPTER 3

METHODOLOGY

This chapter aims to provide detailed information about research method design, rationale for the design, research participants, study administration procedures (reliability of the data, validity of research instrument, ethical considerations, site permission, research instruments (survey questionnaire and semi-structure interview), data analysis process (data analysis software), and finally, research limitations.

Research Questions

Therefore, the current study was guided by following research questions:

- What are the challenges academic writing teachers encounter when trying to integrate technology into their classrooms?
- What is the technological, pedagogical, and content knowledge (TPACK) status of the academic writing instructors in this study?

Null hypothesis:

a. There is no connection between the TPACK and teaching experience.

b. There is no relationship between the TPACK and education level.

- What are effective ways to help teachers move toward technology-supported pedagogy?

Research Design

The study has utilized mixed research approach to compare the results of quantitative and qualitative data after analysis (Creswell, 2014). More specifically, it used both quantitative and qualitative cross-sectional design. Cross-sectional design shows data collection on subgroups of a population in a given time-period (Bryman 2004). The study included years of teaching experience (0-5, 6-10), and education level as variables, but it only focused on technological
knowledge, and TPACK constructs from technology integration model proposed by Koehler and Mishra (2006). It also included the study of context of technology integration.

Self-assessment of technological knowledge and TPACK is initial stage for making decision about pedagogies used within a classroom level or in institutional level in general (Roblyer and Doering, 2010). At the end, collected data from survey and interview was analyzed. The TPACK technology integration model shown below delineated the focus of the research which were only technological knowledge, overlapping area of the three constituents (TPACK), and finally, the context of use.

![Figure 1. TPACK model by Koehler & Mishra (2006).](image-url)
Rationale for Mixed Methods Research

This study used a mixed method research approach for a number of reasons. First, it provided more chances to address and respond to research questions and it gave more room for the researcher to maneuver on data collection. (Johnson & Onwuegbuzie, 2004). In other words, it provided the researcher “multiple ways of seeing and hearing” (Greene, 2007, p.20). Second, a mixed approach better addressed the phenomenon that were complex and locally situated (Patton, 2002). Finally, the results of this study were more broadly informed because the researcher looked at inquiry in both quantitative and qualitative ways (Greene, 2007).

Context

The data was collected from the English Departments of three Afghan public universities and one educational project situated in one of the Afghan public universities. All the institutions were under different pseudonyms to keep anonymity for entire research process. As a result, they were named as Western University, Central University, Northern University, and Edu Project.

The Edu project is sponsored by the U.S embassy, Kabul. It hosts over 1000 university students every year and offers them different programs such as TOEFL Preparation, English Academic Writing I & II, Business Writing, and computer programming. The academic writing classes are held in computer labs equipped with projectors and internet access.

At the other universities in the study, writing courses are, however, equipped with few technological tools and resources. In general, the universities did not use any learning management systems (LMS) to facilitate learning and teaching. Searching through each university’s website, there was no direct mention of technology use or its integration in instruction and curriculum and related educational goals.
Participants

The survey questionnaire was sent to 18 academic writing instructors for exploring technology integration, their perceptions, and existing institutional efforts. The selection criteria for recruiting participants included: the teachers should have had at least 1 year of teaching experience in academic writing at the college level, they had used educational technology in their teaching, and they should have been between ages 24-38.

Participants were recruited for interviews from the primary group by a stratified sampling process. This type of sampling required the target population to be divide into two strata. Then researcher selects samples within each stratum randomly. Every single primary participant was given an equal chance to be selected in the research (Martínez-Mesa, et al. 2016). In this study, primary teacher participants were divided into two strata based on years of teaching experience: 0-5 and 5-10 years. At the end, 3 individuals were selected in each group to make up a total of 6 for participating in the interview.

Administrative Procedures

The research has gone through different administrative procedures such as reliability in the research conduct, validity of research instruments, ethical consideration, and site permission. The researcher followed these procedures to get the research aligned with research ethics and IUP’s Institutional Review Board (see the appendix section).

Reliability

Reliability is important especially in behavioral studies. Reliability was defined as consistency of measurement across items and over time within similar contexts and subjects (Drost, 2011; Sullivan, 2011). All transcribed sentences, codes, themes, and statistical data were checked three times to avoid errors, pitfalls, or misrepresentations of data. After completion of
transcribing interviews verbatim, a copy of the transcribed interview was given to the interviewee to check whether there was any inconsistency between his/her opinions and presented data.

**Validity**

The study also utilized measures to ensure validity. First, survey questionnaires were sent to four survey experts for *face validity*. The experts studied the survey to make sure each Likert statement falls into a related and accurate construct (technological knowledge, TPACK, context for teaching with technology, and top-down imposition of technology in teaching) and checked both survey and interview questions for common errors like confusing, double-barreled and leading prompts (Porter, 2011). Additionally, the survey questionnaire was passed through pilot testing as it was suggested before the survey was administered (Brace, 2018). It was first sent to 20 participants and then after collecting primary data, some statements were deleted from the survey because they were confusing, and the participants had difficulty responding to them.

**Ethical Considerations**

Research ethics is a part of good research design (Spickard, 2016). In this study, the researcher had responsibility to ensure that all target participants voluntarily took part with their consent in the research. He therefore provided consent letters to be signed by the participants (Punch, 2016). In addition, to protect and respect confidentiality, the researcher ensured that all personal and collected information would be preserved in a secure place. Moreover, to preserve anonymity, pseudonyms were used information would be divulged only by their consent (Spickard, 2016).

The research was conducted with respect for all ethnic groups, genders, and social classes. The researcher persistently attempted to maintain an impartial state; therefore, he
avoided adding his personal emotions and inferences by referring results to participants’ own beliefs or other research (Punch, 2016; Spickard, 2016).

Data also must be presented with accuracy, so researcher was responsible to prevent any fabrication, fallacy, and erroneous conclusions. To do so, the researcher shared not only interview transcriptions, but also findings of the study to participants to ensure the accuracy of the data and avoid any misinterpretation (Punch, 2016).

Finally, to ensure that participants answered the questions without any pressure, they were informed that they could skip any questions if they felt hassle, embarrassment or discomfort (Punch, 2016; Spickard, 2016).

**Site Permission**

To collect the data in target research sites, the researcher sent official letters to get permission. First, official request letters were signed by the researcher and then were sent to each target university’s authorities to sign (see Appendix. C). Subsequently, the signed site letters were submitted to the Institutional Review Board at Indiana University of Pennsylvania (IUP) for approval (see Appendix. D).

**Research Instruments**

The research utilized a survey questionnaire and semi-structured interview.

**Survey Questionnaire**

The survey instrument was adopted from the TPACK survey instrument (Schmidt et al., 2009) and modified later for academic writing instructors. A Likert scale was chosen for this survey. The prior context-specific statements were removed from the survey and then it was modified for the academic writing context. (see Appendix. A)
The researcher distributed the survey questionnaire for getting primary data on realities of sites and participants. Administrating the survey, therefore, helped the researcher to modify the questions and come up with a list of useful prompts that were clear, precise and effective to address the instructors’ perceptions of technology use in academic writing course. It also helped to shape well-rounded semi-structured interview questions.

The survey questionnaire included three parts: Demographic information, Likert scale questions and open-ended questions. The demographic section was comprised of prompts to receive information about age, gender, level of education, and number of years teaching in academic writing. The second part included a list of hypothesized items within a Likert scale used to measure self-reported teachers’ technological construct, TPACK (Schmidt et al., 2009), and context of educational technology integration. The last section was comprised of open-ended questions and it was used to have participants share their actual teaching experiences about technology use in the academic writing classroom (See Appendix. B).

**Semi-Structured Interview**

The study also utilized a semi-structured interview to collect data from the teacher participants to get a deeper understanding of their technology integration, instances of technological use, technological barriers, and the teachers’ efforts in the process of integration. The interview included both closed and open-ended questions and if unexpected data or responses happened during the interview, the researcher followed up by on-the-spot questions to delve more into the topic (see the sample of interview questions in Appendix. B).

**Data Analysis**

Once data were collected through the survey questionnaire and semi-structured interview, different methods and tools were used to analyze it. The study first utilized a constant
comparative method to analyze data. Therefore, some data analysis tools were required to find descriptive, inferential statistics, salient themes, frequency, and so forth.

**Survey Questionnaire Data Analysis**

Likert scale questionnaire that was designed to measure instructors’ latent technological knowledge and TPACK is used to accumulate necessary data to answer research questions. Raw data was analyzed by Statistical Package of the Social Sciences (SPSS).

**Data Analysis Software for Questionnaire**

Statistical Package of the Social Sciences (SPSS) was used to analyze numeric data and descriptive statistics to measure technological knowledge and TPACK. Then, a t-test was run to examine the relationship between the teachers’ TPACK and years of teaching experience. Subsequently, a one-way ANOVA was run to examine the connection between the instructors’ TPACK and level of education. Collected data from survey questionnaire, therefore, needed to be run through different procedures to obtain descriptive and inferential statistics.

**Semi-Structured Interview Data Analysis**

Data was collected through one-on-one semi-structured interviews and it was analyzed in a qualitative manner by applying a coding system. A list of codes was generated, and then salient themes were derived from the data analysis. Focusing on research questions, themes were reduced and then carefully synthesized throughout qualitative data analysis including different components: First, organizing the data that could be done by using summaries of interviews, developing categorized themes, adding descriptors and finally, modifying them. Subsequently, developing a context-specific model that was related to the TPACK framework and was also based on conducting constant comparison approach, combining themes and categories. This model helped to explain the teacher’s actual technological knowledge and TPACK, the
technology integration process they followed, and the efforts required to develop a technology-supported pedagogy.

**Data Analysis Software for Interview**

NVivo software was utilized to apply a coding system to the qualitative data and to find salient themes. Analyzed data can be represented through various charts and graphs.

Table 1

*Data Analysis Procedures*

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Semi-structure Interview</th>
<th>Integrating Analyzed Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative data analysis (SPSS)</td>
<td>Coding system (NVivo)</td>
<td>Questionnaire, and interview</td>
</tr>
<tr>
<td>Descriptive data analysis (mean, standard deviation &amp; frequency)</td>
<td>Categorizing codes &amp; finding themes</td>
<td></td>
</tr>
<tr>
<td>Comparative analysis of cases (t-test and ANOVA)</td>
<td>Developing theory</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 4
RESULTS

This chapter presents the results of the study on educational technology use in academic writing courses at Afghan public Universities. It includes participants’ demographic information, their existing technological knowledge and TPACK, their perception of educational technology, the types of educational technology they were using, the challenges they encountered in teaching academic writing, and finally, what they suggested for managing and tackling those challenges in better integrating technology into the content and instruction.

**Survey Demographic Information**

Participants’ demographic information is as follows: The level of education varies from bachelor’s to doctoral degree and the years of experience also fluctuates from instructor to instructor. The age of my participants ranges from 28 to 37.

Table 2

*Survey Participants’ Ethnographic Information*

<table>
<thead>
<tr>
<th>No</th>
<th>Gender</th>
<th>Age</th>
<th>Education</th>
<th>Teaching Experience</th>
<th>University’s Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>28</td>
<td>B.A</td>
<td>5</td>
<td>Edu Project</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>27</td>
<td>B.A</td>
<td>2</td>
<td>Western University</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>31</td>
<td>B.A</td>
<td>4</td>
<td>Edu Project</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>10</td>
<td>B.A</td>
<td>8</td>
<td>Western University</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>31</td>
<td>B.A</td>
<td>3</td>
<td>Edu Project</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>37</td>
<td>B.A</td>
<td>10</td>
<td>Western University</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>28</td>
<td>B.A</td>
<td>4</td>
<td>Western University</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>32</td>
<td>B.A</td>
<td>10</td>
<td>Northern University</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>33</td>
<td>B.A</td>
<td>4</td>
<td>Western University</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>29</td>
<td>B.A</td>
<td>3</td>
<td>Western University</td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td>27</td>
<td>M.A</td>
<td>10</td>
<td>Northern University</td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>31</td>
<td>M.A</td>
<td>10</td>
<td>Western University</td>
</tr>
<tr>
<td>13</td>
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<td>37</td>
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</tr>
<tr>
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<td>M</td>
<td>33</td>
<td>Ph.D</td>
<td>3</td>
<td>Central University</td>
</tr>
</tbody>
</table>
As shown in table 2., both female and male academic writing instructors participated in the survey; however, the number was not balanced due to fewer number of female instructors teaching academic writing courses. Some teacher participants had Western education background. They are likely familiar with different educational technologies as they were exposed to actual technology integration during their educational programs in Western context, especially United States.

After representation of demographic information, survey questionnaire data was analyzed to understand academic writing teachers’ current technological knowledge, as well as TPACK. This section of the study attempted to accomplish two things: firstly, respond to the second research question and secondly, determine whether the null hypotheses that the researcher intended to examine was true or false.

Q2. What is technological, pedagogical, and content knowledge (TPACK) status of academic writing instructors?

**Null Hypotheses**

- There is no connection between TPACK and teaching experience.
- There is no relationship between TPACK and education level.

First, the study examines the teachers’ current technological knowledge and further investigates TPACK. Technological knowledge construct in the questionnaire was comprised of 10 items that ranged from ease of learning to use of technology in different stages of writing process from planning to revising. A five-point Likert confidence scale with a score 1 equal to low confidence and five representing high confidence was used for each item in the construct. After computing the average score, the weight, frequency, and cumulative percent of each item, it revealed that low average score started from 3 and it then increased gradually instructor to
instructor and eventually reached the maximum score of 4.80. Each instructor’s technological knowledge has shown in the following table.

Table 3

_Instructors' Current Technological Knowledge_

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>3.00</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>3.20</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>3.30</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>3.40</td>
<td>2</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>3.50</td>
<td>2</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>3.60</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>3.70</td>
<td>1</td>
<td>5.6</td>
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<tr>
<td></td>
<td>3.80</td>
<td>3</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
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<td>1</td>
<td>5.6</td>
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<td>4.30</td>
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<td>5.6</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

After the results of technological knowledge, the study examines the teachers’ TPACK. This construct was comprised of 6 items ranging from integrating technology into instruction and content, designing related objectives based on Blooms’ taxonomy to connecting technology with assessment process. The weight, frequency, and cumulative percentage of each academic writing instructor has shown in table 4. Likewise, TPACK was varied from instructor to instructor, starting from a low score of 2.83 and ending with the highest score of 5.
Table 4

*Instructors’ TPACK Descriptive Data*

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.83</td>
<td>1</td>
<td>5.6</td>
<td>5.6</td>
</tr>
<tr>
<td>3.00</td>
<td>1</td>
<td>5.6</td>
<td>11.1</td>
</tr>
<tr>
<td>3.33</td>
<td>1</td>
<td>5.6</td>
<td>16.7</td>
</tr>
<tr>
<td>3.67</td>
<td>2</td>
<td>11.1</td>
<td>27.8</td>
</tr>
<tr>
<td>3.83</td>
<td>2</td>
<td>11.1</td>
<td>38.9</td>
</tr>
<tr>
<td>4.00</td>
<td>4</td>
<td>22.2</td>
<td>61.1</td>
</tr>
<tr>
<td>4.17</td>
<td>1</td>
<td>5.6</td>
<td>66.7</td>
</tr>
<tr>
<td>4.67</td>
<td>1</td>
<td>5.6</td>
<td>72.2</td>
</tr>
<tr>
<td>4.83</td>
<td>3</td>
<td>16.7</td>
<td>88.9</td>
</tr>
<tr>
<td>5.00</td>
<td>2</td>
<td>11.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

After measuring every individual instructor’s technological knowledge and TPACK, a descriptive summary of the results has been provided to better understanding of the two constructs. Composite value for technological knowledge was 3.7833 with standard deviation of below 0.5. It was revealed that technological knowledge rate was not that high. However, TPACK value gained slightly larger weight and received the mean number had a mean of 4.0833 with standard deviation of 0.66. This shows that the teachers had pretty high technological, pedagogical, and content knowledge (TPACK). Here is shown the summary of both constructs.

Table 5

*Instructors’ Technological Knowledge and TPACK Descriptive Summary*

<table>
<thead>
<tr>
<th>Technological Knowledge</th>
<th>TPACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>18</td>
</tr>
<tr>
<td>Valid</td>
<td>18</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>3.7833</td>
</tr>
<tr>
<td>Median</td>
<td>3.7500</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.48658</td>
</tr>
</tbody>
</table>
After measuring both technological knowledge and TPACK, the years of experience variable was collapsed into two categories: 0-5 and 6-10. For the next step, a T-test was run on TPACK score to compare the results of categorical years of experience. The p-value of the t-test (p = .144) suggested that there was no significant difference in the TPACK score for educators who have 0-5 and 6-10 years of experience in teaching academic writing although there was a slight fluctuation. Therefore, the first null hypothesis appeared likely to be true indicating that there is no relationship between TPACK and teaching experience. The results of both tests are shown down below.

Table 6

*The Result of T-test on TPACK and Teaching Experience*

<table>
<thead>
<tr>
<th>Years of teaching experience categorical</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>9</td>
<td>3.8519</td>
<td>.69444</td>
<td>.23148</td>
</tr>
<tr>
<td>6-10</td>
<td>9</td>
<td>4.3148</td>
<td>.58002</td>
<td>.19334</td>
</tr>
</tbody>
</table>

For examining the second hypothesis about the relationship between TPACK and level of education, a one-way ANOVA on the TPACK composite score was grouped by three categories of education: Ph.D., Masters, and Bachelor’s. First, a descriptive analysis between each group was performed (Table. 7). Afterwards, the variances passed a homogeneity test (Table. 8), but the post-hoc test was not performed for the TPACK because at least one group had fewer than two cases (Ph.D. group). Obtaining p-value for the ANOVA (p = .417), it, likewise, suggested that there was no significant difference in the TPACK score amongst educators with different levels of education. The results of the ANOVA are shown in table 9. The second hypothesis also appeared to be true even though there was slight fluctuation between the levels. There is no
The relationship between TPACK and education level. TPACK mean growth across educational level is shown in a line chart as well.

Table 7

**Descriptive Summary of TPACK for Each Group Based on Educational Level**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Lower Bound</th>
<th>Interval for Mean Upper Bound</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelors</td>
<td>4</td>
<td>3.7500</td>
<td>.50000</td>
<td>.25000</td>
<td>2.9544</td>
<td>4.5456</td>
<td>3.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Masters</td>
<td>13</td>
<td>4.1410</td>
<td>.70332</td>
<td>.19507</td>
<td>3.7160</td>
<td>4.5660</td>
<td>2.83</td>
<td>5.00</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>1</td>
<td>4.6667</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>4.67</td>
<td>4.67</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>4.0833</td>
<td>.66483</td>
<td>.15670</td>
<td>3.7527</td>
<td>4.4139</td>
<td>2.83</td>
<td>5.00</td>
</tr>
</tbody>
</table>

Table 8

**The Result of Test on Homogeneity Variances**

<table>
<thead>
<tr>
<th></th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on Mean</td>
<td>1.273</td>
<td>1</td>
<td>15</td>
<td>.277</td>
</tr>
<tr>
<td>Based on Median</td>
<td>1.873</td>
<td>1</td>
<td>15</td>
<td>.191</td>
</tr>
<tr>
<td>Based on Median and with adjusted df</td>
<td>1.873</td>
<td>1</td>
<td>14.329</td>
<td>.192</td>
</tr>
<tr>
<td>Based on trimmed mean</td>
<td>1.449</td>
<td>1</td>
<td>15</td>
<td>.247</td>
</tr>
</tbody>
</table>

Table 9

**ANOVA Test**

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.828</td>
<td>2</td>
<td>.414</td>
<td>.929</td>
<td>.417</td>
</tr>
<tr>
<td>Within Groups</td>
<td>6.686</td>
<td>15</td>
<td>.446</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7.514</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 2. TPACK mean growth distribution
Interview Demographic Information

There were six participant teachers all male for the interview. They also were from different universities across Afghanistan and had different educational level varying from B. A to Ph. D. Moreover, they have been differed in terms of teaching experience.

Table 10

Interview Participants’ Ethnographic Info

<table>
<thead>
<tr>
<th>No</th>
<th>Gender</th>
<th>Age</th>
<th>Education</th>
<th>Teaching Experiences</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>29</td>
<td>B. A</td>
<td>3</td>
<td>Western University</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>32</td>
<td>B. A</td>
<td>10</td>
<td>Northern University</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>33</td>
<td>Ph.D.</td>
<td>3</td>
<td>Central University</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>29</td>
<td>M.A</td>
<td>7</td>
<td>Western University</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>31</td>
<td>B. A</td>
<td>5</td>
<td>Edu Project</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>28</td>
<td>B. A</td>
<td>3</td>
<td>Edu project</td>
</tr>
</tbody>
</table>

Writing Instructors’ Perceptions

Most interview participants showed a positive perception toward educational technology use (See Figure.). They perceived technology as a leveraging power in teaching and learning. It gave them a sense of freedom, facilitated and expedited teaching and learning, helped them to be more resourceful, and finally, had better immediacy in teaching. For instance, Ahmed said:

I feel great! Using technology gives me a sense of connections. I feel like I am connected with the whole world. It gives me a sense of freedom through which I can reach out to as far places as I could even not be able to go physically go there in my entire life.

Technology allows me to use my potential in full rather than being limited to a text book or a course syllabus. By using technology, I can almost always find most of my answers online. However, this may not be the same for many those who might be using technology depending on the level of their knowledge of using technology.
However, the other instructors had mixed feelings about the use of technology in the academic writing classroom. They showed positive feelings toward technology because of the engagement and sense of accomplishment it generated; however, they connected the perception to the context of use and its purpose. Therefore, they sometimes felt scared and even frustrated when challenged by the complexity of the educational technology and its unknown features. For example, Sohrab said:

If I use technology at home, I have different feelings. If I use technology in the class, I have different feelings depending on the context and purpose of use I have different feelings towards using technology. Sometime, technology make me frustrated, sometimes it makes me happy because it helps me to get my job done.

![Pie chart showing positive and mixed perceptions of technology use](image.png)

*Figure 3. Academic instructors’ perception toward technology use.*

**Academic Writing General Challenges**

The survey participants noted some general challenges that they encountered in teaching academic writing. The challenges covered a broad spectrum. Among these challenges, multi-level learners, lack of writing proficiency, and socio-cultural barriers toward writing have gained heavy weight in terms of frequency and saliency (See Table.10).

Table 11
### List of Academic Writing General Challenges

<table>
<thead>
<tr>
<th>No.</th>
<th>Challenges</th>
<th>Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Difficulty to accommodate all students' educational needs</td>
<td>1</td>
<td>Students have come to the college with different social-cultural background and they also different academic needs</td>
</tr>
<tr>
<td>2</td>
<td>Teachers' workload</td>
<td>1</td>
<td>Teachers have to work more 20 hours per week, so it influences the quality of education as they cannot develop materials, get preparation, and provide timely constructive feedback.</td>
</tr>
<tr>
<td>3</td>
<td>Physical setting restrictions</td>
<td>1</td>
<td>The classroom does not accommodate so many students, so teacher is not able to implement group work activities.</td>
</tr>
<tr>
<td>4</td>
<td>Non-contextualized writing materials</td>
<td>1</td>
<td>Writing materials are not adapted based on realities of the context, so the parameter of particularity is not considered.</td>
</tr>
<tr>
<td>5</td>
<td>Lack of writing support services</td>
<td>1</td>
<td>There is no writing center and online tutoring services.</td>
</tr>
<tr>
<td>6</td>
<td>Large class size</td>
<td>2</td>
<td>There are 40 to 50 students in each class.</td>
</tr>
<tr>
<td>7</td>
<td>Limited teaching resources</td>
<td>2</td>
<td>There are a few numbers of writing textbook and resource books to teach writing.</td>
</tr>
<tr>
<td>8</td>
<td>Not giving timely feedback</td>
<td>2</td>
<td>Teachers are not able to provide timely feedback due to various factors such large class size and teaching workload.</td>
</tr>
<tr>
<td>9</td>
<td>Socio-cultural barriers toward writing</td>
<td>3</td>
<td>Writing and reading have been given short shrift in early education and even further in collegial level.</td>
</tr>
<tr>
<td>10</td>
<td>Lack of writing proficiency</td>
<td>3</td>
<td>Students’ writing skills are not well developed during the secondary education, so academic writing transfer doesn’t happen as it is expected and planned.</td>
</tr>
<tr>
<td>11</td>
<td>Multi-level learners</td>
<td>4</td>
<td>Students have different language proficiency level ranging from intermediate to advance</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td></td>
</tr>
</tbody>
</table>
Besides having a significant gap among students’ proficiency levels, writing/reading in the English language are given limited attention during primary and secondary education in Afghanistan. Furthermore, writing in English has not become a part of mainstream culture and has not turned into a significant aspect of the society’s fabric, as Sohrab stated.

**Technology Integration Barriers**

The participants in the survey reported a number of barriers that they encountered during technology integration in academic writing classrooms. These barriers included absence of technology integration as an institutional goal, digital divide, need for professional development programs, negative perception toward educational technology, resistance toward technology use, students' lack of technological knowledge, teachers' lack of technological knowledge and TPACK, technical problems, and unavailability of educational technology. The barriers and their frequency are noted in the chart below.

Table 12

*Technology Integration Barriers*

<table>
<thead>
<tr>
<th></th>
<th>Absence of technology integration as a institutional goal</th>
<th>Digital divide</th>
<th>Need for professional development program</th>
<th>Negative perception toward educational technology</th>
<th>Resistance toward technology use</th>
<th>Students' lack of technological knowledge</th>
<th>Teachers' Lack of Technological knowledge and TPACK</th>
<th>Technical problems</th>
<th>Unavailability of educational technology</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 2</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Participant 3</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Participant 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Participant 5</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Participant 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
SAMR Breakdown

Analysis of the data revealed that most participants could integrate technology into their writing classrooms, but this integration was limited to the initial stage of substitution based on the SAMR model. There was a broken link that prevented the teachers from reaching the enhancement and transformation phases. They were able to implement technology which acted as a substitute, but with no factual change. Ebrahim, one of the participants in the survey, noted the following:

I felt if I was asking them to write with the pen and paper, they would not be able to count number of words needed and plan well, so I suggested a word processing software instead. That was my understanding that students learn the process much better if they do not write with their hand. I felt that I was putting them in an authentic situation.

Ahmad, another academic writing teacher, highlighted the affordances of technology as a substitute. He indicated that he usually used Microsoft Word for showing how people write a text for academic purpose. He said Microsoft Word was simple and easy-to-use software that almost all students were familiar with.

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![Figure 4. SAMR breakdown.](broken link)

However, according to the participants, technology integration did not proceed further due to the absence of educational technology and technological support in the institution. Even the early stage was problematized by students’ low accessibility to common technology. For instance, Sohrab indicated that some students did not have computers at home, and if he asked them to write something using word processing software, they could not. Even when he requested students to go to a computer lab at the university, they called off the request by mentioning the fact that they came from remote locations in the city and they had a shuttle that came at specific times for transportation and so they could not stay after the class. He considered their concerns and let them write with pen and paper.
Criteria for Selecting Appropriate Technology

Participants reported the following selection criteria for using technology: accessibility, affordances, available technological knowledge, training, and support, cost-free, engageability, and practicality. Through analyzing the data, it was revealed that practicality had saliency over other criteria. Additionally, accessibility and available technological knowledge, training, and support criteria had gotten higher frequency and saliency than the rest. The criteria and their frequencies are shown in the following chart.

Table 13
Criteria for Selecting Appropriate Technology

<table>
<thead>
<tr>
<th></th>
<th>Accessibility</th>
<th>Affordances</th>
<th>Available technological knowledge, training, and support</th>
<th>Cost-free</th>
<th>Engageability</th>
<th>Practicality</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Participant 2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Participant 3</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Participant 4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Participant 5</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Participant 6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

As mentioned earlier, participants indicated that selection of technology depended on the extent that a particular technology was practical in a specific context. Although they agreed that the use of specific technology needed to be practical and based on the realities of the context, they held different perspectives about it. For instance, Ebrahim stated:
I am looking for sort of educational technology that can help me with my teaching. For instance, there are software that we can install them on an electronic device like a computer. Technology should also reinforce the learning abilities of my students. A problem with our context is that most educational institution do not have access to internet if they do, it is limited, and they are not providing internet for all students. Considering the realities of the context, we can use of educational technologies that are offline.

However, Ahmed extended the criterion and connected it to parameters of particularity and possibility. He stated, “[selection of an educational technology] depends on what type of technology I may need to use. As a general rule, I will consider parameters of particularities, possibility and practicality of the technology use to ensure [that technology] is helpful medium for my class”. Moein, another interview participant, also emphasized the significance of context in selecting technology. He said, “if I do not consider contextual facts, so technology integration cannot be practical”.

**Students’ Leaning Engagement by Technology Use**

The academic writing instructors in the interview highlighted the importance of students’ learning engagement by technology use. For instance, Moein used video technology as a prompt for engaging students in learning and writing. He said, “after I played a short movie for students to watch, I asked them to write an essay or a reflection paper on it”.

Naser highlighted using social media and collaborative tools for getting students engaged with the writing process. He indicated that he used to employ the social media platform Facebook. He recently learned that twitter was also a great tool to teach writing, especially when teachers used a hashtag for an assignment, so every student wrote based on that hashtag. He also
said he tried to make sure students came to the computer lab since some of his students might not have access to technology back home. He would also use Google Docs and then if the students needed any help, he would offer it on the spot.

On the other hand, Sohrab tried to make the best use of what was available in his institution and consider the realities of the context when using technology. He stated that he was using PowerPoint and a projector mainly for in-class activities. He said the university did not have a ceiling mounted projector, but instead had a portable one. He wrote some parts quickly on the computer and projected it on the screen. Then, students looked at that piece of writing together and he gave feedback to the whole class. Sohrab had more technological resources available, so he used a learning management system. He indicated that he had more space there; students joined an online platform, and then received feedback there. He even started using a Telegram channel (a social networking technology) through which he shared materials with his students, provided them feedback, and where students could also share their ideas.

Jacob, another interview participant, pinpointed visuals as a great support for engaging students in the writing process. He mentioned that one of the biggest benefits and advantages of using educational technology in his classes were the visuals and pictures that he was using to illustrate picture stories or to help the students activate schema. Furthermore, he would use educational technology in the pre-stage of the lesson where students had to brainstorm, come up with the ideas, put their ideas together, and at the end, he gave them prompts to start their writing.

Ahmed tried to keep students within the process and learning loop by identifying students’ current knowledge of technology, its functionality, and its affordances. This provided the teacher the ability to scaffold which allowed students to acquire that knowledge, gave them
freedom to choose the technological tools, and made technology use a fun activity. He explained the process of engaging students as follows:

I would do my best to first make sure my students know exactly how that specific technology works. I would encourage my students to come in the class with their own devices (laptop, cellphone, iPad, etc.) and have access to internet if needed. Then, I will make the use of technology, fun and learning—not to make it so complex and fun-free that my students fall asleep in my class. I will encourage my students to be as creative as possible when it comes to using technology for the academic writing purposes. I will make it more engaging by increasing accessibility and encouraging individualized learning to best address actual needs.

**Technology Integration**

Once asked about the ways to integrate technology in the academic writing classroom, the teachers pointed out several factors required for effective integration which are reported in the chart below:

![Figure 5. Factors to be considered in technology integration.](chart.png)
Need Analysis and Contextual Factors

As indicated by one of the participants need analysis was necessary for technology integration. This participant believed that before using technology in the classroom, the teacher should have a precise and comprehensive picture of students’ needs, technological knowledge, interest, and also the context in which technology would be used. Naser discussed this idea in detail in his interview:

First, program developer should have a need assessment and they should not imagine that if a technology worked great in Australia, it will also work in Afghanistan. They need to know the context, they need to know our rate of access to Internet, computers, how much maintenance will be provided, how better our tools could be updated, what would be the expense of new technologies. For example, if they want to hold a Zoom class, what are tools necessary and how the maintenance should be provided. We even have electricity problem that is no longer as an issue in other contexts. Policy makers and those who are in the position to make decision they should take into account the realities on the ground. In addition to that, it is not case only for English language teachers but also other teachers in different disciplines. [To be more exact] Need analysis should be taken from teachers, students (within academic environment and about future job), and inside institution.

Naser further elaborated the idea of contextual factors by describing his real teaching experiences about technology integration and use. He said he had assigned a project to his American students and the idea was to provide intracultural communication between Afghans and Americans. The point was Afghan students needed to be directly in contact with American students; therefore, he and his colleague in Appalachian State University tried Skype at the beginning. They wanted the students to have face to face video interactions, but the problem was
the time difference. The technology also didn’t work as they were not able to track each individual student’s participation in that project. As a result, they turned to Google Docs as they posted a question, and then had all the students in both countries post their comments. This didn’t function well either because students were not familiar with Google Docs in both contexts. Furthermore, it was also deprived students of face-to-face verbal interactions. However, when they started a Facebook private group, almost all students were equally and actively engaged, and they responded in a quick manner and the teachers could also track their levels of participation. So, they had that Aha Moment! Naser said.

Selecting Particular Technology

Participants also illustrated selection of a particular technology depended on the level of support it brought in and the extent it could help to implement that curriculum. For instance, Ebrahim stated, if he was developing an academic writing curriculum for a particular group of students, he had to look for what programs and software and what technology helped him apply and cover course content.

Presenting the Content

After selecting a particular technology, participants indicated that technology could be used to present the materials to the students. It could also promote conversation to identify errors and discuss rhetorical analysis. For instance, Jacob indicated when giving a lecture, especially when he was showing examples, he would definitely pull up a presentation on screen and show the students in the beginning of writing to get them start thinking about their topic or theme. In a similar vein, Ahmed decided to use digital samples of poor and strong writing and had students identify genre conventions, grammatical error, and the like.
Practicing Learned Skills

After presenting the content, the participants said the students needed to be given opportunities to practice writing skills that they had learned. Educational technology came in to provide a plethora of meaningful exercises so that students could connect the theory to the practice. Jacob remarked that even a simple form of technology had offered that opportunity. He stated, “[teachers] could definitely use writing software on PCs to practice writing and to exercise. Computers could be used to type which was very important one, so I thought it could be used much in the beginning, during lesson and after giving feedback.”

Connecting Technology With Assessment

Participants in the study indicated that technology could help teachers with assessment. It facilitated the process and made giving feedback much easier. For instance, Soharb said, he used a projector in the university to give students’ feedback on their writing. Similarly, Ahmed used PowerPoint while having the attention of whole class to observe how he was pinpointing the errors and illustrating where correction was required.

Understanding Intended/Desired Effects of Technology Use

Participants indicated the ways they identified whether use of a technology had intended/desired effects in academic writing classroom. They included the ways as followed: achieving learning objectives, covering planned content, evaluating students' performance, fast paced learning, high level of students' interaction, and finally, students' positive perception toward technology. The effects and their frequencies are noted in table below.
Table 14

*Understanding Intended/Desired Effects of Technology Use*

<table>
<thead>
<tr>
<th></th>
<th>Achieving learning objectives</th>
<th>Covering planned content</th>
<th>Evaluating students' performance</th>
<th>Fast paced learning</th>
<th>High level of students' interaction</th>
<th>Students' positive perception toward technology</th>
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**Chapter Summary**

In this study, academic writing instructors had a pretty high level of TPACK (Mean= 4), but average level of technological knowledge (Mean=3.7). By running t-test, it was proved that there was no connection between the instructors’ TPACK and their teaching experiences. Similarly, through applying ANOVA in SPSS software, it was shown that there was no relationship between instructors’ TPACK and their educational level.

Most instructors had positive perceptions towards educational technology use. They also noted several barriers to technology integration in their writing classrooms. The major barriers were students' lack of technological knowledge, teachers' lack of technological knowledge, need for professional development programs, and unavailability of educational technology.

Instructors also reported major selection criteria for using technology such as: practicality, available technological knowledge, training, and support, and finally, accessibility. They also stated that they consider several factors to integrate technology including need...
analysis, considering contextual factors, selecting of technology, presenting content, practicing the learned skills, and connecting technology with assessment.

Teacher participants also stated the factors by which they could identify whether use of particular technology had intended effects or not. The major factors included achieving learning objectives, covering planned content, and evaluating students' performance.
CHAPTER 5
DISCUSSION

As it was revealed in the results chapter, academic writing teachers reported pretty high levels in the technological knowledge and TPACK. The possible reason for such a high value in TPACK would be teachers’ Western educational background in which they were exposed various types of educational technology and they observed technology integration in practice.

There was, however, no strong relationship between teaching experiences and TPACK. Likewise, there was no solid connection between the instructors’ level of education and TPACK. The last two findings were not in harmony with other previous research that proved strong relationships between variables of education, teaching experiences, and TPACK (Jang & Tsai, 2013; Sun, Strobel, & Newby, 2017; Turgut, 2017). Possible reasons for such an insignificant association between variables might be due to the small size of participants in the study, and contextual barriers that did not allow the teachers to integrate technology as they learned during their education and teaching experiences.

Most instructors had a positive perception of technology use in this study. They affirmed about the use of technology, but they were sometimes challenged because of contextual barriers such as unavailability of educational technologies and not having access to required support and resources. Perception was an important predicator in planned behavior. According to Sadaf, Newby, and Ertmer (2016), robust indicators of teachers’ actual behavior toward use of technology were technology usefulness, their self-efficacy during use of technology, and their students’ perception toward technology. In a similar vein, other researchers noticed that some instructors were not able to use technology due to lack of access to technological support and resources. Ertmer et al. (2012) also stated that the teachers’ attitude about use of technology and its relevancy to students’ learning played an important role for integrating technology in their
teaching. As a result, academic writing instructors in this study may have a better planned behavior and transform their intention of technology use into action if they gained a high level of expectancy-value about technology being used in the classrooms, had access to technological support, identified students’ perception, and improved their self-efficacy in use of technology as it was suggested by Sadaf, Newby, and Ertmer (2016).

According to findings in the result chapter, academic writing instructors encountered a number of challenges along the way of integrating technology in public universities such as absence of technology integration as an institutional goal, digital divide, need for professional development programs, negative perception toward educational technology, resistance toward technology use, students' lack of technological knowledge, teachers' lack of technological knowledge and TPACK, technical problems, and unavailability of educational technology. Due to these contextual, internal, and external barriers, the teachers were not able to integrate technology effectively. The example to prove this point was the SAMR technology integration model, which didn’t work because of not having access to technologies, resources, and support (e.g., internet, laptops etc.).

**Dynamic Context-Specific Process Model for Technology Integration**

Based on the findings in the results section, this study proposes a dynamic context-specific process model for integrating technology. The integration is a dynamic process that requires implementing subsequent stages: conducting need and situational analysis, considering contextual factors, selecting particular educational technology in the classroom, exploring technological and pedagogical possibilities, implementing technological and pedagogical decisions, connecting technology with the assessment process, reevaluating technological pedagogical decisions, and getting professional development training. This process model is
another way to look at technology integration and may help both teachers and administrators to integrate technology into teaching and learning.

Figure 6. Effective technology integration in academic writing process.

In this study, Naser, one of the participants, noted that needs assessment was important, and teachers might consider it when integrating technology and developing training programs. Needs assessment is a systematic process which helps to identify existing capabilities and gaps and manage the resources for effective implementation of strategies (Altschuld & Kumar, 2010). It also paves the way for teachers to understand what they need to prepare for effective technology integration (Jackson, 2013). Needs assessment may include various parameters such as demographics, self-reported skill sets, the instructor’s perception, challenges, institutional technological efforts, required resources and training, and other realities of the context. Such a needs assessment tool would be inclusive and applicable for a variety of contexts (O'Reilly,
However, need assessment can be extended to three levels to ensure that education technology works and that its integration meets intended/desired outcomes. The levels include: needs analysis of curriculum, technology requirements and affordances, and finally, institutional support and interoperability. Such inclusiveness helps for quality learning and sustainable practices (Gosper, Woo, Muir, Dudley, & Nakazawa, 2007). Moreover, analysis of the data then leads to determining educational goals.

Once instructors designate educational goals to integrate technology into instruction and content, the next step would be considering realities of the context and desired learning outcomes as reiterated by the participants in this study. Integrating learning goals and encouraging vicarious experiences along the way could help the instructors improve their self-efficacy toward educational technology use (Wang, 2003). Learning objectives, in general, accommodate certain parameters. McCloskey (2013) discusses PRIMAC parameters for designing learning objectives. First, learning objectives promote growth, meaning content is at the appropriate level (ZPD). Then, learning objectives are relevant to the context. In other words, they fit into the context of the course and students. Later, learning objectives are integrated with content, meaning they are connected with what students are learning in other academic courses. After that, they are measurable and observable. In other words, good learning objectives result in precisely fair authentic assessment. Subsequently, they are aligned to the standards and goals. Learning objectives address what has been identified as significant for students’ academic success. Finally, they are clear and student-friendly. Besides considering these parameters, the instructors can use Bloom’s taxonomy in order to encompass different levels of learning and thinking.

After setting educational goals in terms of technology integration, the instructors select appropriate technology for delivering instruction and the content. Similarly, academic writing
instructors in this study noted a number of criteria for wise selection of technologies including practicality, accessibility, available technologies, support, and so forth. The selection of technologies for learning and teaching may also include other parameters. Collis and Moonen (2001) have suggested a model called 4 Es in which they explain the factors that affect the selection of educational technology: environment (context of use), educational effectiveness, ease of use, and finally, level of engagement. Gosper, Woo, Muir, Dudley, and Nakazawa (2007) have also expanded the view of the selection process and discussed it through three levels of efforts such as institutional support and interoperability analysis, curriculum analysis, and requirements of the technology and its affordances.

Once the technology is selected, instructors explore all the possibilities and affordances they may use in the academic writing classroom. This may include a wide spectrum of possibilities such as presenting the content, practicing learned skills, managing learning and teaching, social networking use, community building; assigning and monitoring collaborative tasks (Boyle & Cook, 2004).

Exploring all the possibilities and affordances, teachers can then implement those informed choices, related technologies, and TPACK. However, there are some conditions to facilitate the implementation of educational technologies. Those conditions include level of satisfaction, time, emotional investment, required skills, knowledge, high level of engagement, commitment, and management (Ely, 1999). The implementation of technology requires authenticity in learning activities as well. It develops learning and engages students in the process as they show more emotional investment toward learning and authentic technological practices (Snape & Fox-Turnbull, 2013).
While implementing technology, instructors ensure they integrate technology into the assessment of the learning process as well as stated by participants in this study. Writing assessment offers information about students’ writing ability and its related literature focuses on assessment in a contextual manner. It, therefore, occurs within the social context and leads to social consequences (Neal, 2001). In other words, the process includes: a. using different instructional strategies to enhance the knowledge of a complex construct (ex: students’ academic writing ability), b. making informed decisions on the basis of collected data, and c. finally, identifying the impact of our decision on learners and the teacher. The process should be transformative, and it transforms both students and teachers. Hence, it requires holding up to a multilingual, multicultural, and multidisciplinary approach (Poe, 2104). It also pursues and promotes social justice and provide much advanced opportunities for all diverse groups to be involved in (Poe, Inoue, & Elliot, 2018).

After conducting a needs analysis, setting educational goals, selecting technology, exploring affordances, implementing technology, and connecting to the assessment process, it is now time to reevaluate the decisions about technology and related instructional strategies instructors employed in the academic writing classrooms. The sources for reevaluating the decisions may include, students’ learning performance, teacher’s and students’ perception, extent of barriers and challenges in using technology, and during and after-math reflection (field observation, journals, etc.).

In this study, the instructors stated the fact that effective technology integration requires professional development program. In other words, the teachers would be able to use technology and integrate it effectively with their instructional strategies and courses’ content if they have high level of TPACK. Therefore, professional development programs that focus on technology
integration would help them a lot (Koh, 2018). However, considering the realities on the ground and study of context in the first place benefit the programs. In other words, it might be more effective if the programs negate a one-size-fits-all perspective and hold up to a context-specific approach (Koehler & Mishra, 2009, Harvey & Caro, 2017). Meantime, the trainees will get more benefits in terms of practicality and relatedness of the training if the programs are aligned and consistent with the discipline and department. Such approach ensures that the teacher participants receive context and disciplinary specific training during the program (Shendy, Bream & Elliot, 2017).

There are a number of ways that professional development programs might enhance teachers’ knowledge of technology integration. First, by exposing teacher participants to mentor’s actual technology integration persistently over an extended time and having them experience it, they would gain a higher level of metacognitive awareness about the process (Turgut, 2017). The activities in the program play an important role to support teachers’ TPACK development (Andzenge, 2018) and effective syntactic activity design may also help the instructors gain a better knowledge of technology integration (Papanikolaou, Makri, & Roussos, 2017). The interrelationship between accommodation and assimilation assist teachers to modify the current practices and engage in new educational tools and related strategies. Furthermore, mixed feelings of opportunities and fear to cooperate with colleagues are driving forces for teachers to integrate technology into their instruction (Andzenge, 2018). Moreover, engaging teacher participants to evaluate the digital content of the course, explore technological and pedagogical possibilities, and employ critical thinking skills in the process will help teachers to gain a better judgment in technology integration (Xie, Kim, Cheng, & Luthy, 2017). Having the teachers write reflective journals about what they observe, experience, and perform in terms of
technology integration may also assist them to have a better understanding of the process and their performance along the way (Lu, 2014).

**Future Implications**

Integrating technology into instruction and content is important for academic writing courses at the college level. However, such integration requires careful planning and necessary knowledge on both sides: the instructor and the students. The implications for future research might benefit both teachers and educators when integrating technology or exploring the process. The implications are derived from the results of this study. They are as follows:

- This study focused only on measuring the instructors’ technology knowledge and overlapping area (TPACK). However, TPACK is a complex model of technology integration. Inclusion of all its constituents in their areas of pedagogy, content, and technology may help teachers and researchers receive a better image of integration. Therefore, it would be more inclusive if educators study the instructors’ technology integration knowledge and skills more deeply by measuring all the constituents and proposing possible ways to empower teachers in the process. The other constituents are as follows: Pedagogical knowledge (PK), Content Knowledge (CK), Technological Pedagogical Knowledge (CPK), Technological Content Knowledge (TCK), and Pedagogical Content Knowledge (PCK) (Turgut, 2017). The results of such an investigation might be used to develop more effective professional development programs to address actual needs of teacher participants for effective technology integration in academic writing classrooms.

- The process-model suggested in this study did not accommodate technological, pedagogical, and content knowledge as a core framework within the entire process.
Future researchers may enhance the process-model by placing different TPACK constituents within the process, suggesting effective ways to address the instructors’ actual needs in integrating technology, and ensuring that TPACK is contextualized based on the realities on grounds.

- Instructors’ perception of educational technology plays a significant role in shaping their behavior in terms of technology integration, but this study did not measure the teachers’ perception. Assessing instructors’ perception may help both teachers and professional development program designers to understand factors that influence instructors’ beliefs about technology and the ways to enhance positive perceptions amid the teachers, and in turn, correct their behavior toward the integration. Future educators may study and follow expectancy-value theory to measure academic writing instructors’ perception of technology use. The theory explains that behavior is the result of expectancies that a person may have toward an object (e.g. technology), and the value of the goal that a person is moving toward. The constructs of the theory are as follows: intrinsic value, extrinsic utility value, attainment, and cost value (Chen, 2010).

- This study revealed that technology integration is highly dependent of contextual factors and the integration sometimes is interrupted by various barriers such as lack of access to technological resources, internet, teachers’ lack of knowledge, and so forth. The educators may also focus on other technology integration model such as SAMR, which seems to endure some deficits in terms of being more product-oriented rather than focusing on process, negating context of use, and being inefficient in its categorized structure (Hamilton, Rosenberg, & Akcaoglu, 2016).
Reflection

At the end of this thesis project, I would like to take a step back, reflect, and look at the process I have gone through within my writing. I have come to realize that I started from knowing just a little about technology integration in the context of Afghanistan and ended up with a keen desire to explore and tap into the topic of integration more to reach a better understanding of the context and use of technology in my home country. I came to know that there is still a long road to take to reach a full understanding, and I am still miles away from that destination.

I also learned how teachers felt about challenges and problems in their classrooms when integrating technology and how they worked hard to make changes, help their students improve their writing, but unfortunately, contextual barriers often blocked their educational and strategic planning in this regard. Also, I was moved by the participants’ feelings about their work to change and the extent they cared about their students. I have learned that teachers should carefully consider students’ needs and contextual realities on the ground when integrating technology.

I was excited about the number of well-formed technology integration models proposed by different researchers, yet these models did not accommodate every factor involved in technology use within different contexts. My process-model also is not perfect. It is just another way to understand at technology integration.

I would like to refer to my favorite topic of discussion during my studies in the MA TESOL program at Indiana University of Pennsylvania because I think it might also fit into the technology integration process. It is a post-method pedagogy which was proposed by Kumaravadivelu in 1994. This method was a call to change prescribed teaching methods and
improve the quality of teaching the English language by considering three parameters: particularity, practicality, and possibility. The Afghan higher education institutions might benefit from considering particular goals, particular contents, particular teaching strategies, particular contextual factors, and particular groups of learners when integrating technology. Moreover, the teachers at these universities understand the practical contexts of their institutions better than outside experts, so these teachers can help theorize what they practice and practice what they theorize in order to optimize teaching and learning. Also, the teachers might consider how technology can create new possibilities for teaching and learning. Teachers can search for new ways to use technology to raise socio-political awareness and to have students discuss power relations and discursive narratives around socio-cultural issues in order to shape their identities and ultimately, achieve social transformation.
References


Appendix A

Questionnaire

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<th>N</th>
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<td>I can easily learn technology.</td>
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<tr>
<td>2</td>
<td>I am aware of new educational technologies.</td>
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<td>3</td>
<td>I can troubleshoot technological problems by my own.</td>
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<td>4</td>
<td>I use technology regularly.</td>
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<tr>
<td>5</td>
<td>I’ve given enough chances by administrators to use various technologies in academic writing class.</td>
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<tr>
<td>6</td>
<td>I possess necessary skills to use technology in academic writing class.</td>
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<tr>
<td>7</td>
<td>I can use different technologies to assess my students’ learning process and report the results.</td>
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<td>8</td>
<td>I can use different technologies to provide timely and accurate feedback to my students in academic writing course.</td>
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<tr>
<td>9</td>
<td>I can use writing software and applications that ranges from planning and drafting to publishing.</td>
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<td>10</td>
<td>I understand copyright laws related to technology.</td>
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Technological Pedagogical Content Knowledge

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<tr>
<td>11</td>
<td>I am able to teach academic writing in which I integrate designated content, technologies and teaching approaches.</td>
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<td>12</td>
<td>I am able to construct my academic course objectives based on Blooms’ taxonomy considering appropriate content, pedagogical approaches and technology.</td>
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<td>13</td>
<td>I am able to choose different technologies in academic writing course that are aligned with course objectives, content and instructions.</td>
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<tr>
<td>14</td>
<td>I am able to implement strategies to integrate the particular content, technologies and teaching approaches.</td>
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<td>15</td>
<td>I can use different educational technologies to tie content, instruction and assessment with students’ academic needs.</td>
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Context for Teaching with Technology

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<td>16</td>
<td>I understand my university’s goals for integrating technology into the writing classrooms.</td>
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<tr>
<td>17</td>
<td>I agree with my university’s goal(s) in regard to technology.</td>
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<tr>
<td>18</td>
<td>I feel confident I can adapt my pedagogy to meet my university goal.</td>
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<tr>
<td>19</td>
<td>I have concern about meeting this goal.</td>
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<td>20</td>
<td>I will need help to meet the goal.</td>
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Top down Imposition of Technology in Teaching

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<td>21</td>
<td>My university has adequate tech resources.</td>
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<td>22</td>
<td>My university provides adequate tech support.</td>
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Technology Use and recommendations

1. What educational technology do you use in your academic writing course?

2. What are the most important challenges you encounter while integrating technology in teaching academic writing?

3. What do you suggest to effectively integrate educational technology in academic writing class?
Appendix B

Interview

Full Name: --------------------------------------
Gender: -----------------------------------------
Years of Teaching Experience: -------------------

1. What are the most important challenges that you encounter as you teach academic writing course?
2. What do you think of technology, a tool or resource?
3. How do you feel when you use technology?
4. How do you use technology to engage students in writing classrooms?
5. What are your criteria for selecting a particular technology?
6. How do you integrate technology in instruction and curriculum related to teaching writing?
7. What are the new technologies available in your institution that you can use to teach writing?
8. What technologies are you familiar to teach academic writing with?
9. What challenges have you observed/ perceive teacher face while introduced to new technology? How did they overcome them? How do you respond to or manage such institutional effort?
10. Are there any training for the application of newly introduced technologies in your institution?
11. How do you understand an integration of particular technology has intended or desired effects? How do you know it works or doesn’t work?
12. What technology do you wish to have at your institution to teach writing courses more effectively?
13. If you had access to your favorite technology for teaching writing, how would you utilize that?
14. Why would you turn to technology-integrated classrooms?
Appendix C

Site Permission

Site Permission Letter

{ELCLC, Herat University}
{10/27/2018}

Dear IRB board,

Based on my review of the proposed research by Mr. Jawad Golzar, I give permission for him to conduct the study entitled “Educational Technology Use at Afghan Public Universities: Transitional Change, Integration & Effective Contextualized Model” in ELCLC, Herat University. As part of this study, I authorize the researcher(s) to recruit participants, conduct questionnaire and interviews. Individuals’ participation will be voluntary and at their own discretion.

We understand that the research will include recruiting instructors on a voluntary basis to fill up questionnaire, and participate in the interview.

This authorization covers the time period of {__Nov, 2018 to Feb, 2019__}.

I confirm that I am authorized to approve research in this setting.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the research team without permission from the researcher(s) and Indiana University of Pennsylvania, IRB team.

Sincerely,

Ahmad Javid Rahimi

Email: javid.aelesp@gmail.com
Mobile: 00937991034111

ELCLC
November 21, 2018

Dear Jawad Golzar:

Your proposed research project, “Educational Technology Use at Afghan Public Universities: Transitional Change, Integration & Effective Contextualized Model,” (Log No. 18-251) has been reviewed by the IRB and is approved. In accordance with 45CFR46.101 and IUP Policy, your project is exempt from continuing review. This approval does not supersede or obviate compliance with any other University requirements, including, but not limited to, enrollment, degree completion deadlines, topic approval, and conduct of university-affiliated activities.

You should read all of this letter, as it contains important information about conducting your study.

Now that your project has been approved by the IRB, there are elements of the Federal Regulations to which you must attend. IUP adheres to these regulations strictly:

1. You must conduct your study exactly as it was approved by the IRB.
2. Any additions or changes in procedures must be approved by the IRB before they are implemented.
3. You must notify the IRB promptly of any events that affect the safety or well-being of subjects.
4. You must notify the IRB promptly of any modifications of your study or other responses that are necessitated by any events reported in items 2 or 3.

The IRB may review or audit your project at random or for cause. In accordance with IUP Policy and Federal Regulation (45CFR46.113), the Board may suspend or terminate your project if your project has not been conducted as approved or if other difficulties are detected.

Although your human subjects review process is complete, the School of Graduate Studies and Research requires submission and approval of a Research Topic Approval Form (RTAF) before you can begin your research. If you have not yet submitted your RTAF, the form can be found at http://www.iup.edu/page.aspx?id=91683.
While not under the purview of the IRB, researchers are responsible for adhering to US copyright law when using existing scales, survey items, or other works in the conduct of research. Information regarding copyright law and compliance at IUP, including links to sample permission request letters, can be found at http://www.iup.edu/page.aspx?id=165526.

I wish you success as you pursue this important endeavor.

Sincerely,

Jennifer Roberts, Ph.D.
Chairperson, Institutional Review Board for the Protection of Human Subjects
Professor of Criminology

JLR:bkj

Cc: Dr. Gian Pagnucci, Faculty Advisor
Appendix E

Additional Figures

Figure 7. Students' gender gap and growth pattern 2003-2017.

Figure 8. University faculty gender gap and growth pattern 2003-2017.
Technological Levels of Use

Transformation

Redefinition
Tech allows for the creation of new tasks, previously inconceivable
Multimedia-based projects/presentations

Modification
Tech allows for significant task redesign
Blogs/forums for sharing student work

Augmentation
Tech acts as direct tool substitute, with functional improvement
PDF embedded links
Put video online

Substitution
Tech acts as direct tool substitute, with no functional change
PDF file
Video

Enhancement

Figure 9: SAMR model by Puentedura (2006).