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Technology Integration Experiences of Teachers

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Abstract

Teachers have a crucial role in ensuring the long-term viability of education. Technology integration is linked to teachers' capacity to adjust to ever-changing technologies that are relevant to classrooms. This research aims to examine how instructors use technology into their lessons and learning experiences. Qualitative research approaches were used for this purpose. Four public secondary school teachers who self-identified as proficient in integrating technology participated in the research. Their subject areas varied. The majority of instructors cited the pursuit of educational excellence as their primary motivation for implementing technology into their classrooms, and the study's findings supported this view. Teachers at IT schools also said they had help from friends and family as well as the MoNE and other internet sites. Access to technology and instructors' level of expertise with it were the most common sources of friction for educators throughout technology integration procedures.

Keywords: technology integration, sustainability, technology.

Introduction:

Sustainable development has many components, and one of them is the integration of technology (Yarime et al., 2012; Poueze-vara, Mekhael and Darcy, 2014; Armenta, Serrano, Cabrera, & Conte, 2012). According to Polly, Mims, Shepherd, and Inan (2010) and Ili ko and Ignatjeva (2014), technology integration activities should also be viewed from a sustainability perspective. When it comes to educational sustainability, technological innovation is a key supplier. Institutions of higher learning may greatly benefit from instructional initiatives and long-term sustainability via the integration and innovation of technology (Uwasu, Yabar, Hara, Shimoda, & Saijo, 2009). A necessity for technological innovation is the establishment of infrastructure and the integration of technology to education. Thus, there is a foundation for integrating technology into the realm of education due to the impacts of ICTs on student learning, educational quality, and sustainable development. Teachers have a crucial role in ensuring the long-term viability of education. The capacity of educators to adjust to new technologies that are relevant to classroom

settings is linked to the incorporation of technology (Bentham, 2013; Ortega & Fuentes, 2015). Several components and indicators make up the multi-dimensional structure of technology integration in education. Thus, both human and technical resources are issues impacting technology integration. The term "technology integration" refers to the coordinated and productive use of technological tools into every facet of educational processes,

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including classrooms, lesson plans, and underlying systems (Yalin, Karadeniz & S¸ahin, 2007).During technology integration processes, a variety of issues may cause problems including teachersí limited access to the Internet (Clark, 2006; Bauer & Kenton, 2005), time constraints (Yalin, Karadeniz, & S¸ahin, 2007; Zhao & Frank, 2003; Mumtaz, 2000), teachersí lack of basic technological skills (Hew & Brush, 2007), teacher attitudes towards technology integration (Hew & Brush, 2007; Lim & Khine, 2006; Ertmer, 2005; Ili ko & Ignatjeva, 2014), school culture (Hu, Clark, & Ma, 2007), and. te.a.chersí ne.ed.f.or professional development regarding technology integration (Gˆktas¸, Yildirim, & Yildirim, 2009; Gülbahar & Güven, 2008; Koehler & Mishra, 2005; Glazer, Hannifin, &Reference: Song (2005). However, according to Brinkerhoff (2006), Hew & Brush (2007), Lim (2007), Oncu, Delialioglu, & Brown (2008), Shuldman (2004), Yalin, Karadeniz, & S¸ahin (2007), and Zhao (2007), the most significant barriers to effective technology integration arise from teachers' inadequate knowledge, skills, or efficacies. Çiftçi, Tas¸kaya ve Alemdar (2013) and Korkmaz ve Usta (2010) are two studies that identify problems associated with instructors' technology usage and their incompetence or ineffectiveness. Therefore, this scenario highlights the importance of teacher efficacies as a factor affecting the efficacy of technology integration in the classroom.Teacher candidates should be prepared to use technology effectively in their own classrooms through pre-service education. This will help address common issues like a lack of basic skills, negative attitudes, and the need for professional development, as well as empower them to make effective use of technology in their own teaching. Hence, it's crucial thatInstitutions that prepare teachers provide high-quality instruction to future educators while also providing them with subject-specific technical resources (Erdemir, Bakirci, & Eyduran,in the year 2009. Having technology teaching as a standalone subject, however, leaves little opportunity for students in teacher preparation programs to use what they learn outside of the classroom, according to the research. Van Melle, Cimellaro, & Shulha (2003) stress the need of pre-service teachers acquiring subject-related technology abilities. Furthermore, studies have shown that students' performance and development of higher-order thinking abilities are both enhanced in classrooms where technology is seamlessly incorporated with the curriculum (Lim & Ching, 2004).The researchers set out to learn about the beginnings and present stages of technology integration from educators who report feeling successful in their roles as a result of their own use of technology, as well as the challenges they face, the solutions they find, and the advice they would give to their peers in the field. Elements of an interview study were used in this qualitative research project. Four Turkish secondary school teachers from the 2015–2016 academic year participated in the research. They all work in the Meram District of the Konya Province. Inclusion criteria were satisfied using a variety of approaches. In order to identify instructors who use technology effectively and at a high level, the researchers first sought advice from the school's IT teacher. The information technology instructor listed four educators from various disciplines. After notifying the instructors of the study, the researchers contacted them to get their thoughts on the extent to which they felt technology was being used in the classroom. In order to validate their self-perception, the instructors who see themselves as competent and efficient participated in the research by completing the educational technology standards scale developed by Çoklar (2008). Table 1 provides the participants' characteristics.

Table1
Participant Characteristics

Teachers	Gender	Subject Matters	The total score	(max 205, min 41)
Mine	Female	Turkish		186 (High-Level)
Fatih	Male	Science		193 (High-Level)
Deniz	Female	Culture of Religion and Morality		173 (High-Level)
Akif	Male	English		194 (High-Level)

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The participating educators came from four distinct academic backgrounds: English, Turkish, Science, and Culture of Religion and Morality (CoRM). Regarding the genders of the participants, there were two females and two men. According to their results on the Educational Technology Standards Scale (ETSS), all of the participants were categorized as advanced users of technology.The researchers created a semi-structured interview form to find out how much technology the instructors were using. One way researchers attempt to understand the participant is via interview, which is a kind of qualitative data collecting.viewpoints on certain issues by means of their responses to predetermined questions (Yil-direm and Simsek (2011). In keeping with the study's objectives, researchers crafted questions that inquired about the technologies used by educators throughout the course of student learning. Before conducting any interviews, the researchers made sure to brief the participants on the study's goals and methodology and got their verbal and written agreement. Inductive analysis methods were used to examine the data. Researchers started by organizing and transcribing interview recordings. The researcher conducted a comprehensive evaluation of the data to establish a broad understanding after verifying the correctness of the transcripts. The data was then partitioned, with each partition assigned a name and a unique code. In order to assess the reliability of the codes, a qualitative researcher and an expert in educational technology looked over the previously defined topics and codes. The researchers finalized the codes and themes after considering professional comments and recommendations. Gay, Mills, & Airasian (2006) and Cresweell (2005) used verbatim quotations to bolster preexisting ideas and arrive at conclusions. Findings from the Research School and Participant Teacher AttributesCoded from "Mine" to "Akif," the following are some broad descriptions of the educators.I (Teacher 1) am a Turkish language instructor with a degree from the Faculty of Education's Turkish Teaching Department. She was also qualified to teach since she had a master's degree in the field. At the age of 29, she had been a teacher for eight years. Using a computer, a projector, and PowerPoint, she made her presentation.With eight years of experience in the classroom, Fatih (Teacher 2) taught science. According to him, technology is an absolute need in his field. He went on to say that he was enthusiastic about technology, particularly computers. He boasted about his extensive familiarity with office packet systems and the Internet. He went on to say that he often utilized PowerPoint presentations and animations he found online to create presentations for his classes.Culture, Religion, and Morality (CoRM) instructor Deniz (Teacher 3) was a woman of 38 years old. She claimed to have used computers and the Internet in the classroom during her ten years of expertise.A 43-year-old guy named Akif (Teacher 4) had been an English teacher for 20 years, beginning in 1995. He gave himself high marks for being an adept user of technology, and he spoke about how often he used presentations and online videos.

Educators' First Steps in Utilizing Educational Technology

Considering the participants' motivations for starting to use technology, the assistance they got, challenges they encountered, and solutions they found, this session outlined the participants' early steps in using technology.How and Why Teachers Became Involved with TechnologyIt would indicate that a common goal among the participants using technology is to enhance the quality of training. Mine (Turkish) said that when she was first starting out, she saw that pupils forget a lot of the material very quickly. So, she decided to include visuals with verbal information, drawing on a literature study that showed how the number of senses engaged improved retention. She accomplished this by making simultaneous use of visual and aural material using PowerPoint and Prezi. She said that her choice to continue employing technology was driven by the increasing student engagement and favorable outcomes. The use of technology

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became essential, according to Akif (English), as he recognized that pupils preferred visual information and had better visual recall. In an effort to make classes more engaging and help students remember what they learned, he said he chose to embrace technology. According to Deniz (CoRM), the abundance of information accessible online piqued her interest in using technology. She said that while her first encounters mostly included using web resources, she eventually developed the ability to independently create various types of products. She spoke about how the significance of student engagement and the function of her own resources (such as puzzles) became clear to her. According to Fatih (Science), his instruction relied heavily on visual material and the provision of clear examples. He went on to say that he began making extensive use of the internet to locate a variety of items in order to provide concreteness. When integrating new technologies, support plays a crucial role (Buabeng-Andoh, 2012; Ertmer, 2005). Within this framework, the researchers sought for information on the organizations, individuals, and materials that offered assistance to the educators. Fatih (Science) said that his close buddy and IT instructor are always there for him. Within this framework, he identified a single individual as a crucial channel for receiving assistance. Although each instructor highlighted distinct forms of assistance, both Mine (Turkish) and Akif (English) brought up the institution's amenities at MoNE. Mine (Turkish) said that she was helped by the Education Information Network (EIN), which was established by MoNE. When used as a digital library, EIN really shines. Akif (English) countered by highlighting the Ministry's offerings in professional development courses for educators, including those in instructional material design and computer science. Institutional support may therefore be considered to come in several kinds. Individual efforts were more important, according to Deniz (CORM), who felt that institutional assistance was inadequate. Using websites to obtain help was something she brought up.The Difficulties Educators Had When First Using New Technologies Additionally, we looked at the issues that instructors have while using technology in the classroom for the first time. According to mine (Turkish), the biggest concernShe had difficulties in accessing the Internet, particularly with educational resources.online resources. According to Fatih, locating instructional materials was not an issue; nevertheless, a major limitation for him was the scarcity of physical resources like projectors. Similarly, Deniz (CoRM) highlights the significant issue of insufficient projectors. The discomfort of the physical surroundings and the impossibility of instructors to afford such technology were also mentioned by Akif (English) with the lack of tangible instruments. The time it takes to set up the projector and computer every time, as well as the effort needed to get the classroom ready to utilize technology, are some of the negative consequences of portable equipment that he stated.The instructors proposed a number of solutions to the issues, including mobile internet connectivity, students bringing their own laptops to class, buying a personal projector, and asking for a classroom that is reserved for the class. In particular, the final option is clearly designed with the administrator in mind.Utilization of Technology in Pedagogical PracticesThe educators shared details on how they use technology into every step of the learning process, from planning to assessment. It seems like the Internet is a prevalent reference source based on what they have said.According to mine, she started by looking for presentations online, then verified whether they were fit for the pupils' level. whether none were, she would create her own. At the start of each class period, she brought up the idea of using various things to grab the interest of the kids.To get the kids interested in the subject, I show them an animation, video, or cartoon as I start the class. I capture the interest of the kids by doing this. Along with being an expert organizer, she made sure to include an opening slide into her presentations. When a lesson is being introduced, she uses PowerPoint to outline the topics that

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would be discussed. The individual in question boasted about her extensive use of hyperlinks to enhance presentations with visual and audio material. As for assessment, they utilized EIN unit quizzes and had students answer them on the smart board.

While acknowledging the need of pre-class preparation, Fatih (Science) contended that his course was well-suited to include technology. While getting ready, he detailed his routines for utilizing video sharing sites and his own collection of instructive animations. Along with the use of technology in enhancing training, he emphasized the need of time management: "Since our sessions are restricted to 40-minute intervals, we time and distribute the information across classes." Additionally, he emphasized the need to verbalize the essential topic. We utilize technology to help learning after we build the foundation for the lesson.In terms of evaluation and assessment, the participant said that he sometimes utilized presentations and paper-based exams. He preferred presentations and the web for inquiries with integrated images.According to Deniz (CoRM), she emphasized the significance of the issue by using video technology to evoke emotions in her students:First, I'll provide an example. For example, we're talking about unhealthy routines. To get the kids thinking about the issue, I want to show them a movie depicting the condition of someone who has been drinking or using drugs.Here, she stresses the need of getting ready for class. Despite her claims that she frequently used her own video archives and the Internet (youtube.com) to create presentations for use in education and assessment, she emphasized the significance of videos.Although Akif admitted to using the Internet to research topics and come up with ideas, he exercised caution when it came to the material he found there:During class preparation, we use the internet. While I am researching a subject or putting together a paper, I use the internet. This requires extreme caution on our part. You are well aware that the internet is rife with uncontrolled, thoughtless data. Although it helps us prepare for class, picking accurate and appropriate material takes a lot of effort. In order to broaden our perspectives and horizons.

According to the participant, he used technological resources including images, videos, and presentations to pique the interest of the pupils in the subject. (An engaging visual or auditory element at the beginning of the class is a great way to pique students' attention and get things off to a good start.) Technology aids instructors during the presentation phase by facilitating the delivery of the subject, the inclusion of details and specific examples, and the ability to revisit the material at one's leisure via the use of videos, he continued:We make use of it [technology] throughout the presentation phase to simplify the transmission of information, provide specifics and elaboration, and provide examples. Now let's think about how we shop. We can visually demonstrate the process of shopping, the tenses and terminology utilized, and more via the use of step-by-step films. We may also choose to pause and play it again. Head,Department of Computer Science and engineering, Nawab Shah Alam Khan College of Engineering and Technology, Hyderabad, 500059

Similarly to the other participants, Akif stated he used technology to present questions and other evaluation materials, and create scenarios based on materials to evaluate students.

The teachersí statements regarding their use of technology indicate that although they use technology for students, their approach to technology integration is teacher- centered rather than student-centered. While their practices seem to adopt a student- centered use of technology for the purposes of strengthening attention, improving reten- tion, and activating more senses; none of the participants mentioned using technology to elicit student-student interaction and foster collaboration.Current Technology Integration Problems of the Teacherss the participants consider themselves competent in technology integration now, the researchers asked

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them about the problems they encounter in the current practices. In this context, Mine (Turkish) mentioned being unable to use technology as much as it was desired due to the pressure to complete mandatory curriculum content.... Since Turkish is a five-hour course, I can use technology effectively in the three of these five hours at most. I would love to make an effective use of technology in all five hours, yet the curriculum I have to cover prevents me.Fatih (Science) told that sometimes the level of studentsí knowledge had a substantial influence upon technology integration.Let me put it this way, I donít know if this is something our education system brings about, yet when studentsí levels are not suitable you cannot easily manage the situation. I mean, my purpose of using presentation is to first cover the entire presentation, and then utilize visuals to summarize, to repeatÖ When we cannot complete the former, there is no time for the latter.Deniz (CoRM) pointed out physical facilities as an obstacle to technology integr- ation: Of course, I did my best with available facilities. But, sadly, there are things I could not accomplish: ...Due to some physical constraints, we have some issues about this matter. Akif (English) referred to the time required to prepare materials as a significant issue for technology integration:...for example, a presentation prepared by another teacher may not work for me. Therefore, I have to prepare my own presentation in line with my teaching style to make my lesson more active, more teachable. And this takes time...

Discussion

Mortensen (2001) maintained that sustainability is of importance for teacher educ- ation. He claimed that teachers should be trained to keep up with the rapid developments in technology. In this context, technology integration becomes a key concept for sustain- ability of educational processes. Teachers are fundamentally important in the technology integration processes because without their active involvement, integration does not happen. In line with that, Gooler, Kautzer, & Knuth (2000) argued that the most important role in the effective use of technology in education belongs to teachers. In this context, our teachers who claimed to use computers effectively and practice a good level of technology use participated in the study. The following section provides the findings.

All of the teachers who claimed to use technology conceptualize technology as digital tools, materials, and media. The technologies and materials they use include computer, smart board, projector, PowerPoint presentations, animations, videos, and the Internet. These technological resources are in line with the ones emphasized by MoNE of Turkey through the FATIH Project. MoNE (2012) explained the aims of the FATIH Project as providing equal opportunity in education through information and communication technologies, improving technological infrastructure of the schools, and enhancing the quality of learning outcomes by providing access to technology and materials. For this reason, it is understandable that the teachers mentioned digital techn- ologies and materials when they were talking about technology integration processes. This situation may also be related to the perceived usefulness of such tools and materials. In his Technology Acceptance Model, Davis (1989) defined perceived usefulness as the level of oneís belief that the use of a system will improve his/her performance at work. The participantsí main reason to use technology was to improve the quality of education. Their reasons to start using technology for educational purposes included enhancing retention, improving the effect through visuals, activating more senses, eliciting active student participation, employing rich online resources, and providing concrete examples. These opinions of the teachers of varying experience may be formed due to their perceived usefulness (Davis, 1989) and their ability to think about technology integration (Tsai & Chai, 2012). Tsai and Chai (2012) suggest that teachersí ability to think about technology integration should be supported. The teachers, based on their experience, pointed to the probable usefulness of

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technology as their starting points. Likewise, the teachersí opinions and the opinions from other research studies show similarities. Dursun (2006) argued that knowledge retention is important and teachers have to create learning environments that utilize visual and auditory learning resourcesand address multiple senses.The participantsí sources of support during the initial phases of technology integr- ation included close friend(s), information technology teacher, MoNE (content and materials on EIN, in-service education courses etc.), and information on the Internet. According to Ertmer (2005) and Ortega and Fuentes (2015), support given to teachers is a critical means to handle obstacles of technology integration. Moreover, Andoh (2012) emphasized the importance of leadership support and technical support in the success of ICT integration. The participants of the study preferred friends and the Internet as their sources of support due to its accessibility and practicality.Among the problems encountered during the initial phases of integration, the par- ticipants named the access to the Internet and educational websites, limited number of projectors, unsuitable physical environment, high cost of technological equipment, and waisting classroom time in carrying and setting up the equipment. In other words, access to technology and using it were the problems faced at the beginning. In addition to the physical problems in the initial phase, the current problems of the teachers are centered on educational processes such as failure to teach the topic within the classroom time, failure to cover the entire curriculum, and insufficient level of students. Therefore, it can be concluded that the teachersí initial problems on technology integration developed form accessing and using technology to pedagogy focused issues. Hixon & Buckenmeyer (2009) regarded technical problems as external factors influencing technology integration, and claimed that as technological tools evolve new problems are likely to emerge. Ç .akir &Yildirim (2009) found similar results in their study with pre-service teachers.The teachersí processes of integrating technology into lessons were examined in four phases: prior to class, introduction, during instruction, and evaluation. Prior to class preparations included finding presentations to suit the topic and editing them or creating new presentations if there is none available, and finding documents, videos and animations online. Similarly, Wastiau et al. (2013) argued that the Internet has become one of the most important resources in classroom preparation and finding educational materials. Education Information Network (EIN) component of the FATIH Project being run by MoNE also aims to provide materials for teachers and activate the potential of the Internet also in the course of learning events (MoNE, 2012). As to finding learning materials, the Internet is an important resource for teachers (Fu, 2013).During the introduction to the class phase, the participants employed technology to draw studentsí attention through materials, explain the instructional goals through slides, and activate emotions through videos. During the instruction phase, the particip- ants preferred to use technology to effectively utilize presentations and other materials, simultaneously use visual and auditory content, support and enrich instruction with animations and videos, ease instruction through presentations, provide concreteness, and repeat the content as needed. As to the evaluation phase, the teachers stated that they utilize unit tests on EIN and other educational websites, use projectors to elicit active participation, and include videos and visuals in various forms of assessment. All sorts of the educational use of technology mentioned here show the purposes of using educational technologies (Aldunate & Nussbaum 2013; Bentham & Sharpe, 2013; Cheung & Slavin 2013; Fu, 2013; Kabadayi, 2016; Makrakis, Kostoulas-Makrakis, 2012). Furthermore, Bentham (2013) maintained that the use of technology makes information and concepts more tangible so that it helps teaching and comprehension. Wastia et al. (2013) mentioned reusability and repeatability of the content, providing concrete examples, and providing equal opportunity for students as far as the

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advantages of using computers in education are concerned. Therefore, the results of the current study comply with the ways of using technology stated in the literature.

Taken together, the results of the study indicate that the teachers participating in the study employ a teacher-centered approach to technology integration rather than a student-centered approach. Pipere, Veisson, & Salite (2015) and Bentham (2013), Hixon & Buckenmeyer (2009) suggest that technology integration work for students; for this reason, teachers should surpass traditional education through the use of technology and plan the processes considering mainly students.

The teacher shed light on the use of technology in technology integration based on their experiences. In their statements, online resources and MoNE facilities like EIN became prevalent. Therefore, in-service training programs to introduce the facilities to other teachers and to increase their awareness would be beneficial. As the subject matter has an influence on the technology integration processes, the best practices of teachers successful in integration may serve as examples to other teachers. New studies examining this situation would also be beneficial. Technology integration, ideally, focuses on students; however, the results of this study showed that the teachers follow a teacher-centered approach to integration. In this respect, the teachers can also be informed about how to properly integrate technology, following a student-centered approach.

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