

Views of Pre-Service Teachers on Internet Supported Learning

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ABSTRACT

Having knowledge of computer hardware is one of the skill sets of computer teachers that allows them to understand and predict hardware problems in advance. Therefore, computer hardware courses are often added as required courses in pre-service teacher curricula in Instructional Technology Departments. This study aimed to understand the effectiveness of one such course with the integration of internet technologies. 44 students enrolled in this course in a western public university in Turkey. Students used an online learning environment in addition to a traditional face to face classroom setting for 14 weeks during the 2015-2016 Fall Semester. Participants were divided into two groups. One of the groups, which was called Bloggers, wrote all their learning experiences and outcomes in their blog postings. The other group, which was called Webbers, designed a website to share their knowledge. Both groups also shared other new technologies which could help them to improve their professional skills. During the 14-week explanatory case study, data were collected from students' reflection papers, forum postings, researcher's journal and learning outcomes. Data were analyzed by following content analysis strategies. The results show that for the majority of students, integrating internet technologies into traditional classroom settings motivated them to engage more during the course. However, some of students who created websites noted that the additional responsibilities were overwhelming. Creating a website and maintaining it were challenges for them. On the other hand, students who were blogging their learning experiences noted that they had fun during the course. They also highlighted that writing comments for each blog posting helped them to learn more by sharing their knowledge. Both groups thought that they enriched their content knowledge during the course.

INTRODUCTION

The emerging technologies that have been integrated into education are often labelled as different pedagogical approaches, such as blended learning, hybrid classes, flipped learning, etc. Bates and Sangra (2011) mention that combining these technologies and approaches, such as occurs with blended learning, has ushered in a new era of strategies in higher education. Educators, especially in higher education, have more opportunities to apply emerging technologies into educational settings.

Nowadays, students have become comfortable with using new and different technological tools and applications in universities. This is a natural outcome for them as digital natives. Also, students in the new era have become not only tech-savvy people in their lives, but also learners who would like to use technology in learning processes. Sanders & Morrison (2007) suggest teachers need to be aware of students' needs and expectations in the use of technology in education. It can seem quite a challenge to know and decide how those needs can be met, but there are many educational tools that can help in educational settings. Blessinger and Wankel (2012) mention that wikis, blogs, and WebQuests allow teachers to increase students' engagements in learning environments. Using other tools such as websites, social media, and Web2.0 tools assist to enhance learning processes (Ifinedo, 2017; Sarsar, Başbay and Başbay, 2015). Sarsar, Kaval, Klasser & Güneri (2016) highlight that digital materials might also increase students' motivation.

Goh and Kale (2016) define Web 2.0 as a read-and-write web which gives an opportunity for users to create and edit content on the web. The number of tools for those contributions has increased in recent years, as blogs, websites, social media tools, etc become more common. These all may be effective online teaching tools for student-oriented learning environments. Internet technologies may contribute to meaningful learning by supporting collaborative and interactive learning environments (Lee & Tsai, 2010). But unless teachers also take advantage of the affordances of these technologies by using appropriate pedagogies, their potential may be

wasted. Therefore, teachers need to integrate different instructional strategies and various technologies for efficient teaching and learning (Chang et al., 2015; Santos, García and Díaz, 2016).

Blogs have strong potential to be used in educational purposes (Ifinedo, 2017). Kim (2008) suggests that blogs are affordable and user-friendly for teachers to use in educational settings. Blogs provide an easy-to-use platform for not only teachers but also students; therefore blogs could have an important role in teaching and learning by effectively using text, images, videos, audio, and so on for learning. Blogs enhance content by using those media, and improve communications skills by allowing discussions of blog posts. Students might use their critical skills by posting their learning experiences, while reading, and commenting on their teachers' or peers' blog posts.

Web2.0 technologies such as blogs, websites, and wikis can increase students' motivation and create more dynamic learning situations (Blessinger and Wankel, 2012). Internet technologies in educational settings occupy very important part of the learning process. Santos and his colleagues (2016) mention the internet as a powerful and motivational "weapon" in various educational levels.

Those technologies can be meaningful by using them to create an effective learning environment, which is one of responsibilities of instructors. Therefore instructors should be aware of creating learning activities to enhance meaningful interaction and effective learning (Blessinger and Wankel, 2012).

Using web technologies in educational settings can increase students' satisfaction and provide effective learning environments (Jeong, Ramírez-Gómez & González-Gómez, 2017; Gaines, 2017). Therefore, the incorporation of online teaching and learning tools may bring different perspectives of both teachers' teaching processes and students' learning processes. Kosloski (2016) highlights that available online tools give many advantages such as enriching learning environments and letting students focus on the task. He also mentions that those tools offer active learning environments for all level of learners.

Acquaro's (2017) study results show that the most effective online tools for students should require less set up, less organization and less activity. In other words, the increasing complexity of using online tools may decrease the effectiveness of the teaching and learning process. However, complex tools that are just slightly beyond learner capability may be used with proper scaffolding from the teacher. This finding shows similarity to Vygotsky's (1978) theory of the zone of proximal development. It refers to completing or performing a task with learners' own skills or with guidance. That is, if the task is complex to learn, learners may not use their own skills to find the learning path, so it may decrease willingness of learning. But at the same time, learners' gains may be increased by supporting them in tasks which they could not complete just on their own, but can complete with some assistance.

Gaines (2017) suggests that technology supported learning environments in higher education should be studied annually to understand the effectiveness of learning process. This study attempts to do that. It investigates learners' views on internet supported learning by utilizing internet technologies in a computer hardware course. It also examines how these technologies affect student engagement.

METHODOLOGY

This explanatory case study aimed to understand students' views on the effectiveness of a computer hardware course with the integration of internet technologies. Case studies allow for exploration of contemporary contexts or events (Sarsar, 2014). A case study can be limited to a single individual, a group of individuals, courses, events, programs, etc. (Bassegy, 1999; Yin, 2009). By nature most case studies are qualitative (Yin, 2009) and require qualitative analysis strategies to make data more meaningful. A single case study mainly has a single unit of analysis which is defined as the case in the study. This study defines the case as the course of Computer Hardware.

Data Collection Tools

Data were collected by (i) students' reflection papers, (ii) blog/website forum posts, (iii) researcher's journal, and (iv) learning outcomes.

- (i) Students' reflection papers: Students were asked to write their reflection on the course itself and their learning process. Students were to write their reflection papers voluntarily without an award in any grade or bonus event.
- (ii) Blog/Website forum posts: Both groups (bloggers and webbers) had opportunities to type their comments in both environments. The comment box under each blog post and webpage were collected as data.

- (iii) Researcher’s Journal: The lead researcher took notes during the study. The journal included important states which might affect research.
- (iv) Learning outcomes: Students created presentations and recorded their own content with related videos to upload on blogs and websites. They also wrote and structured the content of information, and shared the results of their research processes for assigned topics for each student. The relation between design and content of websites and blogs were also considered as learning outcomes.

Data Analysis

All data were analyzed qualitatively. Content analysis was employed by analyzing (i) students` reflection papers, (ii) blog/website posts (iii) researcher’s journal, (iv) learning outcomes.

Data were analyzed by following content analysis strategies. Schreier (2012) describes steps for content analysis after selecting materials as (i) creating a code frame, (ii) categorization of coding (iii) testing coding frame, (iv) modifying coding frame, (v) shaping main analysis, and (vi) instructing a strong interpretation.

During this study, researchers followed the steps below which were completed twice. (See Figure 1)

Step 1. Classification: The raw data were classified.

Step 2. Coding process: A code sheet was created by body/unit of text such as (i) students` reflection papers, (ii) blog/website posts, (iii) researcher’s journal, and (iv) learning outcomes.

Step 3. Categorization: The categories were defined by using the code sheet.

Step 4. Theme: The categorization phase was addressed as literature-related themes.

In the first round, data were analyzed by researchers. During the second round, a sample part of data was analyzed by three other experts independently. In this round, a sample of four coded data sets were compared and the code frame was finalized. After data coding was finished, the data were abstracted.

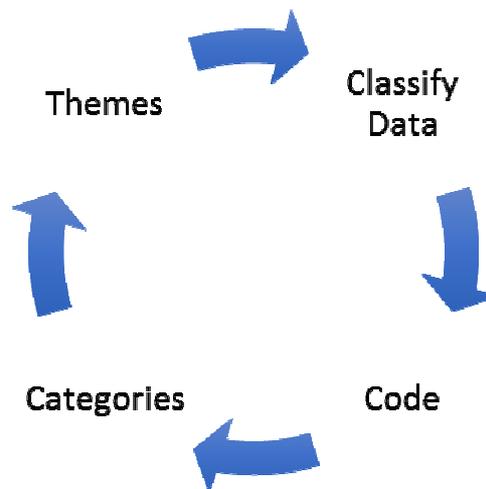


Figure 1: Data Analysis Process

Participants

There were 44 sophomore students who enrolled in a computer hardware course at a western public university in Turkey. The nature of the course had two groups which were assigned randomly. The course content included the computer and its hardware system. The course aimed to explain computer components and computer hardware problems seen in professional environments and the practical solutions of those problems.

Design

The Computer Hardware course was designed as a 14-week course. Students used an online learning environment in addition to a traditional face to face classroom setting for 14 weeks during the 2015-2016 Fall Semester (See Figure2).

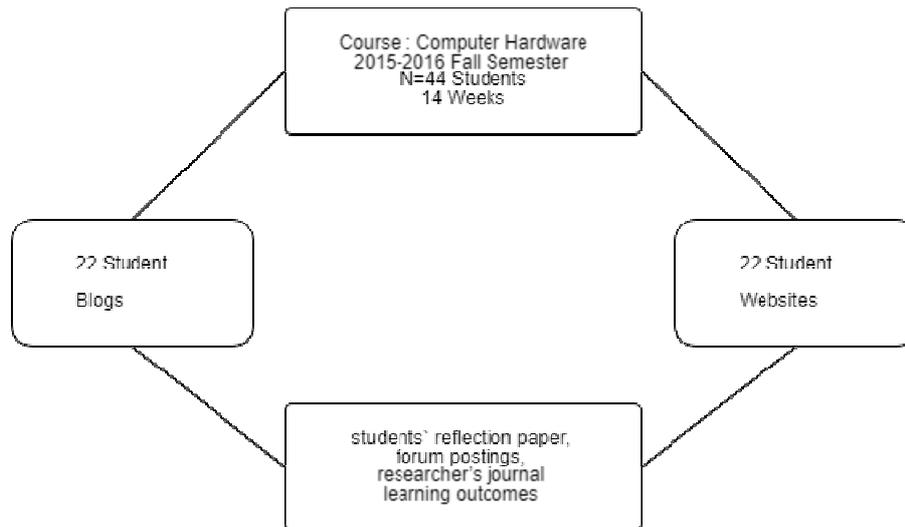


Figure 2: Research Design

During the first week of the study participants were randomly divided into two groups and were given instruction for the course explaining the expectations of the course. One of the groups, which was called Bloggers, wrote all their learning experiences, research results, and outcomes in their blog posts. They created a blog account for the course and each student had free access to write, read, and edit blog posts. Students created content and designated additional materials to enrich their contents. The other group, which was called Webbers, designed a website to share their knowledge. They created their own websites and delivered the content via their internet pages. Each group wrote on different topics related to computer hardware for each week. The last week of the study, students were asked to write their own reflections on their learning process and the way the course was delivered.

RESULTS

The results of this study fell into two categories. These categories are students' views and researchers' view on internet-supported learning environments.

Students' view on internet supported learning environment

The majority of students felt that integrating internet technologies into traditional classroom settings motivated them to engage more during the course. As seen in Table X, the first two most common themes of students on internet supported learning environment were the same for both groups. They reflected that using different internet tools for learning was motivating and fun.

Table1: Students' Views on Internet Supported Tools

Bloggers	Webbers
Motivation	Motivation
Fun	Fun
Easy-to-use	Learning new technology
Teamwork	Increase problem solving skills
	Team work
	Challenges
	Overwhelmed

However, some of the students who created websites noted that the additional responsibilities were overwhelming. Webbers considered that creating a website and maintaining it were challenging for them. They also mentioned that although learning new technologies was fun, it forced them to deal with additional sets of problems. However, they believe that handling those problems also helped them to improve their problem-solving skills (See Table 1).

Both Bloggers and Webbers mentioned that writing comments for each post helped them to learn more by sharing and discussion. However, some of the students in the Bloggers group highlighted that they had fun

during the course, but after the 5th week, using the blog was too easy and sometimes writing there became boring.

S1B: “...blogging was great option for us to work on. I feel that I am on the right track to do my homework by blogging. It motives me to do more.”

S1W: “I cannot say creating a website is easy but the designing process and showing what we have done to the other classmates was so great. I was willing to write more. It was like an online exhibit, fun and colorful.”

S2W: “I had a hard time to learn some codes and designing tools. I was working on creating the website more than doing my task”

S3B: “If I ask a question of myself about how fun it was to post our weekly task in our blog? The answer is definitely YES. I am writing my topic and adding my comments to enrich my context. It is a great motivation to have fun”

S6W: “Sometimes I was hoping to see the end of the course. I got tired and so frustrating during the course. I was enjoying creating the website but I felt that I was really tired to do all the duties on my own.”

S17W: “I hadn’t had those many problems in any of my courses before. I was dealing with not only technical problems but also designing problems. I felt that I became an expert by solving all those problems. At the end, I learned a lot, as much as I enjoyed the course”

S19B: “The teamwork had a great value for my learning. I took my own responsibilities during the submission and posting process. I needed a hand and teamwork made everything easier. I wouldn’t expect more...”

At the end of the course, it was asked that both the groups share their experiences on internet-supported learning in a forum environment. Students mentioned more thoughts on internet-supported learning in their reflection papers. Their thoughts were categorized into four topics. These topics are (i) motivation, (ii) learning, (iii) teamwork, and (iv) course requirement. See Figure 3 below.

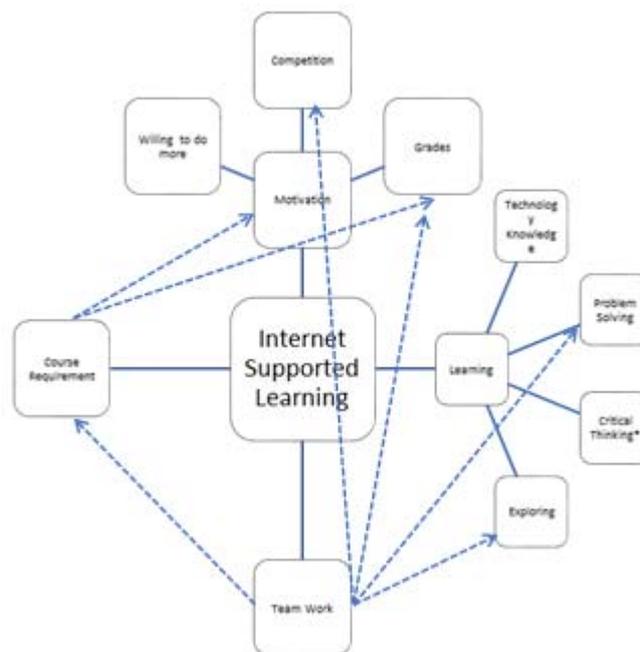


Figure 3: Student Reflections on Internet-Supported Learning

Students mentioned that they would like to add learning materials as much as they could. The majority of students stated that adding new learning materials and making the learning environment effective were motivating. Also, each week tasks were completed by different groups of students in a competition to show their design skills to their classmates. Grades were one of the strongest motivations for students. Although they did consider that grades were important to pass the course by meeting course requirements, they noted that other learning outcomes such as blogging, creating websites, and teamwork were more important than grades. They also said that facing problems let them improve their problem-solving skills and increase their exploring ability to find the right solution to each problem in a correct matter.

S7B: *“I was so confused at the beginning of the course, because I didn’t get why our teacher was giving those task and extra responsibilities. Moreover, I was worried about completing the course. Middle of the semester all my thoughts changed ”*

S7W: *“...this course was more than a designing a website or finishing our homework. I realized that it had own philosophy. I learned by doing. While achieving my goals I saw many challenges, but overcoming all the problems made me a great problem solver. I can say now, there is nothing to be scared of if you know how to think...”*

S18B: *“Teamwork was great but being responsible for others’ attitudes was not that nice. Because not all of us were focusing on real problems”*

Researchers’ view on internet-supported learning environment

According to notes in the researcher’s journal, students had different challenges during the study. It was observed that each group had their own difficulties and boundaries. The lead researcher reflected that students stopped enjoying writing blogs around mid-semester because they started to think it was a monotonous process to perform. They also complained that posting something in blogs was very easy and didn’t improve their technical skills. It was not expected that students were looking for more challenges. Although bloggers mentioned they learned a lot during the semester, they were willing to have more challenging tasks. On the other hand, webbers mentioned their learning experiences very often. Although they were complaining about HTML codes, they believed that they learned more than they had expected. They also reflected that weekly changes in websites were time consuming, because they needed to create a new page for each topic weekly. Even though they believed that they learned new technologies while doing their classwork, each week came with an extra challenge to accomplish. It was clearly observed that Webbers were exploring new things to add and enrich their websites more than bloggers. Bloggers found the simplest ways to create and maintain their blogs. They typically did not add anything new for the purpose of enriching their blogs.

RJ3: *“Blogger are doing great and they submit their homework on time, but webbers haven’t obeyed the timing rules. When I ask them the reasons, they mention additional works let them delay”*

RJ5: *“... some students in Blogger group asked to give them another task instead of blogging. The said that blogging was too easy and getting boring...”*

RJ6: *“Bloggers started to complain.”*

RJ7: *“This week, webbers had issues on HTML coding and they said they need extra time to submit homework. Although I gave them extra time’, they couldn’t finish on time. But after the submission, I realized that they add some HTML codes in their assignment to show what they learned while doing their task”*

RJ13: *“we are almost the end of semester, webbers are happy to learn some extra stuff, but being familiar with coding was a problem. On the other hand, bloggers were willing to add more into their blogs. I think either too easy or too difficult tasks are not encouraging students learn more. ”*

Learning Outcomes

Overall, learning outcomes based on students’ blogs and websites were assessed by three experts. Experts views on learning outcomes categorized them into four categories: (i) Content, (ii) Effectiveness, (iii) Innovative, and (iv) Design.

Table2: Students’ Evaluation on Using Internet Supported Tools

Bloggers	webbers
Effectiveness	Innovative
Content	Design
Design	Content
Innovative	Effectiveness

As seen Table 2, three experts stated that bloggers focused on effectiveness and content more than webbers. Webbers focused on more innovativeness and designing than Bloggers. Those results also show that students in the webbers' group spent more time in designing and trying some new technologies to enrich their content. Therefore, they might decrease the priority of effectiveness of the teaching and learning process. On the other hand, bloggers mentioned that they had limited options for designing blogs and adding new learning materials to develop the content.

S3B: “...could just change the colors of blog and wanted to add additional videos and couple of images but it turned to a messy design. Then we gave up...”

S8W: “...I felt that I spent time more than was necessary for designing my website page. It was taking time forever. That is why I was sending all my assignments at the last moment.”

S14W: “he[her teammate]was so busy to find new things to add our website to make it more fancier than others. However we were having a hard time to write our task almost each week. Anyway our website page was perfect...”

S18B: “... were doing our task very quick and sending to blog and that is it...”

S22B: “...tried to change the design of our blog but it didn't work. It didn't allow us to do those changes as we wanted.”

DISCUSSION

This exploratory case study investigated the students' perspectives on internet supported learning in a course at a large public university. Technology enriched the educational outcomes of the students. However, this doesn't mean that using many technological tools in educational settings improves students' learning skills. On the contrary, doing so ineffectively may decrease students' motivation and their willingness to learn. Learning new technologies in education might create an extra stress for students while doing their main tasks related to the course. As the Yerkes-Dodson law in 1908 states, arousal stress and performance have a significant relationship (Deshpande and Kawane,1982). That means stress might affect the performance in both positive and negative ways. Therefore, instructors should be aware that learning new and unfamiliar technologies might increase stress in a negative way. Moreover, it might be thought that if the task was too easy to do, it might decrease the stress more than expected, therefore task might be boring or attract no willingness to complete it. This might be the reason why students mentioned that blogging became boring after mid-semester. This also might be interpreted with Vygotsky's Zone of Proximal Development theory which refers to completing or performing a task at the edge of a learner's own skills or with guidance (Vygotsky, 1978). That means if the task is too easy it causes boredom which causes students to learn less. On the contrary, if the task is too difficult, it makes them overwhelmed which also causes them to learn less. Likewise, bloggers found the simplest ways to create and maintain their blogs. They typically did not add anything new while creating their blogs. This might be a limitation for blogs, because they have a fast-publish (write and upload) process. Acquaro (2017) stated that students would prefer to have less complicated tasks. Therefore, very simple or too difficult tasks reduce the efficiency of the course. Instructors should be careful while giving specific tasks to students.

Students mentioned that when learning and working together to do their tasks better a competition started in a positive way. This unplanned competition created a motivation for completing their task weekly. It might be interpreted that competition encouraged them to put more effort into completing their tasks. Lin and Young

(2017) mentioned similar results in their study. They highlighted that competitions let students collaborate and encourage each other.

This study shows that teaching with internet technologies can have some challenges, such as being difficult-to use, unfamiliarity, too easy tasks and so on. It can also lead to real benefits such as increased motivation and problem-solving skills. Instructors should choose the most effective tools considering by students' skills, and prior knowledge. They should carefully monitor student's progress and continuously adjust the task load and difficulty level to ensure that students are working in the optimal zone for learning.

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