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Are We Better without Technology?

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Abstract

The purpose of this study was to determine the effect of visual element and technology supported teaching upon perceived instructor behaviors by pre-service teachers. In accordance with this purpose, whereas the lessons were lectured without benefiting from visual elements and technology in a traditional way with the students included in the control group, in the experimental group, the lessons were lectured using visual elements and technology (PowerPoint, video, etc.) with the pre-service teachers included. In this research that was carried out using an experimental method, "Perceived Instructor Behaviors Scale" developed by Kara, İzci, Köksalan and Zelyurt (2015) was used as pre-application and post-application. According to the findings, visual elements and technology-assisted teaching caused pre-service teachers to perceive their instructors as calmer, more adequate and authoritative. When the probable negative effects of an authoritative instructor upon the students were considered, should sufficient and calm perception of the instructor be supported or should calmness and sufficiency of the instructor be preferred by avoiding technology-assisted teaching which makes the teaching process mechanic?

Keywords: perceived instructor behaviors, educational technology, learning and teaching environments, computer-assisted instruction, authoritative instructor, insufficient instructor

1. Introduction

Students come to their classroom with different grades of motivation. Pintrich (2003) categorized the components of this motivation into three basic groups as "values, expectations, and feelings" (cited by Du Boulay, 2011). Homogeneity of the classrooms in terms of motivation is not possible and classrooms turn into learning-teaching environments hard to be controlled having co-efficacy as students diversify according to instructor, methods and techniques the instructor use, their own learning style and strategy and type of intelligence. Negative-positive effects of these variables upon learners result in different cognitive and affective reactions of the learners (Afzal & Robinson, 2011). Teachers have recently had vast opportunities in order to minimize the differences in communicating the content to their learners, to keep all individuals in the classroom at optimum motivation levels, and to provide the students who use different learning styles and strategies by benefiting from technology. They also use the same opportunities for simulating the synchronization between cognitive, affective and psychosomatic dimensions coexisting in natural learning process proportionally with their pedo-technological competences.

It is accepted that the teacher and environment-induced disadvantageous situations against some learners are possible to be prevented through enhanced learning experiences. Indeed, in the literature, there are numerous studies indicating the favorable effects of using various educational equipment from computer-assisted teaching to using audio and visual tools upon dependent variables such as academic success (Akdağ & Tok, 2010; Bayturan, 2011; Güven, & Sülün, 2012; Önal & Demir, 2013; Teyfur, 2010; Şan, 2008) and attitude towards courses (Bayturan, 2011; Güven & Sülün, 2012; Uzel & Hangül, 2010). As a result of these studies carried out at various levels and on different disciplines within the framework of a program, it could be noticed that technology-assisted teaching created a relatively and statistically significant difference compared to the traditional methods.

Computer-assisted teaching technologies have recently been popularized from somatic-weighted domains such as physical education (Goggin, Finkenberg, & Morrow, 1997) to theoretical, and philosophical disciplines; suggestions and criticisms related to benefiting from the advantages of human-human communication and

maintaining the strengths of traditional education have not been regarded as should be by the researchers for nearly half a century (Adams, 2006; Clark, 2008; Ely, 1970; Ely, 1996; Harlin & Brown, 2007; Reeves, Herrington & Oliver, 2005; Tufte, 2003). A very limited number of studies were noticed to indicate that the control groups lectured with the traditional method had higher success and more positive attitudes towards learning than the experimental groups managed with technology-supported methods (Cosgun-Ögeyik, 2016).

While the popularity of communicating any kind of content at any grade and level using computer technologies has been continuing, the studies in the literature carried out including majority of the possible dependent variables indicate that the outputs differ according to the grades and disciplines (Roehling & Trent-Brown, 2011). It has been noticed that use of technology changed reliability of instructors in accordance with use frequency and quality, whereas reliability up to medium and high levels increased proportionally and linearly, the same increase is not observed as the use of technology increases (Schrodt & Turman, 2005; Schrodt & Witt, 2006), and the highest affection level towards the instructors is measured for the ones using technology at a medium rate (Witt & Schrodt, 2006).

Experimental studies provide the chance of controlling the noisy variables upon independent variables. Because majority of the studies in the literature have a descriptive characteristic, they may miss the quality and extent of the results that emerge in academic success and attitudes of learners related to the relevant disciplines arises from the use of technology. It is beyond argument that combinations of management, content, teacher characteristics, student properties, and frequency and quality of technology use result in different achievements and attitudes (Lowyck, 2014). In the literature, they are also studies indicating that efficient teaching could be fulfilled as result of conscious pedagogical implementations rather than technology alone (Fillion, Limayem, Laferrière, & Mantha, 2010; Smith, Chen, Johnson, O'Brien & Huang-DeVoss, 2012); the methods used in teaching are directly associated with the characteristics of the teacher (Johnson, & McElroy, 2010; Koehler, Newby, & Besser, 2017; Marzano & Brown, 2009), the variables create different results among the members of the same group and the same individuals may not react the same way to the same variables at different times (Younie & Leask, 2013); and type, quality and amount of use create different advantages and disadvantages (Yılmazel & Şahin, 2009). When the use of technology is considered from the learners' viewpoint, it was noticed that there are studies reporting that displeasure and resistance to technology start from undergraduate degree and increase at higher grades. In one of these studies, De Silva (2014, pp. xvii-xix), mentions that learners resist against new methods to an extent because they believe that the technology ignores traditional learning methods.

As specific to PowerPoint, Tufte (2003, p. 24) qualified this as a drug "stupefying the individuals, decreasing the quality and security in communication, and making the user boring" in terms of technology use. However, the role of user was not also ignored here. The other studies accepting these deficiencies of PowerPoint also regard these deficiencies to arise from user (Harden, 2008; Harlin & Brown, 2007, Yılmazel & Şahin, 2009).

It has been noticed that the studies have been frequently on fulfilling the acquisitions of skills in cognitive domain in terms of technology use in education, and the balance has been constantly tried to be disturbed in terms of expediting the more easily measurable cognitive skills. Du Bolay (2011) draws attention to the fact that disclaiming other dimensions in order to keep productivity in a domain is fallacious. On the other hand, Calvo and D'Mello (2011, pp. 3-6) mention that the effects of components for organizing the learning experiences upon attitude and perception could reveal different results, any teaching process ignoring other domains could limit learning as a "cold cognitive process," and the learners with perfect cognitive skills but whose emotional domain is ignored could not fulfill the success expected from them in presenting their cognitive skills.

Although we accepted that teachers adapt the technology to their own methodologies, technology also causes changes in various extents in teachers' ways of communicating the content. Considering that the communication skills of teachers could shape affective dynamics of the learning environments, how the methods employed during the teaching process affect the perception of the instructors by the students is a fact to be clarified. In descriptive studies, it is suggested that the speed of teaching process increases in PowerPoint and similar assisted presentations (Yılmazel-Şahin, 2009; Younie & Leask, 2013, p. 43), learning becomes more monotonous and mechanic; and accordingly the affective dimension of learning disappeares (Tufte, 2003), teachers do not behave tolerantly, though rarely (Yılmazel-Şahin, 2009), and accordingly teacher could not be sure of recording the feedback received from the students. However, as the situations disposed by the teachers during a traditional presentation is not mentioned, it remains uncertain whether this is a technology-origin role change and what the role of teacher as one of the fundamental variables in this perception is.

In this research, the effect of visually and technology-assisted teaching upon perceived instructor behaviors was investigated on students who had the opportunity of being a teacher after completing the pedagogical formation

training offered by Faculty of Education subsequent to their undergraduate study.

1.1 The Problem Statement

The fundamental problem of this research was determined as "What is the effect of visual element and technology-assisted teaching on students' perceived instructor behaviors?" Within the framework of this fundamental problem, the sub-problems below were determined.

1.2 Sub-Problems

The present quasi-experimental study sought answers to the following sub-problems;

- In pre-application, was there a significant difference between control and experimental groups in perception of instructor behaviors?

- In post-application, was there a significant difference between control and experimental groups in perception of instructor behaviors?

- Was there a significant difference in perception of instructor behaviors between pre- and post-applications in control groups?

- Was there a significant difference in perception of instructor behaviors between pre- and post-applications in experimental groups?

2. Methods

2.1 Process Order

The present study was carried out using quasi-experimental design (control- and experimental-group pre- test and post-test design). Both in pre-test and post-test, two similar scales were performed to the control and experimental groups at the beginning and end of the study. The researcher tried to determine how visually and technology-assisted teaching affected the perception of instructor behaviors by pre-service teachers. Within the framework of pedagogical formation training offered by İnönü University Faculty of Education for the students who requested to be teacher subsequent to the formation training after completing a 4-year undergraduate education in Turkey. Indeed, it is also available for the already-employed people with the intension of changing to teaching career and is an alternative teacher certification program (Ünişen, 2015; Ünişen & Polat, 2016). The program includes the courses of Introduction to educational Sciences, Teaching Principles and Methods, Assessment and Measurement in Education, Educational Psychology and Classroom Management are lectured in the first term, and the courses of Special Teaching Methods, Teaching Technologies and Material Design, one elective course and Teaching Practice (internship) are lectured in the second term. Each term lasts for 14 weeks. The research was carried out during the first term, and the pre-application was made at the end of the third week. The students were given chance to recognize their instructor. The post-application was administered at the end of the 12^{th} week. In summer term of 2016-2017 academic year, 240 students attended the course. The researcher lectured the course of Assessment and Measurement in eight groups including 30 students each. In order to minimize the effect of course time (morning/noon) upon perceived behaviors of the instructor, the researcher included first, third, fifth and seventh group students into the control group, and second, fourth and sixth group students into the experimental group. In the control group, the courses were lectured in traditional methods; books, lesson notes and blackboard were used. In the experimental group, while lecturing the courses, the instructors used PowerPoint slides, drawings, pictures, and graphics from the computers most and rarely the blackboard. In the experimental group, the students watched videos, though little. In the research, there were 120 students in the control and experimental groups. After the scale was administered to both groups, forms of the students who participated into the pre-application but not to the post-application and forms of the students with missing data were excluded; as a result, 88 students were included into the control group, of which 37,5% were male and 62,5% were female; and 93 students were included into the experimental group32,3% were male and 67,7% were female; they ranged from 21 to 28 in age with average of 23,2 years. In this study, the researcher examined how the independent variable as visually and technology-assisted teaching affected the dependent variable as learners' perceived instructor behaviors.

2.2 Data Collection and Analysis

In this research, the Scale of Perceived Instructor Behaviors was used in order to determine the perceived instructor behaviors. The scale included 24 items; and developed by Kara, İzci, Köksalan and Zelyurt (2015). The KMO of the scale was measured .928 and Cronbach's Alpha coefficient was .907 in development process. The scale towards perceived instructor behaviors was a Likert type scale, and included four sub-dimensions as insufficient instructor, nervous instructor, understanding instructor, and authoritative instructor. The five-point

grading scale was used as I agree: 5, I partly agree: 4; I have no opinion: 3; I disagree: 2; I totally disagree: 1. The answers to the negative questions were recorded reversely from I totally disagree (1) to I totally agree (5). In perceived instructor behaviors scale, 4 negative expressions were coded reversely. Reliability and validity test results obtained from the scale and performed to the students as pre-test and post-test were presented in Table 1. As could be seen in Table 1, it was concluded that the scale was valid and reliable in post-application as well as in the pre-application.

Table 1. Reliability and validity of the pre- and post-application

	Pre-application	Post-application
KMO	,845	,904
Bartlett's Test of Sphericity	1496,184	2027,947
Cronbach's Alpha	,773	,744

2.3 Analyzing Data

The data obtained after performing the aforementioned scale to the control and experimental groups were evaluated in SPSS 23.00 program (Statistics Packages for Socials Sciences), and the evaluations were made according to independent and dependent groups t-test of obtained findings. Moreover, Pearson Correlation coefficient was determined in order to determine the relationship between pre-application and post-application.

3. Results

3.1 Results Related to the First Sub-Problem

The results of independent samples t-test related to the first hypothesis as 'In pre-application, was there a significant difference between control and experimental groups in perception of instructor behaviors?" were presented in Table 2.

Table 2. Independent samples t-test outcomes of the pre-application

	Group	N	$\bar{x}$	SD	t	p
Insufficient Instructor	Control	88	12,28	4,26	1,848	,06
	Experimental	93	11,20	3,57		
Nervous Instructor	Control	88	16,27	3,93	1,128	,26
	Experimental	93	15,73	3,67		
Understanding Instructor	Control	88	21,85	4,27	-,557	,57
	Experimental	93	21,19	3,97		
Authoritative Instructor	Control	88	8,00	3,05	,933	,35
	Experimental	93	7,60	2,67		

Df = 179.

As could be seen in the table, differences were noticed between the averages of control group and experimental group participants in four sub-dimensions of the scale. These differences were concluded to be statistically insignificant ($p>0.05$). According to this result, the control group and experimental group were determined to be equal in terms of perceived instructor behaviors in pre-application. In other words, it was concluded that the control group and experimental group participants before the experiment perceived instructors as the same.

3.2 Results Related to the Second Sub-Problem

The results of the independent samples t-test performed for answering the second sub-problem of the research as "In post-application, was there a significant difference between control and experimental groups in perception of instructor behaviors?" were presented in Table 3.

When Table 3 was analyzed, differences were observed between the control group and experimental group score averages in post-application. Independent samples t-test was performed in order to determine whether these differences were significant or not. According to the obtained results, significant differences were observed in two sub-dimensions of the scale ($t_{insufficient\ instructor}$=2,299; $p<0.05$; $t_{nervous\ instructor}$=2,108; $p<0.05$). In terms of this result, experimental group participants were noticed to consider the instructor less insufficient than the control

group participants were. When the averages in pre-application and post-application were regarded, scores of the participants in the experimental group for perceiving the instructor as insufficient were observed to decrease ($x_{pre\text{-}control\ insuff.\ inst.}$= 12,28; $x_{post\text{-}control\ insuff.\ inst.}$= 12,20; $x_{pre\text{-}exper.\ insuff.\ inst.}$= 11,20; $x_{post\text{-}experi.\ insuff.\ inst.}$= 10,76).

Table 3. Independent samples t-test outcomes of the post-application (Df= 179)

	Group	N	$\bar{x}$	SD	t	p
Insufficient Instructor	Control	88	12,20	5,19	2,299	,02
	Experimental	93	10,76	2,99		
Nervous Instructor	Control	88	15,96	4,47	2,108	,03
	Experimental	93	14,76	3,10		
Understanding Instructor	Control	88	22,26	4,81	1,611	,10
	Experimental	93	21,11	4,72		
Authoritative Instructor	Control	88	8,48	3,71	-1,097	,27
	Experimental	93	9,05	3,20		

In a sense, it was concluded that visually and technology-assisted activities implemented in the experimental group caused participants to perceive the instructor more sufficient. The result that "an instruction supported with visual elements and technology causes the instructor to be perceived more sufficient" was a significant one. In "nervous instructor" sub-dimension of the scale, it was determined that the participants in the experimental group perceived the instructor as significantly less nervous as the participants in the control group did. In other words, visual elements and technology assisted teaching activities provided instructors to be perceived as less nervous.

3.3 Results Related to the Third Sub-Problem

The results of the paired samples t-test performed for answering the third sub-problem of the research as "Was there a significant difference in perception of instructor behaviors between pre- and post-applications in control groups?" were presented in Table 4.

Table 4. Paired samples t-test outcomes of the control group between pre-application and post-application

		Mean	N	SD	t	p_t	r	p_r
Insufficient Instructor	Pre-application	12,28	88	4,26	,175	,861	,611	,000
	Post-application	12,20	88	5,19				
Nervous Instructor	Pre-application	16,27	88	3,93	,738	,463	,576	,000
	Post-application	15,96	88	4,47				
Understanding Instructor	Pre-application	21,85	88	4,27	-,941	,349	,604	,000
	Post-application	22,26	88	4,81				
Authoritative Instructor	Pre-application	8,00	88	3,05	-1,456	,149	,583	,000
	Post-application	8,48	88	3,71				

Df = 87.

It was noticed that there were no differences between the pre-application and post-application in terms of control group participants' perceptions of the instructor behaviors (p_t>0.05). Significantly high (p_r<0.05) Pearson Product-Moment correlation between pre-application and post-application score averages in the control group (r>0.57) indicated the determination, namely no change, in perception of the participants.

3.4 Results Related to the Fourth Sub-Problem

The results of the paired samples t-test performed for answering the fourth sub-problem of the research as "Was there a significant difference in perception of instructor behaviors between pre- and post-applications in experimental groups?" were presented in Table 5.

Table 5. Paired samples t-test outcomes of the experimental group between pre-application and post-application

		Mean	N	SD	t	p_t	r	p_r
Insufficient Instructor	Pre-application	11,20	93	3,57	1,244	,217	,471	,000
	Post-application	10,76	93	2,99				
Nervous Instructor	Pre-application	15,73	93	3,67	2,539	,013	,535	,000
	Post-application	14,76	93	3,10				
Understanding Instructor	Pre-application	21,19	93	3,97	,743	,460	,635	,000
	Post-application	21,11	93	4,72				
Authoritative Instructor	Pre-application	7,60	93	2,67	-5,123	,000	,581	,000
	Post-application	9,05	93	3,20				

When Table 5 was analyzed, it was noticed that experimental group participants' way of perceiving the instructor behavior was noticed to differ in pre-application and post-application. In "nervous instructor" sub-dimension, a significant difference was determined between pre-application and post-application ($X_{pre\ nervous\ instr}$ =15.73; $X_{post\ nervous\ instr}$ =14.76; p_t<0.05). According to this result, visual element and technology-assisted teaching led participants perceive the instructors less nervous. A medium level positive significant relationship was also observed between the pre-application and post-application. In "authoritative instructor" sub-dimension, significant difference was obtained between the pre-application and post-application ($X_{pre\ authoritative\ instr}$ =7.60; $X_{post\ authoritative\ instr}$ =9.05; p_t<0.05). Visual element and technology-assisted teaching caused students to perceive the instructor as more authoritative because authoritative score averages of the students in the post-application was found to be significantly higher.

4. Discussion and Conclusion

This research was carried out for determining how visual element and technology-assisted teaching courses affected students' perceiving the instructor behaviors. According to this purpose, whereas the courses in the control groups were lectured in a traditional way without using visual elements and technology, the courses in the experimental groups were lectured benefiting frequently from visual elements and technology. For determining how the students perceived the instructor, Perceived Instructor Behaviors scale was used for measurements in the pre-application and post-application.

When the results of the research were considered, the participants in the experimental groups rather than the ones in the control group perceived the instructor less insufficient in post-application. Visual elements and technology-assisted teaching caused participants to perceive the instructors as sufficient. Visual and technology-content courses provided positive contribution upon the pedagogical efficiency of the instructors. The positive feeling of the students who perceived the instructor as sufficient was one of the most significant source of motivation for them. These positive feelings support students to respond positively to the instructions, directions, requests and offers of the instructor positively and to participate into in-class activities. So that there will be no psychological obstacle for the students to accomplish fulfilling the requirements of the course. The findings of the studies emphasizing that both computer-assisted teaching implementations and use of audio and visual equipment positively affected the students' attitudes towards lectures and hence academic success (Akdağ & Tok, 2010; Bayturan, 2011; Güven, & Sülün, 2012; Önal & Demir, 2013; Teyfur, 2010; Şan, 2008) supported the findings of this research. From another viewpoint, these positive feelings are expected the instructor to have success.

In another result of the research, the participants in the experimental group perceived the instructor as significantly less nervous than the ones in the control group in post-application in "nervous instructor" sub-dimension. This indicated visual elements and technology-assisted teaching provided students to perceive the instructor less nervous. The research, in general sense, indicated that visual elements and technology-assisted teaching caused participants to perceive the instructor as more sufficient and calmer. This finding was also supported with the findings of the studies carried out by Bayturan (2011), Güven and Sülün (2012), Önal and Demir (2013), and Teyfur (2010). Behaviors of the students who do not perceive the instructor nervous in the classroom becomes positive.

Teacher image is rather distorted in Turkish press (Polat & Ünişen, 2016). Any amount of nervousness perceived in the instructor may cause the students feel lack of affectional security. For that reason, should visual elements and technology-assisted teaching causing instructors to be perceived as calm by the students be popularized, or should the teaching process be cleared of visual elements and technology when considered in the last

sub-problem of the research as "visual element and technology-assisted teaching caused students to perceive the instructor as authoritative." In the research, visual element and technology-assisted teaching caused students to perceive the instructor as calm and authoritative at the same time. When the results of some studies in the literature were considered (Adams, 2006; Clark, 2008; Ely, 1970; Ely, 1996; Harlin & Brown, 2007; Reeves, Herrington & Oliver, 2005; Tufte, 2003), the present study caused emergence some questions such as which elements of traditional human to human methods should we strictly stick to, or is it necessary to minimize the use of visual elements and technology in order to minimize perception of the instructor as authoritative? In other words, should we prefer a calm instructor using visual materials and technology-assisted methods or a democratic one using traditional methods? In their study, Coşgun-Ögeyik (2016) reported that students developed more positive attitudes in traditional teaching methods rather than the technology-assisted methods, and this deepened the dilemma revealed in this research. De Silva (2014) also expressed that students reacted to technology. Kalyuga (2011) stated that elements of affective domain played the key role in investing the cognitive domain resources into learning process. For those reason, what should be our priority? An authoritative instructor or a calm instructor…

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