BELIEFS OF ACADEMICIANS AT THE FACULTY OF EDUCATION ABOUT THE FACTORS AFFECTING THE USE OF TECHNOLOGY IN TEACHING AND LEARNING ENVIRONMENTS

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ABSTRACT

The main purpose of this study is to investigate the beliefs of academicians within the Faculty of Education at Abant Izzet Baysal University about the factors affecting the implementation of technology in teaching and learning environments. Belief about teaching with technology () Instrument, which consists of enabling factor and likelihood in school sections, was used to collect the data. Descriptive statistics, t-test and nonparametric tests were applied to analyze the data. The descriptive results regarding enabling factor section and likelihood in school section of the BATT instrument were analyzed and compared. Besides, the beliefs of academicians' about teaching with technology were examined depending on their demographical characteristics. The findings indicated that the mean scores of academicians differ significantly depending on their branch or departments.

Keywords: Belief about teaching with technology, gender, age, department.

EĞİTİM FAKÜLTESİNDEKİ AKADEMİSYENLERİN ÖĞRETME VE ÖĞRENME ORTAMLARINDA TEKNOLOJİ KULLANIMINI ETKİLEYEN FAKTÖRLERLE İLGİLİ İNANÇLARI

ÖZET

Bu araştırmanın temel amacı Abant İzzet Baysal Üniversitesi Eğitim Fakültesi'ndeki akademisyenlerin öğrenme ve öğretme ortamlarında teknoloji kullanımını etkileyen faktörlerle ilgili inançlarını incelemektir. Veri toplamak için "imkân veren faktörler" ve "okuldaki olasılık durumu" bölümlerinden oluşan "Teknoloji ile Öğretime İnanış Ölçeği" kullanılmıştır. Veri analizinde betimsel istatistikler, t-test, ve nonparametrik testlerden yararlanılmıştır. İmkân veren faktörler ve okuldaki olasılık durumuna ilişkin betimsel sonuçlar analiz edilmiş ve karşılaştırılmıştır. Akademisyenlerin imkân veren faktörler hakkındaki inançlarına ilişkin puanlar okuldaki olasılık durumu puanlarından anlamlı ölçüde yüksek bulunmuştur. Ayrıca, akademisyenlerin teknoloji ile öğretme hakkındaki inançları demografik özelliklere göre de incelenmiştir. Bulgular akademisyenlerin okuldaki olasılık durumuna ilişkin puanlarının bölüm ya da alanlarına göre anlamlı biçimde faklılaştığını göstermiştir.

Anahtar Kelimeler: Teknolojiyle öğretim hakkında inanç, cinsiyet, yaş, bölüm.

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1. INTRODUCTION

The technological revolution has influenced all areas of education in many societies and higher education is not an exception. A successful integration of technology may positively influence the teaching facilities of academicians in higher education. For instance, they may take the advantage of Internet, online materials, mobile technologies, computer animations and graphics. According to McKenna et al. (2000), integrating technology into instruction and educational environments increases the opportunity for individualized learning and offers a new way of thinking and communicating for both learners and educators.

According to Cuban, Kirkpatrick and Peck (2001), despite the advantages of technology in school environments, teachers' use of technology is not innovative and they sustain their existing practices. In addition, Fullan (1991) has categorized the factors that affect the implementation of educational innovations into four groups; characteristics of innovation itself, school variables, implementation-furthering strategies, and other external factors (policy, and administrative support, budget). Also, school size is considered as a factor that can potentially affect teachers' use of educational technology in classrooms (Wu, Hsu & Hwang, 2006).

Moreover, literature (Abdelraheem, 2004; Pajares, 1992; Richardson, 1996) indicates that an important and critical factor that influence the integration of instructional technology is teachers' beliefs, since "beliefs are far more influential than knowledge in determining how individuals organize and define tasks and problems and are stronger predictors of behavior" (Pajares, 1992, p. 311). In addition, Lumpe and Chambers' (2001) study indicated that teachers' context and self-efficacy beliefs were significant predictors of teachers' use of technology.

Teachers' general beliefs and needs related to use of use technology were investigated in the 1999–2000 Texas study. The results indicated specific item level needs: "(1) a lesser need for training in how to use the computer and, (2) a greater need to be trained in teaching techniques and strategies to integrate technology into the curriculum" (Knezek & Christensen, 2002, p. 373).

Furthermore, related research implies that the way in which teaching is conducted in higher education is dependent on the educational beliefs and presumptions of academic staff (Samuelowicz & Bain, 2001). Ferguson (2004) investigated the relationships among pedagogical beliefs and teaching styles, and the relationship between faculty beliefs about teaching with technology and teaching strategies. The findings of the study indicated that the preferred teaching strategies and styles of teachers determined or shaped patterns of their technology usage. Therefore, in addition to their ability to use technology, teachers (Windschitl & Sahl, 2001) and faculty beliefs are in deep relation with their technology integration in their teaching activities (Abdulraheem, 2004).

The main purpose of this study is to investigate the beliefs of academicians about the factors affecting the use of technology in teaching and learning environments of the faculty of education. This study also investigates to which extent the academicians are provided technological opportunities that affect their use of technology in the faculty of education.

2. METHODOLOGY

2.1. Participants

The participants of the study were academicians in Faculty of Education at Abant Izzet Baysal University in Turkey. A total of 58 out of 160 (24 females and 34 males) academicians voluntarily participated in this study in Fall semester, 2007.

2.2. Instrument

The researcher used a questionnaire which consists of a personal information section and Beliefs about Teaching with Technology () Instrument which was developed by Lumpe and Chambers (2001). The BATT instrument (see Table 1) has also two sub-sections named *enabling factors* and *likelihood in school*. In each section, the instrument contains the same 13 items on a five-point Likert Type scale (1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree). In the enabling factors section, academicians indicated the degree to which they believe each factor (n=13) enables them to effectively use technology in their classroom. In the likelihood section, academicians indicated the likelihood that the same 13 factors are available to them in their school environment. The instrument was distributed to the participants in its original form since they were proficient in English.

3. RESULTS

3.1. Technological Experiences of Academicians

The descriptive statistics indicated that all academicians (n=58) participated in the study have personal computers. Besides, 56 academicians out of 58 declared that they have enough skills to use technological devices (e.g., computer, projector) in the classrooms. Moreover, all academicians expressed that they want to use technological devices in their classroom.

3.2. Descriptive Statistics

Table 1 displays the descriptive statistics for enabling factors section which indicates beliefs of academicians about teaching with technology and for likelihood in school section which indicates the likelihood that the factors are available to the academicians in their school environment.

Table 1. Descriptive statistics for enabling factors and likelihood in school sections of the BATT instrument (N=58).

Factors	Enabling Factors Section			Likelihood in School Section		
	Range	Mean	SD	Range	Mean	SD
1. Resources (funding, equipment, etc.)	3.00	4.75	.54	4.00	2.50	1.12
2. Professional development opportunities on using technology.	3.00	4.53	.62	4.00	2.32	.998
3. Access to the Internet.	1.00	4.72	.45	4.00	3.86	1.16
4. Quality software.	3.00	4.69	.56	4.00	2.68	1.07
5. Physical classroom structures (electrical outlets, movable tables, circuit breakers, space, etc.).	3.00	4.70	.62	4.00	2.41	1.17
6. Support from school administrators.	3.00	4.55	.70	4.00	2.46	1.07
7. Support from other teachers.	3.00	4.17	.81	4.00	2.82	1.12
8. Technical support.	3.00	4.44	.72	4.00	3.03	1.10
9. Time to plan for technology implementation.	3.00	4.41	.64	4.00	2.65	1.06
10. Time to let students use technology.	2.00	4.50	.59	4.00	2.56	1.01
11. Smaller class sizes.	4.00	4.20	.98	4.00	2.13	.887
12. Mobile equipment (laptops, etc.).	3.00	4.34	.80	4.00	1.89	.930
13. Proper connections (computer to projector, etc.).	2.00	4.65	.54	4.00	2.68	1.18

Mean scores of each factor in enabling factors section are above 4.00 and they ranged from 4.17 to 4.75 out of a possible mean score range of 1.00 to 5.00. On the other hand, most mean scores of factors, except 3 and 8, in the likelihood in school section are under 3.00. Besides, in likelihood in school section, the mean scores ranged from 1.89 and 3.86. The highest mean score belongs to the factor 3 "access to the Internet", and the lowest mean score belongs to the factor 12 "mobile equipment" (see Table 1). These descriptive results reveal that the mean scores for each factor in enabling factors section are higher than the mean scores in the likelihood school section. According to these results, the academicians agree and believe that each factor will enable them to effectively use technology in their school environment. However, the descriptive results in likelihood in school section reveal that most technological factors are not available to them in their school environment.

As displayed in Table 2, the scores of enabling factors section ranged from 43 to 65 with a 31.12 variance while the scores of likelihood in school section ranged from 13 to 61 with a 87.85 variance out of a possible range of 13-65.

Table 2: Descriptive statistics for total scores of enabling factors and likelihood in school sections (N=58).

Sections	Min.	Max.	Range	Possible Range	Variance
Enabling factors	43	65	22	13-65	31.12
Likelihood in school	13	61	48	13-65	87.85

3.3. Differences between Enabling Factors and Likelihood in School Sections

Results displayed in Table 3 show that the mean score (58.60) of academicians' belief about teaching with technology in enabling section is higher than their mean score (34.06) in likelihood in school section. Besides, the mean score in enabling factor section (58.60) is quite close to upper level of possible mean score range (13.00-65.00) while the mean score (34.06) in the likelihood in school section is about half of the upper level of possible mean score range. The t-test between enabling factors section and likelihood in school indicated a significant difference (t = 15.463, df = 57, P = .000). According to these results, academicians highly believe that the factors in enabling section will enable them to effectively use technology in their school environment. However, they indicated a notable low level of likelihood that the same factors are available to them in their school.

Table 3: Paired samples t-test results for enabling factors and likelihood in school sections (N=58).

Sections	Mean	SD	t	df	P
Enabling section	58.70	5.57	15.463*	57	.000
Likelihood in school	34.06	9.37			

* P<.05

3.4. Differences based on Departments

As displayed in Table 4, Kruskal Wallis test results on differences in enabling factor section based on departments indicated that the differences in mean rank scores of the academicians are not significant ($c^2 = 5.88$, df = 6, P = .436). However, the test results on differences in likelihood in school section based on departments indicated that the differences in mean rank scores of the academicians are significant ($c^2 = 16.68$, df = 6, P = .010).

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Table 4: Kruskal Wallis test results for enabling factors and likelihood in school sections based on departments.

| Department | N | Enabling Factors Section | | | | Likelihood in School Section | | | | |
		Mean Rank	df	χ^2	P	Mean Rank	df	χ^2	P	Significant difference
(A) Turkish Teaching	4	23.63	6	5.88	.436	28.75	6	16.68	.010*	
(B) Educational Sciences	13	30.96				14.85				B-C , B-E, B-F
(C) Elementary Education	18	22.92				30.69				
(D) Special Education	6	36.42				28.67				
(E) Fine Arts Education	8	34.81				39.56				
(F) Foreign Language Teaching	6	35.08				42.92				F-C
(G) Computer Education and Technology	3	31.33				34.83				

* $P < .05$ In addition, Mann Whitney U-test results revealed that academicians in the department of Educational Sciences have significantly lower mean rank scores in likelihood in school section than the academicians in Elementary Education, Fine Arts Education and Foreign Language Teaching departments. Besides, according to the test results, academicians in the department of Foreign Language Teaching have significantly higher mean rank scores in likelihood in school section than the academicians in Elementary Education department. The lowest mean rank score (14.85) in the likelihood in school section belongs to the department of Educational Sciences while the highest mean rank score (42.92) belongs to the department of Foreign Language Teaching.

3.5. Differences based on Age

With reference to the Kruskal Wallis test results on differences in enabling factor section based on age in Table 5, the differences in mean rank scores of the academicians are not significant ($c^2 = 6.01$, df = 6, P = .422). Similarly, Kruskal Wallis test results on differences in likelihood in school section based on age indicated that the differences in mean rank scores of the academicians are not significant as well ($c^2 = 5.77$, df = 6, P = .449). According to these results, age does not play a notable a role in the mean rank score differences in both enabling factor and likelihood in school sections.

| Age | N | Enabling Factors Section | | | | Likelihood in School Section | | | |
		Mean Rank	df	χ^2	P	Mean Rank	df	χ^2	P
(A) 25-29	6	19.75	6	6.01	.422	20.50	6	5.77	.449
(B) 30-35	12	23.38				32.13			
(C) 36-39	17	30.09				29.91			
(D) 40-45	10	34.30				26.65			
(E) 46-49	5	36.40				42.30			
(F) 50-55	5	34.20				30.00			
(G) 56-over	3	34.83				22.00			

* $P < .05$

3.6. Differences based on Gender

Results in Table 6 indicate that male and female academicians have almost identical mean scores in enabling factors section of the BATT instrument and t-test results based on gender did not indicate a significant difference at .05 level (t = -.191, df = 56, P = .849). However, female academicians had higher mean score (36.75) than male academicians (32.17) in the likelihood in school section, and the P value (0.067) was close to significance level (0.05). Although the difference was not significant at 0.05 level there was a notable difference between the mean scores of male and female academicians. Therefore, it can be stated that male academicians are less satisfied with the technological availability in the school than the females.

Table 6: T-test results for enabling factors and likelihood in school section based on gender.

Gender	N	Enabling Factors Section					Likelihood in School Section				
		Mean	SD	t	df	P	Mean	SD	t	df	P
Male	34	58.58	5.71	-.191	56	.849	32.17	8.82	-1.87	56	.067
Female	24	58.87	5.50				36.75				

4. DISCUSSION

This study investigated the beliefs of academicians about the factors affecting the use of technology at the Faculty of Education at Abant Izzet Baysal University. The descriptive statistics indicated that mean scores for beliefs of academicians about teaching with technology in enabling factor section were higher than their mean scores in likelihood in school section, similar to the findings of Abdelraheem's study (2004). Mean scores of each factor in enabling factors section are above 4.00 which is classified as "agree", while most mean scores of the factors, except 2 factors, in the likelihood in school section are under 3.00 out of a possible mean score range of 1.00 to 5.00. Paired samples t-test results showed that there was a significant difference between the academicians' beliefs about enabling factors and likelihood in school factors in favor of enabling factors. According to these results, the academicians agree or believe that each factor in enabling factor section will enable them to effectively use technology in their classroom. However, similar to the findings of prior studies (Abdelraheem, 2004; Lumpe, Haney & Czerniak, 2000) the descriptive statistics in likelihood in school environment reflected that most of the technological factors are not sufficiently available to the academicians in the faculty of education.

The beliefs of academicians about teaching with technology were examined depending on their gender, age and departments. The Kruskal Wallis test results based on age indicated that the differences in mean rank scores of the academicians are not significant in both enabling factor and likelihood in school section. These results suggest that age does not have a significant impact on belief of academicians about teaching with technology in the enabling factor section, and also it does not have a significant impact on the likelihood scores of academicians that indicates the technological factors are available to them in their school.

The Kruskal Wallis test results indicated that mean rank scores of the academicians do not differ significantly based on department in the enabling factor section. However, the same test results revealed that academicians' mean rank scores differ significantly in the likelihood in school section based on department similar to the findings of Abdelraheem's study (2004) which suggests that the nature of their subjects forces them to use technology in teaching. Mann Whitney U-test results revealed that academicians in the department of Educational Sciences have significantly lower mean rank scores in likelihood in school section than the

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academicians in Elementary Education, Fine Arts Education and Foreign Language Teaching departments. While the highest mean rank score (42.92) in the likelihood in school section belongs to the department of Foreign Language Teaching, the lowest mean rank score (14.85) belongs to the department of Educational Sciences. Thus, we can state that the most satisfied department with the technological availability in school is the department of Foreign Language Teaching and the least satisfied department with the technological availability in school is the department of Educational Sciences.

The mean scores of female and male academicians in enabling factor and likelihood in school sections did not differ significantly. However, the mean score of females (36.75) in the likelihood in school section were notably higher than the mean score of the males (32.17). Besides, the P value (.067) for differences in mean scores of the females and males were close to significance level (.05). These findings suggest that female academicians are more satisfied with the technological availability in the school than the male academicians, although the difference is not significant.

5. CONCLUSION

The main purpose of this study is to investigate the beliefs of academicians about the factors affecting the use of technology in teaching and learning environments. According to the descriptive results, the academicians highly believe that the factors in enabling factor section will enable them effectively use technology. This study also investigated to which extent the academicians are supported by technological factors that affect their use of technology in their school environment. The descriptive results in likelihood in school environment revealed that the technological factors are not sufficiently available to the academicians in faculty of education. However, all participants in this study expressed that they are eager to use technological devices in school environments. Besides, most academicians declared that they have enough skills to use technological devices (e.g., computer, projector). According to Venezky (2004), technological infrastructure and teacher competencies were critical for successful implementation of technology in school environments. Therefore, the findings of this study suggest that if the technological infrastructure or factors in Table 1 are sufficiently available to the academicians it seems likely that they will take more advantages of various technologies (e.g., Internet, mobile equipment, computers with projectors etc.) effectively in their teaching processes and academic works in faculty of education. The BATT instrument in this study, however, was only distributed to the academicians at the Faculty of Education. Therefore, the future researchers are encouraged to further investigate the beliefs of academicians at different faculties and compare the results to observe whether the beliefs of academicians about teaching with technology differ significantly depending on their institutions.

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