

EFFECTS OF A TECHNOLOGY-FRIENDLY EDUCATION PROGRAM ON PRE-SERVICE TEACHERS' PERCEPTIONS AND LEARNING STYLES

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ABSTRACT

A technology-friendly teacher education program can make pre-service teachers more comfortable with using technology from laggard to innovator and change their learning styles in which they prefer the use of technology in teaching. It is investigated how a technology-friendly mathematics education program, which provided 49 pre-service teachers an opportunity to conduct technology-based class activities and to develop teaching materials using technology, affects their perceptions about technology and learning styles. Results showed that participants were more highly receptive to be an innovator or early adopter which means they are more eager for using technology as a teaching tool. This implies that teachers' perceptions and learning styles can be potential, sustainable, and possible variables to be changed for meaningful teaching with technology.

KEYWORDS

Technology-friendly education program, perception, learning style

1. INTRODUCTION

Technology as a tool can support instruction to help students see concrete characteristics through visualizing abstract mathematical concepts and explore conceptual properties through directly manipulating those concepts by themselves. In addition, visualization through technology can improve students' motivation, engagement, and thus development of mathematical thinking when they appropriately use it. These advantages in the use of technology for learning mathematics have been emphasized in developing a curriculum (NCTM, 2000). Although many advantages of using technology in curricula have been advocated by researchers, teachers still have negative perspectives on using technology in their classes because of a lack of knowledge and experience. In order to help teachers overcome their negative perspectives on technology and encourage them to use it in their classrooms, a technology-based education program, which can raise the possibility of not only changing their perceptions about technology, but also preferring their learning styles to employ technology in teaching, is a viable, interesting, and sustainable option to be conducted during the period in pre-service teacher education. A technology-friendly teacher education program can make pre-service teachers more comfortable with using technology from laggard to innovator and change their learning styles in which they prefer the use of technology in teaching (Kim, 2015). As a result, these two changes can increase the sustainable probability of technology use into their future classes.

For this purpose, 49 pre-service teachers in a university in Seoul, Korea participated in the study. It is investigated how a technology-friendly mathematics education program, which provided them an opportunity to conduct technology-based class activities and to develop teaching materials using technology, affects their perceptions about technology and learning styles. Results showed that participants were more highly receptive to be an innovator or early adopter which means they are more eager for using technology as a teaching tool because they changed their Technological Pedagogical Content Knowledge (TPCK) in planning a technology-based class to motivate students and help them to understanding mathematical concepts according to the post-survey results (Kim et al., 2013). Thus it can be inferred that the pre-service teachers would be more likely to use technology in their future classrooms. Second, the participants who experienced the program changed their learning styles whose elements consist of visual mode because there was a statistically significant difference in student reflections for the usefulness of technology-based learning between the pre-survey and post-survey.

Table 1. Results for changes in learning styles (Note: *p < .05)

	Contents	Pre-survey	Post-survey	df.	t	Sig. (2-tailed)
		M (SD)	M (SD)			
Visual type	Oral guidance notes are much easier to follow than written guidance notes.	0.49 (0.87)	0.43 (0.91)	48	0.417	0.679
	For review, I prefer to write down or make a note.	0.73 (1.19)	0.86 (1.10)	48	-0.747	0.459
	I love to develop and make either a graph or a chart and do it well.	-0.04 (0.94)	0.35 (0.86)	48	-2.571	0.013*
	I can easily understand and follow directions in a map.	0.84 (0.72)	1.08 (0.64)	47	-2.372	0.022*
	I can understand news better by reading rather than listening to it from radio.	0.43 (1.0)	0.33 (1.11)	48	0.598	0.553
	The best way to memorize something is to visualize its picture in my mind.	0.82 (0.83)	1.02 (0.85)	48	-1.808	0.077
	I love to touch something by my hand during learning.	0.43 (0.91)	0.86 (0.89)	48	-3.000	0.004*
	I get information in the field of interesting subjects by reading related resources.	0.82 (0.73)	0.90 (0.82)	48	-0.703	0.485
Auditory type	I can memorize a topic better by listening rather than reading.	-0.16 (0.72)	-0.04 (0.84)	48	-0.903	0.371
	I need explanations about graphs, diagrams, and visual directions.	0.59 (0.79)	0.49 (0.89)	48	0.843	0.404
	When hearing two voices, I can tell the difference between them.	0.69 (0.74)	0.86 (0.71)	48	-1.938	0.059
	I can do better in a course work by having a lecture or listening to a tape.	0.47 (0.98)	0.69 (0.71)	48	-1.710	0.094
	I can memorize a word better by repeatedly speaking rather than writing it in a paper.	0.20 (0.93)	0.37 (0.95)	48	-1.273	0.209
	I love more to listen to a lecture or a speech than to read it.	0.41 (0.96)	0.53 (0.89)	48	-0.948	0.348
	I prefer to listen to news from radio rather than reading the news in a newspaper.	-0.10 (0.80)	-0.02 (0.97)	48	-0.531	0.598
	Verbal directions are much easier to follow than written directions.	-0.04 (0.84)	-0.02 (0.83)	48	-0.136	0.892

After pre-service teachers experienced the program, they preferred to develop and make visual teaching materials such as graphs and charts and to use touching and visualizing activities in learning. They perceived that the use of technology environments and activities is very effective for them to increase their visualizing filters and seems to cultivate their confidence in technology use. In this process, activities for visualizing abstract concepts and properties help them engage more frequently in visualizing processes and thus assist to change in the degree of their visual learning styles.

Based on a technology-friendly education program to be implemented, this study has provided insight into the views of teachers' perceptions and learning styles as key issues for them to create potential and sustainable opportunities for meaningful teaching with technology. One implication for teaching practice is that providing a technology-friendly learning environment to pre-service teachers may help them become more comfortable with using technology in their classes over the length of time. As they become more comfortable with using technology in their classes and change their receptivity to and their beliefs about the use of new technology, in the long run, they would be more likely to employ the sustainable use of technology for pedagogical purposes in their future classes.

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