

## Digital Media: Effects on Students' Attitude towards Science among University Science Students

Muhammad Shabbir Ali\*, Sabahat Parveen†, and Hina Jalal‡

### Abstract

*The role of digital media and technology in the field of science education is supporting 21<sup>st</sup> century educational institutions and system reforms in the whole globe. Digital media is most significant factor influencing the improvement of students' achievement as well as their attitude towards science. It is the need of time to investigate the positive and negative effect of digital media and technology on attitude of university students towards science. Therefore, the main purpose of the present study was to investigate the effects of digital media on attitude of university students towards science in the province of Punjab, Pakistan. A sample of 440 science students from six (06) public and private universities located in Punjab was selected by using random sampling technique. One questionnaire: regarding digital media was developed by the researcher himself but another questionnaire: Test of Science-Related Attitude (TOSRA) was adapted to collect data. Simple Correlation ( $r$ ), Multiple Correlations ( $R$ ), and Standard Regression Coefficient ( $\beta$ ) were used to describe the predictive relationships.  $t$ -test and ANOVA with Eta squared were also used to find out the differences among the variables. Findings of this research study revealed that there was positive relationship between digital media and students' attitude towards science. It was discovered that in public and private universities, there was significant difference observed regarding digital media in favor of private universities. The research study recommended that all government sector universities should motivate their teachers as well as students regarding proper use of digital media for their academic purpose.*

**Keywords:** Digital Media, Technology, Students' Attitude towards Science, Science Education, Students' Achievement in Science.

### Introduction

In present, most of the students are familiar with technological communication. More or less, we use technology in many ways. In 21<sup>st</sup> century, educational institutions are focusing more to introduce digital media. Institutions are keeping pace with the rapid changes in technologies (Chien, 2016).

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\* Dr. Muhammad Shabbir Ali, Assistant Professor (Education) University of Education, Campus Faisalabad. Email: [drshabbirue@yahoo.com](mailto:drshabbirue@yahoo.com)

† Sabahat Parveen, Assistant Professor University of Education, Campus Faisalabad. [sabahatmushtaq@hotmail.com](mailto:sabahatmushtaq@hotmail.com)

‡ Hina Jalal, Ph. D. Scholar (Education) GC University, Faisalabad

Although, some people consider digital media as cyber culture and uncommon event (Pavlik, 2008), yet we consciously and subconsciously consider technology as part of our life. Digital media can be defined as “system of public communication” and “the system of content” which distribute through networked based technology (Pavlik, 2008). On the Contrary, some people identify digital media as only technological concept (Chien, 2016).

Fuchs (2008) suggested the term information and communication technologies (ICTs) in replacement of digital media. He also recognizes the digital media is a general phenomenon to interact through knowledge based technology. Jaeger and Burnett (2010) consider ICTs as the real driver of “physical and virtual interaction”. Today, the digital era influences by the technology. The emerging trends in digital media prompt us create ideas with new perspectives. This pedagogical and technological interface developed a new spawn of experiences (Tillander, 2008).

In education, students need to grasp the concept that education is not only a transformation of knowledge but also enables them to present their critical and creative thinking effectively. So those, students can recognize the importance of digital media. As well as, they acquire the usage of latest technology. The spread of technological development also enhances the capabilities of students to solve problem through wide variety of digital sources of communication (Chien, 2016).

Teachers also use digital tools during their teaching as it makes teaching more beneficial and effective. While, some teachers thought that greater appreciation of digital tools blur the difference between the formal and informal information. Students find difficulties to distinguish between them. Moreover, students are losing the originality in their ideas due to excessive use of digital media. In spite of all, digital technology enables students to share and explore their understandings with knowledge, express their creativity, work collaboratively, up to date their information, and communicate effectively. The digital media provides the opportunities to get the quick and diverse feedback regarding teaching and learning process (Kristen Purcell, Judy Buchanan, Linda Friedrich, 2013). Subsequently, students’ attitude towards digital media enables learning more convenient. Although there is consensus that what is proper meaning to place on attitude. Yet, Students’ attitude defined as “the feelings, beliefs and values held about an object that may be the enterprise of science, school science, the impact of science on society or scientists themselves” (Osborne, Simon, and Collins, 2003).

Through digital media learning can be possible in any situation. Students not only absorb others’ demonstration but also expand their

learning. They actively contribute to the society at large and understand emerging knowledge (Plowman et al., 2010). In present students spend their most of time with digital technology. They are more curious to explore digital world than previous. They engage with digital devices to incorporate with their understandings of world (Plowman et al., 2010).

Rosen (2010) explored that students incorporate with digital media in many aspects to find out new ways of learning. He further asserted that the form of learning with technology is more considered than the learning about digital technology. This enhances the landscape of students to take social and digital technology in learning.

In higher education, students feel more comfortable to learn with digital media. This new innovation may enhance their creativity, connectivity, thinking, social communication, social transformation, and collaboration in education (Cullinane & Hess, 2010). This type of participatory learning transformed “how we learn and what we learn in many ways” and it influence institutional learning (Davidson, Goldberg, & Jones, 2010).

Collins and Halverson (2009) pointed that education should stimulate the students through radical changes. The conceptualization of teaching and learning should merge with digital media for better realization. Even those who avoid to embrace digital media must realize the opportunities of digital media for education guidance. However, digital media does not define and assure the future prediction of education but it provides wide range of learning engagements.

Consequently, the attitude of students towards science is one of important feature of work for researchers (Osborne et al., 2003). The use of digital media in university has the potential to meet the expectations of higher education. Higher education demands the more and easy access of educational information and students’ quick response towards digital changes. Now, the use of digital in universities is becoming important for learning and discussion. As well as, ICTs policy also documented the need to embrace continues and lifelong learning. The modern approaches of digital media in teaching and learning assist the students to achieve their tasks (Stephen, 2012). So that the possibilities of digital media in learning increase the interests of students. It also appeals the preferences of students’ engagement in many aspects of life.

#### **Present Research**

The attitude of students towards science has been working feature by the researchers in last 4 decades. Therefore, present research sought out the investigation of digital media and its effects on students’ attitude towards science among university science students.

### **Objectives of Research**

The main objectives of the present study were

- to investigate the effects of digital media on attitude of university students towards science among university science students
- to identify the relationship between digital media and students' attitude towards science
- to examine the difference between public and private universities regarding digital media and its effects on attitude of university students towards science among university science students

### **Research Questions**

The following research questions were answered in this study

1. To what extent digital media effect the attitude of university students towards science among university science students?
2. what is relationship between digital media and students' attitude towards science?
3. What is the difference between public and private universities regarding digital media and its effects on attitude of students towards science?

### **Methodology**

Present study was descriptive in nature. A survey design was selected to investigate the effects of digital media on students' attitude towards science among university science students.

### **Sample**

The sample of present study consist of 440 science students from six (06) public and private universities located in Punjab was selected by using random sampling technique.

### **Instrument**

In order to gather the data questionnaires was selected as research instrument. Two questionnaires were selected by the researchers. Urdu version of Test of Science-Related Attitude (TOSRA) by Ali, Mohsin, and Iqbal (2013) was adapted to collect data. This scale was consisted of 4 factors as, Social Implications of Science (5 items), Attitude to Scientific Inquiry (5 items), Classroom Enjoyment and Leisure Interest in Science (9 items), and Career Interest in Science respectively (6 items). The reliability of these factors were 0.67, 0.72, 0.88, and 0.87 respectively. Another questionnaire regarding digital media included 15 items developed by the researchers was also used in this study. The validity both the face and content validity of the instrument were also ensured.

**Findings**

**Table 1. Relationship between students' attitude towards science and digital media**

Digital Media	<i>p</i>	<i>r</i>	N
students' attitude towards science	.000	.312	440

Correlation was applied to investigate the relationship between students' attitude towards science and digital media. Table 1 shows the relationship between students' attitude towards science and digital media. The value of  $r = .312$  shows positive and significant ( $p = .000$ ) association between variables. It reflects that students' attitude towards science positively associated with digital media.

**Table 2. Relationship among the variables of students' attitude towards science and digital media**

	Social Implications of Science	Attitude to Scientific Inquiry	A combined Classroom Enjoyment and Leisure Interest in Science	Career Interest in Science
Attitude to Scientific Inquiry	.404			
A combined Classroom Enjoyment and Leisure Interest in Science	.672	.384		
Career Interest in Science	.949	-.006	.503	
Digital Media	.815	.725	.720	.302

$p < .01$

Table 2 indicates the relationship among the variables of students' attitude towards science and digital media. There was significant positive and strong relationship among the Career Interest in Science and Social Implications of Science ( $r = .949$ ), Digital Media and Social Implications of Science ( $r = .815$ ), Digital Media and Attitude to Scientific Inquiry ( $r = .725$ ), and Digital Media and A Combined Classroom Enjoyment and Leisure Interest in Science ( $r = .720$ ). While, there was positive and moderate relationship among Social Implications of Science and Attitude to Scientific Inquiry ( $r = .404$ ), A combined

Classroom Enjoyment and Leisure Interest in Science and Social Implications of Science ( $r = .672$ ), A combined Classroom Enjoyment and Leisure Interest in Science and Attitude to Scientific Inquiry ( $r = .384$ ), A combined Classroom Enjoyment and Leisure Interest in Science and Career Interest in Science, and Career Interest in Science and Digital Media ( $r = .302$ ). On the contrary, there was significant but negative relationship between Attitude to Scientific Inquiry and Career Interest in Science.

**Table 3. Effect of Digital Media on Students' Attitude Towards Science**

	R	R <sup>2</sup>	SE	F (2, 438)	B	SE	$\beta$	t	p
Attitude				40.589	2.647	.113		23.500	.000
Digital Media	.312	.097	.48108		.168	.026	.312	6.371	.000

Regression was carried out to investigate to what extent digital media predict the students' attitude towards science. The results of table 3 shows that the value of  $F = 40.589$  ( $p = .000$ ),  $\beta = .312$  which interpret that digital media can predict the students' attitude towards science positively. The value of  $R^2 = .097$  indicates the 97 % of variance support of digital media to the students' attitude towards science. It also noticed that there was positive and significant relationship between students' attitude towards science and digital media. And, digital media effect the students' attitude towards science significantly.

**Table 4 Difference between public and private university students' attitude towards science regarding digital media**

		M	SD	t	p
Attitude	Public	3.3354	.47996	.694	.01
	Private	3.8746	.56351	.753	.00
Digital Media	Public	3.1463	.98273	.601	.00
	Private	4.2092	.83694	.838	.00

The mean differences between the mean scores of public and private universities were analyzed through independent  $t$ -test. There was significant difference observed among public and private university students. Students' attitude towards science in private university ( $M = 3.8746$ ) was significantly slightly better than the private university ( $M = 3.8746$ ) at the value of  $t = .753$ . Moreover, there was also differences between the students in private and public university. Students in private university ( $M = 4.2092$ ) showed their attitude towards science regarding digital media more than the public university students ( $M = 3.1463$ ). It

was discovered that in public and private universities, there was significant difference observed regarding digital media in favor of private universities.

### **Discussion**

The main objectives of this study were, investigate the effects of digital media on attitude of university students towards science, identify the relationship between digital media and students' attitude towards science, and examine the difference between public and private universities regarding digital media. The findings of present study indicate that there is positive and significant relationship between digital media and students' attitude towards science. This finding is also agreement with the study of Güven (2016) who study the association between university students' attitudes towards Information and Communication Technology and media tools and found positive relationship between them. This study also reported the relationship among the variables of students' attitude towards science. This finding is similar to the study of by Ali, Mohsin, and Iqbal (2013) and Osborne, J., Simon, S., & Collins, S. (2003). who found in their studies the positive and significant relationship among these variables. The major finding of this study was the effect of digital media on students' attitude towards science and the result showed that digital media effect the students' attitude towards science significantly. The findings of present research were similar to the studies of Ali M. Shabbir, Mohsin M. Naeem, & Iqbal M. Zafar (2013), Chien jemmy, (2016), Osborne, J., Simon, S. and Collins, S. (2003), and Güven, Z. Z. (2016). Subsequently, current study also found that private university students engaged more in digital media with their attitude towards science than the public university students.

### **Conclusion**

On the bases of findings, the researchers concluded that the digital media has significant effect on students' attitude towards science. As well as, there is positive and significant relationship between the digital media and students' attitude towards science. It is also concluded that the students in private university have positive attitude towards science regarding digital media than the public university students. With reference to the findings of this study, researcher also concluded that the public sector universities should motivate their teachers as well as students regarding proper use of digital media for their academic purpose. The digital media usage caught the students' attention as the results from private university showed.

### **Recommendation**

Additionally, several points of recommendations were made by the researchers as, present study suggests that continue work is needed to

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explore the various aspects of digital media and its effects on academic areas, especially sequential curriculum for learning in higher education. Public university teachers should also enhance their teaching techniques through digital media to bring out learning curiosity among students. Students feel more comfortable to engage in digital media so that efforts should be made by the government and academics to maintain and enhance the students' attitude towards science through digital media.

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