

Study of the Impacts of Educational Technology on Academic Progress of Students in Bamian Boys' Center High School

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ABSTRACT

The aim of this research was to study the impact of educational technology on the academic progress of Bamian boys' high school students in 1401 (2022). This research was applied in terms of purpose and a descriptive survey in terms of nature. Societal statistics of this research were the whole of 83 teachers at Bamian Boys' High School. So, from the societal statistics, we used simple random sampling with confidence levels of 95% and 5% error for 70 people selected according to Morgan's table, and 64 of them answered the questionnaires. For data collection, a questionnaire measuring the attitude towards the use of technology in education (including 50 questions) was specially prepared for teachers and fixed to check their academic progress. SPSS 24 statistical software was used in data analysis. The research outcome indicates factors like the teacher's understanding and the benefits of implementing educational technology and equipment's effects on the academic progress of school students. The result means that a spiritual relationship exists between educational technology and the academic progress of students.

Keywords: technology, educational technology, academic progress

Introduction

The passage of time and the entry of new technology into human life have changed his lifestyle. In order to be more productive and meet his needs, man must create this technology and synchronize himself with it. He should also adapt to these technologies and determine his direction. The field of learning and education is not unknown with these technologies. Until several years ago, words such as electronic education and learning management systems

seemed new, but today they have found their place and are used practically. “The focus has shifted from the traditional blackboard to film, radio, teaching machines, television, and computers, and many other developments are coming” (Zangheh,2013, p.108).

Education is a great platform for using educational technology, and all levels need to use new educational methods, media, and tools, from preschool to high school. An example that can be mentioned is the use of CDs, multimedia, educational software, pictures, posters, and different teaching methods in the classroom. That’s why games have been used throughout the history of education (Fatullahi; Hassani& Jafari).

Now, what should be done with these big and increasing developments in the field of learning and education? This is where the field of educational technology comes into action to answer such questions. New terms have emerged from the combination of these technologies with educational technology (Fardanish,2019).

Another point is that one of the most necessary changes in educational systems is the change in attitude and teaching-learning strategies used by teachers and executive managers of the educational system (Abolhasani,2015).

A lot of research has been carried out in this field, and every day more is added to communication sciences and other sciences related to learning and teaching. Today, education is referred to as a regular process due to the knowledge, skills, and attitudes of students being strengthened and expanded. In this process, attention is paid to the production and expansion of information and skills. In addition, it is necessary to teach, to know the learners according to individual differences, and, more importantly, to be familiar with efficient teaching and learning methods. (Manocheharizadeh, Elham et al. 2017).

According to Fardanesh (2019), educational technology is not a new thing in the general sense, and its age can be considered the same as the age of education. But educational technology, in its special sense, has been under the attention of education specialists for less than a century. Today, whenever there is a discussion of educational technology, it means a set of methods and instructions that use scientific findings to solve educational problems, including design, implementation, and evaluation. The definition agreed upon by the American experts in educational technology and communication is: educational technology is the theory and practice of design, preparation (production), use (application), management, and evaluation of learning processes and resources (Fardanesh, 2019). The research shows that the role of educational materials and equipment in teaching and learning is “To create tangible materials and devices for thinking as well as real experiences. It provides objective and real information to the learners” (Rezayee, 2019, p.60).

“Educational technology is a systematic method to design, implement, and evaluate the teaching and learning process” (Ahadian, 2013, p. 3). On the other hand, today we see that, due to the use of informational and communicational technology, the role of educational technology in teaching has become very important. In addition, teachers and students see the advantage of educational technology by using various applications such as electronic education, the internet, etc. In this century, huge technological developments have reached various areas of human life. Therefore, currently, education does not lead to reading and writing, even in the primary and elementary grades. Rather, at this stage, students should be trained to learn all the specialized elements that they intend to learn (Nawrozi, 2017).

Problem Statement

Applying educational technology correctly and fundamentally improves educational goals in terms of quantity and quality, and the use of multimedia can help teachers do this. The necessity of using educational technology in terms of media, educational materials, and tools, as well as in terms of management and supervision, seems certain. In order to develop the creativity and development of students, it is necessary to use educational materials and media, appropriate teaching methods, and an emphasis on targeted learning and experience activities. (Manocheharizadeh et al., 2017).

Today, although many of our schools do not have educational conditions based on new learning theories, it should be noted that raising the level of students' awareness, society's conditions, and insisting on old and traditional teaching methods are not effective and appropriate. If teachers do not use technology in their work, they will not achieve satisfactory results. Some school teachers may think that the use of informational and communicational technologies by students is a waste of time, while Robert White believes that the many hours that students spend working with informational and communicational technologies cannot be considered waste in any way. (Zangana, 2013).

Therefore, considering the role and impact of technology on students' deep learning and the role it plays in the thriving and development of students' minds in education, the use of educational technology in boys' high school in Bamyan province is one of the issues that should be investigated and analyzed. Issues such as the effectiveness of technology in education and the perceptions of boys' high school teachers regarding technology as well as its use the lack of utilization of technology in the teaching and learning of students is an important issue in the use of technology in education.

Finally, the effectiveness of technological tools and equipment in education has made us measure the impact of educational technology on the academic progress of boys' high school students in Bamyan province, since changing the opinions and attitudes of teachers and officials should be preferred over changing methods and programs. The only reason for choosing this topic is its educational importance. Another reason is the existence of some content that the use of educational technologies can probably help students understand more and better. The main issue that made us do this research is whether educational technology has an effect on the academic progress of boys' high school students in Bamyan province.

1.1 General Research Objectives

Investigating the impact of educational technology on the academic achievement of boys' high school students in Bamyan province

1.1 Specific Objectives

1. Investigating the benefits of technology in education
2. Investigating the teacher's ideas about the use of technology in education.
3. Investigating the lack of influence of technology on education.
4. Investigating the prerequisites for the use of technology in education
5. Investigating the effectiveness of technological equipment in education

1.2 Research Main Questions

Does educational technology have an effect on the academic progress of boys' high school students in Bamyan province?

1.2.1 Research sub questions

1. What are the benefits of using technology in education?
2. How effective are teachers' ideas about educational technology in education?
3. How effective is technology in education?
4. How effective are the prerequisites for the use of educational technology in education?
5. How effective is technological equipment in education?

1.3 Hypotheses

1.3.1 Main hypothesis

It seems that educational technology has an effect on the academic progress of boys' high school students in Bamyan province.

1.3.2 Sub-hypotheses

1. It seems that the effect of using technology in education is moderate.
2. Probably, the effect of the teacher's ideas about the use of technology on the academic progress of students is moderate.
3. Technology probably has a small effect on the academic progress of students.
4. It seems that the effect of the prerequisites for the use of technology in education on the academic progress of students is moderate.
5. It seems that the influence of technology on education has moderate effectiveness.
6. Research Literature Review

2.1 Theoretical

Every researcher needs to study and review the sources and research of others in order to get enough information about the title and topic of his research. At the same time, the more access to information and previous research related to the project, the more favorable the result will be for the researcher. Therefore, in this chapter, the research literature on the impact of technology on academic progress related to these variables has been reviewed.

2.2 Definition and concepts of technology

In order to enter the discussion in the field of educational technology, the first step is to gain knowledge and awareness in the field of the word technology and the philosophy of its origin. Technology is the method of making and using tools, devices, materials and processes that solve human difficulties. Technology is a human activity and therefore, it is older than knowledge and engineering. In general, it can be said that technology or technology means the regular use of scientific information and other systematic knowledge to perform practical tasks. In simpler terms, technology is the practical application of knowledge and a tool to help human efforts and has a great impact on the development of human societies (Zangana,2014).

2.3 Educational technology

In Persian language, some people consider the word "Fanavari" to mean technology, and some do not. Fardanesh mentions that the word technology or (Technologia) in the Greek language means the systematic practice of an art or profession. The first part of this word (Techno) is a combination of the meaning of an art and a technique, including the knowledge of the principles and the ability to achieve the desired results. In other words, technique means

practical skills such as knowing and doing. The root of the word (logos) also means reasoning, explanation, principle, and presentation. Therefore, technology means the rational or logical application of knowledge, or in other words, technology means any practical skill in which the results of knowledge and scientific findings are used. (Abolhassani,2016).

The definition agreed by the American experts of educational technology and communication: “Educational technology is the theory and practice of design, preparation (production), use (application), management and evaluation of learning processes and resources” (Zangna, 2013, p.110). “Educational technology is a systematic method to design, implement and evaluate the teaching and learning process” (Rezayee, 2018, p. 3).

Today, the word of educational technology carries a progressive and evolved concept and the field of using it is not limited to the use of educational materials and tools because it has a broader and newer concept. First of all, by clarifying its concept and its application field, educational technology can be compared to educational engineering. In this way, an educational technologist can use the techniques he knows to give a plan for education that, while facilitating it, brings faster, more effective and more stable learning. A technologist can help teachers to implement the desired plan carefully and finally evaluate the teacher's teaching as well as the students' learning. Also, educational technology is beyond the use of tools and devices. In this way, educational technology is more than the collection of its different parts. which includes the regular method of designing, implementing and evaluating the entire teaching and learning process using specific goals and using research finding in psychology and human communication and using a combination of human and non-human resources in order to create more effective, deeper and more stable learning. (Ahadian, 2014).

4. Research findings

Table 4.1: Profile of respondents according to age

| Age quantity | Percent | Credit | Percentage |
|-------------------------|-----------|------------|------------|
| Less than 30 years | 36 | 56.3 | 56.3 |
| Between 30 and 40 years | 23 | 35.9 | 35.9 |
| More than 40 years | 5 | 7.8 | 7.8 |
| Total | 64 | 100 | 100 |

As you can see in the above table, the total number of respondents was 64, 36 of whom were under 30 years old, which is 56.3% of all respondents; 23 of them were between 30 and 40 years old; and 5 of them were over 40 years old.

| Table 4: Academic Documents | | | |
|------------------------------------|-----------|------------|-------------------|
| Documents | Quantity | Percent | Credit percentage |
| Diploma degree | 2 | 3.1 | 3.1 |
| Associate degree | 24 | 37.5 | 37.5 |
| Bachelor's degree | 38 | 59.4 | 59.4 |
| Total | 64 | 100 | 100 |

As you can see in table number (2), the total number of respondents was 64; 38 of them had a bachelor's degree, which constitutes 59.4% of the total respondents; 24 of them were associates, which constitutes 37.5% of the total respondents; and 2 of them had diplomas.

Educational technology information and components

| | Advantages of using technology in education | Teacher's ideas | Lack of influence of technology in education | Technology prerequisites | Effectiveness of technology and equipment |
|--------------------|--|------------------------|---|---------------------------------|--|
| QTY | 64 | 64 | 64 | 64 | 64 |
| Average | 4.2017 | 3.1784 | 3.3672 | 3.5295 | 3.6113 |
| Median | 4.2727 | 3.1667 | 3.5000 | 3.7778 | 3.7500 |
| The most frequent | 4.27 | 3.08a | 3.50 | 3.78 | 3.75 |
| Standard deviation | .44403 | .51581 | .52797 | .62471 | .48699 |
| Min | 2.73 | 2.00 | 1.80 | 1.56 | 2.00 |
| Max | 5.00 | 6.17 | 4.30 | 4.78 | 4.50 |
| Total | 268.91 | 203.42 | 215.50 | 225.89 | 231.13 |

In the above table, the average, median, mode, standard deviation, min, max, and set of each of them are shown separately. The highest average is the advantages of using technology in education, and the lowest average is the teacher's ideas.

| Average | The most frequent | Standard deviation | Quantity |
|----------------|--------------------------|---------------------------|-----------------|
| 3.5738 | 3.66 | .32055 | 64 |

As you can see in the above table, the general average of the research was 3.5738, the highest repetition was 3.66, the standard deviation was 32055, and the number of respondents was 64.

Inferential findings

Testing hypotheses

It seems that the effect of using technology in education is moderate.

$H_0=33$

$H_1 \neq 33$

Table 4: The first hypothesis

| | category | Quantity | Observed Prop. | Test Prop. | meaningful |
|--------------|-----------------|-----------------|-----------------------|-------------------|-------------------|
| Group 1 | ≤ 33 | 2 | .03 | .50 | .000 |
| Group 2 | > 33 | 62 | .97 | | |
| Total | | 64 | 1.00 | | |

As you can see in the above table, the value of sig = 0.01 is less than 0.05, so the result is that the zero hypothesis is rejected, which indicates that, according to the participants in the research, the effect of educational technology on the academic progress of students is higher than the assumed average.

- Probably, the effect of the teacher's ideas about the use of technology on the academic progress of students is moderate.

H0=35

h1 ≠35

Table 4: The Second Hypothesis

| Teachers' ideas about the use of educational technology | | | | | |
|--|-----------------|-----------------|-----------------------|-------------------|-------------------|
| | category | Quantity | Observed Prop. | Test Prop. | meaningful |
| Group 1 | <= 35 | 49 | .23 | .50 | .000 |
| Group 2 | > 35 | 64 | .77 | | |
| Total | | 15 | 1.00 | | |

As you can see in the above table, the value of sig = 0.01 is less than 0.05, so the result is that the zero hypothesis is rejected, which indicates that according to the participants of the research, teachers' ideas about the use of educational technology are higher than the assumed average.

- Probably, technology has an effect on the academic progress of students.

H0=30

h1 ≠30

Table 4.6: The third hypothesis

| Lack of influence of technology in education | | | | | |
|---|-----------------|-----------------|-----------------------|-------------------|-------------------|
| | category | Quantity | Observed Prop. | Test Prop. | Meaningful |
| Group 1 | <= 30 | 50 | .78 | .50 | .06 |
| Group 2 | > 30 | 14 | .22 | | |
| Total | | 64 | 1.00 | | |

As you can see in the above table, the value of sig = 0.06 is greater than 0.05, so the result is that the opposite zero hypothesis has been confirmed, which means that according to the participants of the research, educational technology has an effect on the academic progress of students.

- It seems that the effect of the prerequisites for the use of technology in education on the academic progress of students is moderate.

H0=27

h1 ≠27

Table 4.7: The fourth hypothesis

| The influence of educational technology on academic progress | | | | | |
|---|-----------------|-----------------|-----------------------|-------------------|-------------------|
| | Category | Quantity | Observed Prop. | Test Prop. | meaningful |
| Group 1 | <= 27 | 13 | .20 | .50 | .000 |
| Group 2 | > 27 | 51 | .80 | | |
| Total | | 64 | 1.00 | | |

As you can see in the above table, the value of sig = 0.000 is less than 0.05, so the result is that the zero hypothesis has been confirmed, which indicates that, according to the participants in the research, the effect of the prerequisites for the use of technology in education on the academic progress of students is higher than average.

- It seems that the influence of technology in education has moderate effectiveness.

H0=24

h1 ≠24

Table 4.8: The fifth hypothesis the effectiveness of educational technology equipment in education

| Effectiveness of educational technology equipment in education | | | | | |
|---|-----------------|-----------------|-----------------------|-------------------|-------------------|
| | Category | Quantity | Observed Prop. | Test Prop. | Meaningful |
| Group 1 | <= 24 | 10 | .16 | .50 | .000 |
| Group 2 | > 24 | 54 | .84 | | |
| Total | | 64 | 1.00 | | |

As you can see in the above table, the value of sig = 0.000 is less than 0.05, so the result is that the zero hypothesis has been confirmed, which means that according to the participants of the research, educational technology equipment is effective in teaching students.

The main hypothesis is that educational technology has an effect on the academic progress of boys' high school students in Bamyan province.

H0=150

h1 ≠150

Table 4.9: general hypothesis

| The effect of educational technology on academic progress | | | | | |
|--|-----------------|-----------------|-----------------------|-------------------|-------------------|
| | Category | Quantity | Observed Prop. | Test Prop. | meaningful |
| Group 1 | <= 150 | 6 | .09 | .50 | .000 |
| Group 2 | > 150 | 58 | .91 | | |
| Total | | 64 | 1.00 | | |

As you can see in the above table, the value of sig = 0.000 is less than 0.05, so the result is that the zero hypothesis has been confirmed, which indicates that according to the participants of the research, educational technology has a great impact on the academic progress of students.

Conclusion

The purpose of the research was to study the effect of educational technology on the academic progress of boys' high school students in Bamyan province. The dimensions and results obtained are described below.

In the first dimension (benefits of using technology in education), 62 out of 64 respondents confirmed that the use of technology in education is useful and can improve students' academic progress. In the second dimension (the teacher's ideas about the use of educational technology), 77 percent of all respondents confirmed that the teacher's ideas about the use of educational technology have an effect on academic achievement; this hypothesis was also confirmed. In the third dimension (non-use of technology in education), 78% of the respondents disagreed that educational technology does not affect the academic progress of knowledge; therefore, educational technology has an effect on the academic progress of students. This hypothesis was rejected.

In the fourth dimension (prerequisites of educational technology on education), 80% of the respondents confirmed this dimension, so the prerequisites of educational technology have an effect on the academic achievement of students. In the fifth dimension (the effectiveness of technology equipment in education), 84 percent of the respondents confirmed the theory, so educational technology equipment can be effective and influential on the academic progress of students.

In general, five dimensions of the effect of educational technology on academic progress were investigated. The benefits of the use of educational technology in education, the teacher's perceptions about the use of technology in education, the lack of influence of technology in education, the prerequisites of technology in education, and the effectiveness of technology in education—all these hypotheses were confirmed. Except for the lack of influence of technology in education, the dimension with the most agreement was the first dimension. (The benefits of using technology in education)

97% of all respondents confirmed that technology has benefits in education.

Also, the dimension that had the least agreement was the lack of influence of technology on education, for which only 22 percent of all respondents agreed with this hypothesis, and as a result, 91 percent of all respondents confirmed that educational technology has an impact on the academic progress of boys' high school students in Bamyan province.

Finally, it can be said that educational technology has a great impact on the academic progress of high school students. Also, for the academic progress of students, traditional teaching is not responsible, and technology should be used as well.

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