Kurdish Studies
Jan 2024
Volume: 11, No: 2, pp. 5417-5427
ISSN: 2051-4883 (Print) | ISSN 2051-4891 (Online)
www.KurdishStudies.net

Received: December2023 **Accepted**: December2023
DOI: https://doi.org/10.58262/ks.v11i2.392

Educational Technology Standards (IS-TA)[1] In Content of Computer Textbooks for Preparatory Stage in Iraq

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Abstract

The current research aims to analyze the content of computer textbooks for the preparatory stage in the Republic of Iraq according to the standards (IS-TA)[1] for educational technology prepared in light of Standards for educational technology in light of ISTE'S Standards for students and the standards of the Computer Teachers Association CSTA (K-12) for the preparatory stage, and to achieve the research objectives, the two researchers followed the descriptive/analytical research approach, and the research community was determined by the content of computer textbooks for the preparatory stage in Iraq for the year (2021/2022). The research sample was the same community, and a tool was (IS-TA) standards for educational technology. The two researchers verified the validity of the analysis by presenting a percentage (20%) of the analysis sample to a group of experts and arbitrators to verify the validity of the analysis. The percentage of 80% was approved for validity, and the stability of the analysis was verified using two methods (consistency over time and stability across others). The results of the research were that there were (3) axes from the analysis list that did not record any repetition, i.e. (zero) repetition, and they were ranked eighth and last, and the axis (technological control and mastery of electronic applications and services) came in first place, and the total frequencies for the availability of (IS-TA) standards for educational technology (1840) recurrence.

Keywords: *computer textbooks ,Educational technology, preparatory stage*

Research Problem

A number of conferences called for keeping pace with technological developments in various fields, including education, and this was confirmed by the third scientific conference of the Iraqi Society for Educational Studies (Visions for Developing Education in Iraq, 2023) in its recommendations, as it recommended reconsidering some school curricula and building them in a way that keeps pace with modern scientific developments. With its recommendation to enhance digital technology in school and university educational environments, many studies have also recommended integrating technology into education in organized and sequential ways, a study (Radi et al., 2022, 20). Based on the above, the two researchers have specialized in their current study the content of the computer curriculum for

[1] (IS-TA) The first two letters of the International Society for Technology in Educational Technology (ISTE) standards for students and the last two letters of the Computer Science Teachers Association standards for preparatory stage students (CSTA K-12) as it is a tool built in light of the standards. For the two associations

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the preparatory Stage in the Republic of Iraq because it is the stage that is coming the university level, and their knowledge of educational technology standards will help them in their university studies, then postgraduate study, and then their practical life, which is not disruptive And definitely from using technology, and therefore the two researchers decided to analyze computer textbooks for the preparatory Stage in Iraq according to the (IS-TA) standards for educational technology to show the percentage of availability of standards in textbooks. The two researchers prepared an electronic exploratory questionnaire for computer teachers in Iraq, which included a set of questions about the percentages of availability of educational technology standards in computer curricula for the middle school stage in Iraq. (29.5%) of the responses confirmed the lack of standards. Educational technology in the computer textbook for the preparatory stage, while (70.5) responded that it is available in small percentages. Thus, it has become clear that the computer curricula for the preparatory stage in Iraq do not included except a few of those standards.

Research Importance

The rapid development in the field of information and communications technology has made the world a small village that is easy to connect and communicate, and the widespread use of computers and information technology resources has led to a new role for both the teacher and the learner in the educational process.-Learning, as the computer is no longer just a tool designated for calculations only, but rather an effective and influential tool in developing educational skills.-Educational (Jordanian Ministry of Education, 2020, 3), as the use of technology and encouraging learners to use educational technologies-Modern learning and integrating it into the teaching and learning process in a purposeful and organized manner has a positive and effective impact in achieving the goals of the education process (Raji and Muammar, 2022, 61). Many studies have recommended integrating technology into education and preparing school curricula using modern technologies, including the study (Azhar and Istabraq, 2021, 115), and it is necessary to move towards teaching and learning computer science, its tools and applications, and in various fields of our lives, as it is one of the most important technologies of the era (Nasser et al., 2021, 3), as the computer has other dimensions other than being a science that is taught, but rather it is considered a tool for improving education. In all its aspects, as computer educational programs provide opportunities for self-learning (Hussein Wasan, 2017, 280), and because education faces great challenges that must be confronted, as educational institutions are exposed to rapid and profound transformations due to contemporary scientific and technological changes as well as local, regional and global economic, social and developmental changes, This called for a review of the educational reality of educational systems and their components in various countries of the developed world with the aim of developing and modernizing education, which led to the movement of standards and research into standard levels of content, which keep pace with contemporary global trends as they include what every student should know and what he should be able to do. On his performance of skills and the knowledge he knows as a result of his study of a subject (Mahmoud, 2005, 279-282).

The trend of developing education recently has taken into account the return to standard levels in the field of education and considers them among the necessities and tasks that achieve comprehensive development of educational systems in general and curricula in particular (Al-Otaibi, 2013, 244), due to the great importance that international standards enjoy in building and developing curricula as they The standard defines what the curriculum

should include and contains foundations that can be referred to judge the quality of the curriculum and the quality of what the learner knows and is able to perform (Al-Tanawi, 2005, 59), as countries seek to build their curricula according to standards that are necessarily consistent with their priorities and the philosophy of their societies (Maari and Alia (2021, 289) Therefore, developing and improving curricula leads to developing the level of knowledge among learners (Raji and Ibrahim, 2012, 47). It is known that curriculum development must be preceded by an analysis of the current curriculum. Therefore, the two researchers analyzed the computer curriculum for the middle school stage in accordance with educational technology standards to show the percentage of availability of standards in the curriculum.

Research Objectives

The current research aims to:

1. Analysis the content of computer textbooks the For the academic year 2021/2022 For the preparatory stage for a republic of Iraq According to (IS-TA) standards which Proposed for educational technology.
2. Explaining the percentage of availability of the proposed (IS-TA) standards for educational technology in the content of computer textbooks for the preparatory stage in the State of Iraq.

Research Questions

To achieve the research objectives, the following questions were formulated:

1. What educational technology standards should be present in the content of computer textbooks for the preparatory stage in the Republic?
2. What are the availability rates (IS-TA) of Standards which Proposed educational technology in the content of computer textbooks for the preparatory stage in the Republic of Iraq for the academic year 2021/2022?

Research limits: The current research is determined by:

1. **Objectivity Border**

- The Educational technology (IS-TA) standards which proposed in light of the standards of the International Society for Educational Technology (ISTE'S) for students and the Association of Computer Teachers standards CSTA (K-12) For preparatory stage
- Content of Computer textbooks for preparatory stage For the Republic of Iraq, including textbooks below:

- Fourth Preparatory grade (Second Edition / 2021) approved for the academic year 2021/2022.
- Fourth Preparatory grade, (first edition/2021) approved for the academic year 2021/2022.

2. **Time Limits:** Academic year 2021/2022 AD
3. **Spatial Boundaries:** The Republic of Iraq.

Definition of Terms

1- **Standards**: (Al-Saadawi and Saleh, 2016) they define it as "units of measurement in which there is no room for difference or discrepancy in viewpoints, as they refer to specific indicators at the global level." (Al-Saadawi and Saleh, 2016, 28)

2- **Educational Technology** "Employing a system of processes in accordance with specific standards, taking advantage of all available material and non-material capabilities, in an effective manner and with a high degree of mastery and efficiency, in order to achieve a change that meets the learner's need" (Mahdi, 2015, 20)

3- **IS-TA Standards**: The researchers define them procedurally as: standards that were built in light of the (ISTE'S) standards for students and the (CSTA K-12) standards for the preparatory stage, to suit the students and curricula of Iraqi society, as It includes (10) axes and (81) indicators, which are adopted in analyzing the content of the computer curriculum for the preparatory stage approved for the year 2021/2022 in Iraq.

3- **Content of Textbook**: **(Ali, 2011) Define it as** : "The second element of the curriculum and refers to the set of knowledge, skills, attitudes and values that are intended to be imparted to the learners, and it is everything He puts it down Planners The curriculum is based on experiences whether a my experiences were skillful ,or emotional or cognitive with the aim of achieving comprehensive growth, Integrated for the learner, that is, the content is the content of the curriculum and answers the question "What do we study?"(Ali, 2011:33)

4- **Preparatory Stage :** Defined by the Ministry of Education, 1985, as "the three-year stage following the middle stage of secondary education, concerned with consolidating the discovered abilities, skills, and inclinations of students in previous grades and enabling them to reach a higher level of knowledge and skill with diversification and depth in some intellectual fields." and applied studies in preparation for continuing study, and in preparation for productive practical life" (Ministry of Education, 1985, 3-4)[4]

Theoretical Background

Standards

The standard levels determine the learning outcomes at the end of the academic stage, represented by what the learner is intended to know and do at the end of the academic stage (Al-Wakeel and Mahmoud, 2005, 305). Therefore, the two researchers focused on the idea of building special standards for educational technology that can be used in building the content of the computer curriculum according to the characteristics Which these standards should characterize.

Standards Features

International standards are characterized by a set of features and characteristics that differ from one institution to another and from one country to another depending on the nature of the goals it seeks to achieve, but they often have basic characteristics in common between them:

- Accuracy, clarity and applicability.

[4]Secondary School System No. (2) of 1977

- Its connection to society's culture, customs and traditions.
- Continuous Improvement
- Not adopting the principle of the elite, but rather discrimination for all. (Shehata, 2005, 61)
- Objectivity in considering general goals
- Comprehensiveness of all aspects of matters.
- Societal: solving community problems through standards. (Al-Hout, 2004, 68-69)
- (Ethical) in employing standards to serve the prevailing laws and customs of society.
- (Nationalism) Achieving the nation's goals and solving its problems and issues. (Mahmoud, 2005, 458)

Justifications for Interest in International Standards

There are several justifications that call us to pay attention to international standards and to organize the educational process in accordance with them, including:

- The spread of global competition.
- Increasing the orientation of education and its outcomes at the global level.
- The spread of the concept of globalization and the global knowledge society and what results from it. (Hamdan, 1988, 70)

The two researchers believe that international standards are a basic pillar and an effective means of developing and improving education, and they are an imperative tool for achieving equal opportunities.

Educational technology The relationship between education and technology is a mutual and complementary relationship, as they form a homogeneous set of complementary processes whose success depends on the extent of their interaction and interconnection together. Therefore, technology must be integrated into education programs to achieve better learning, and technology is a learning tool that has the ability to overcome the difficulties and obstacles that learners face as well. The learning approaches adopted by educational technology provide many opportunities for formative, gradual, constructive learning by simulating the learners' senses and providing better understanding and understanding, as well as providing some skills such as correct application, elaborate drawing, and performing experiments correctly and ideally. They provide a diversity of experiences and teaching methods, and educational technology also provides Effective services and features for the learning process (Al-Khafaji et al., 2021, 16), and educators believe that educational technology standards have a positive impact on how learners receive information, as they have a positive role in enhancing learning among learners and education among teachers (Mahmoud and Najdat, 2023, 980).

Theories on which Educational Technology is Based

Most of the educational technology sources and books (as far as the two researchers know) did not explicitly mention the theories to which educational technology refers, and merely mentioned (the systems approach and did not address the systems theory to which it refers) and also mentioned the communication stage and did not address the communication theory to which it refers, (the science stage). Behaviorism and did not address the behavioral theory), and it is necessary to clarify the theories to which educational technology refers, as the two

researchers found that it refers to each of the theories: (constructivist theory, behavioral theory, cognitive theory, social theory, systems theory, communication theory). The two researchers

The Foundations on which Educational Technology is Based

(Al-Shahri, 2017) mentioned several foundations on which educational technology is based, making it a necessary choice in developing educational systems and their components. The following points show these foundations:

1- Defining educational objectives in a procedural way that can ensure their achievement and measurement.
2- Applying organized knowledge related to the learner, the education process and its sources, such that this knowledge is derived from psychological behavioral sciences, educational sciences, communication sciences, and others.
3- Using and employing learning resources for effective learning.
4- Based on the systems approach that follows logical, interconnected, sequential steps that can be modified and reviewed.

Adopting learning and communication theories in preparing, designing, applying, developing and using the knowledge to be presented during the educational situation. (Al-Shahri, 2017, 85)

Educational Technology Role in the Educational System

- Organizational function: Educational technology achieves the economic aspect through its organizational function by obtaining the best results at the lowest financial cost and the shortest period of time. It works to shorten time and save effort for the teacher and learner alike.
- Functional orientation: Educational technology plays a fundamental role in guiding learners intellectually, theoretically, and practically.
- Providing information: Educational technology contributes to providing the necessary information to learners in proportion to the nature of the information provided, the age stage, and the teaching method.
- Excitement and motivation: Educational technology plays an important and prominent role in arousing learners' interest and motivating them to learn with the subject studied. (Al-Haila, 2017, 51)

Obstacles to Adopting Educational Technology in the Educational Process

(Shammi and Sameh, 2008) stated a number of difficulties or obstacles that limit and hinder the effective use of modern educational technology in the educational process, and the following points show these difficulties or obstacles:

- A shortage of specialists, experts and technicians necessary to use and apply educational technology in the educational process.
- Most teachers do not believe in the importance of technological means and innovations in education.
- The shortage of devices and technological innovations that serve the educational process.
- Graderooms are not appropriate in terms of design, equipment, and capabilities for the correct use of educational technology.
- Failure to provide adequate training for teachers on using educational technology and

including it in the educational process. (Shammi and Sameh, 2008, 136)

Research Methodology and Procedures

- **Research Methodology:** The two researchers adopted the descriptive research method-Analytical, to analyze the content of computer books for the Republic of Iraq according to (IS-TA) standards for educational technology which prepared in light of the standards of the International Association for Educational Technology ISTE'S for students and the Association of Computer Teachers standards CSTA (k-12) For preparatory stage students.

Research Community Table (1) defines the current research community by the content of computer textbooks for the preparatory stage in Republic of Iraq.

Table (1): Research Community.

Grade	Year/Edition	number of units & chapters	number of pages	The title of the textbook
Fourth preparatory grade	2021/2nd edition	4 unitsn8 chapters	144 pages	the computer
Fifth preparatory grade	2021/1st edition	4 unitsn8 chapters	144 pages	the computer

The Research Sample

The sample in the current research represented the entire research population (computer books for the preparatory stage), Table (1), after excluding (the introduction to the book-content list-Lesson vocabulary list-Learning outcomes for the lesson).

Study Tool: The two researchers adopted criteria (IS-TA) Proposed educational technology prepared in light of the standards of the International Association for Educational Technology for students ISTE'S And the Computer Science Teachers Association standards for preparatory stage students CSTA (K -12).

Analysis Process Procedures: The two researchers analyzed a sample of two computer textbooks for the preparatory stage according to the tool prepared for this purpose with the aim of verifying the validity and reliability of the analysis. The validity of the analysis was verified by presenting a sample of the analyzed material to experts and specialists in curricula and teaching methods, and an agreement rate for the validity of the analysis was approved (80%). From the opinions of experts and arbitrators (Ayal and Jassim, 2019, 284)The consistency was verified using two methods (consistency over time and consistency across others), and the consistency rate was high (96%), after which a complete analysis of the two textbooks conducted.

Table (2): Details of the Analysis Sample for the Purpose of Validity and Reliability of the Analysis.

Number of pages analyzed	Number of chapters	the book
34	2 chapter	Computer textbook for fourth grade / Iraq
20	2 chapter	Computer textbook for fifth grade/Iraq

Analysis Steps

With approval Analysis tool (IS-TA)standards In light of the standards of the International Association for Educational Technology for students ISTE'S And the Computer Science Teachers Association standards CSTA (K -12) for preparatory stage students ,Computer textbooks were analyzed for the preparatory stage in the Republic of Iraq according to the following steps:

1- Prepare a list of six columns to record the results of the analysis.
2- A general preliminary reading of the content of the computer textbook chapters to be analyzed to identify the ideas it contains, so that the repetition of the idea is marked within the indicator to which the idea belongs. Read carefully For (Research sample) for each chapter of the book to be analyzed One or more times.
3- Carefully read the (research sample) for each chapter of the book to be analyzed one or more times.
4- Identifying the phrases contained in the content that carry an idea, whether it is an explicit or implicit idea.
5- Matching the idea contained in the content with the indicators in the analysis list).
6- Calculating the frequency of each idea that included one of the indicators in the analysis list by placing a sign (/) in front of the indicator indicating the idea.
7- Translating the results of the analysis by counting the number of times the indicator indicating the idea was achieved and calculating the percentage for the axis as a whole within the tool.

Statistical Methods

1- Frequencies and percentages calculate the frequencies of each indicator and axis and find the percentage for each axis in the tool.
2- Equation (Cooper) To calculate the percentage of agreement between the arbitrators' opinions.

Presentation and Interpretation of Results

1- Show Results Related to the First Question

What educational technology standards should be present in the content of computer books for the preparatory stage in the Republic of Iraq?

- To answer the first question, a list of standards for educational technology was adopted, called (IS-TA) standards In light of the International Association of Educational Technology standards for students(ISTE'S) and the Association of Computer Teachers standards)CSTA (K-12)For the preparatory stage, after verifying the procedures for validity and reliability, the tool for educational technology standards became (IS-TA) tool that includes educational technology standards that can be adopted in related studies.

2- Show Results Related to the Second Question

What are the availability rates of (IS-TA) Standards which Proposed educational technology in the content of computer textbooks for the preparatory stage in the Republic of Iraq for the academic year 2021/2022?

- To answer the second question, the frequencies and percentages were extracted for each axis of the tool for the two computer textbooks for the preparatory stage in Iraq 2021/2022 AD.

Table (3) Frequencies, Percentages, Ranks and Z Value ,for Percentages of Educational Technology Standards (IS-TA) that Included in Computer Textbooks for the Preparatory Stage In Iraq for the Year 2021-2022 AD.

Seq.	The axis	Computer textbooks for preparatory stage		
		Frequencies	percentage	Rank
1	Digital citizenship, safety issues, and the ethics of using technology	0	0	8
2	Research and information fluency	3	0,16	7
3	Impacts of computing, culture, social interaction, collaboration and communication	0	0	8
4	Cyber security and protecting systems, networks, programs and applications from digital attacks	117	6,36	5
5	Knowledge industry, creativity, innovation and patents	0	0	8
6	The Internet, communication networks and communication (messaging)	112	6,09	6
7	Critical thinking skills and Problem solving and decision making	150	8,15	3
8	Operating systems, operations on them, and basic concepts of databases	147	7,99	4
9	Technological control and mastery of electronic applications and services	725	39,40	1
10	Algorithms and fundamentals Programming and artificial intelligence	586	31,85	2
	the total	1840	100%	

From Table (3) we note that the number of occurrences of (IS-TA) standards Educational technology in the content of computer textbooks for the preparatory stage in Iraq was (1840),The first place for the axes was in favor of the ninth axis (technological control and mastery of electronic applications and services) with a number of repetitions amounting to (725), and the second place was for the availability of the tool axes for the tenth axis (algorithms, programming basics, and artificial intelligence), which recorded a number of repetitions (586), and the following The seventh axis (critical thinking skills, problem solving, and decision-making) ranked third with a frequency of (150), and fourth axis was ranked for the eighth axis (operating systems, operations on them, and basic concepts of databases).The number of its occurrences reached (147) occurrences, and the fifth place went to the fourth axis (cybersecurity and protecting systems, networks, programs and applications from digital attacks), where the number of its occurrences in the content of Iraqi books reached (117) repetitions, while the sixth place went to the sixth axis. (The Internet, communication networks and communication (messaging)) and (112) repetitions, and the third axis (the effects of computing, culture, social interaction, cooperation and communication) came in seventh place due to the availability of standards in the content of Iraqi books with a number of repetitions (3) only and the (first) axis was not recorded, third, fifth) i.e. repetition, i.e. (zero) repetition, and thus it ranked eighth and last.

Conclusions

After presenting and interpreting the results, the researchers concluded the following:

- The axis of (technological control and mastery of applications and electronic services) came in first place, and this indicates the focus and interest of those concerned with developing curricula in Iraq is on controlling ready-made application programs and not on the algorithms and programming that are used in building those application programs, while the focus should have been on The basics of programming and artificial intelligence, which are a basic raw material for building other software applications, to building a productive computer mind programmed for those applications. The direction of the authorities concerned with writing the computer curriculum in the Republic of Iraq may be to make the priority in writing computer curricula in promoting good use of the computer and applications.
- Three topics Recording (zero repetition) in computer curricula, that is a negative indicator, and the content of these books for Iraq must be reconsidered.

Recommendations

In light of the results of the current research, the two researchers present a set of recommendations:

- The two researchers recommend that the relevant authorities work to approve the computer subject as a study subject, starting from the primary stage and possibly even from the kindergarten stage, in line with global trends in this aspect, so that those concerned and responsible for preparing the curricula can distribute the comprehensive topics in a correct and gradual manner within the scope and sequence matrix of the computer subject.
- Including the third intermediate and sixth grades of preparatory stage with computer teaching, making its grade a success requirement only and not including it in ministerial exams.
- Reconsidering the content of the computer curriculum for the middle school stage in Iraq and developing it in accordance with international standards and trends concerned with the computer textbook for that stage to achieve consistency with modern and global trends in building computer curricula.

Suggestions

- Building a (range and sequence) proposed matrix for the computer curriculum for the middle and preparatory stages According to the (IS-TA) standards for educational technology that was built in the current research, and presented to the authorities concerned with preparing curricula for adoption by developing the computer curriculum.
- Analysis of computer textbooks for the intermediate stage in light of (IS-TA) standards for educational technology
- Evaluating the content of computer textbooks for the intermediate stage in Iraq in light of the (IS-TA) standards for educational technology.

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