Developing some Aesthetic Values Using Applications of Augmented Reality among Mainstreaming Students of Preparatory Stage

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Abstract

The study aims to identify the impact of using augmented reality on some aesthetic values among deaf students in the preparatory stage. The sample of the study includes 30 deaf students (males and females) at Al-Amal School for the Deaf and Hard of Hearing in the course of History in Gharbia Governorate. They are divided into two groups: the first one is controlling group of 15 students at Al-Amal School for the Deaf and Hard of Hearing in Al Mahalla Al-Kubra. The second is an experimental one of (15) male and female students at Al-Amal School for the Deaf and Hard of Hearing in Tanta. The study employs two main tools: the scale of aesthetic values "read and translated in sign language"). Then, the following experimental treatment materials were built: a list of aesthetic values, a program based on augmented reality applications, a teacher's guide to teaching the program, and a learner's guide to using the program. There is a statistically significant difference between the mean ranks of the students of the experimental group and the controlling group in the post-application of the aesthetic values scale in favor of the experimental group. In addition, there is a statistically significant difference between the mean ranks of the experimental group students of the aesthetic values scale in the pre and post measurement in favor of the post measurement. In light of the findings, recommendations and suggestions were provided.

Keywords: *Augmented Reality - Aesthetic Values - Mainstreaming Students*

Introduction

Recently, the world witnesses a plethora of developments in all areas of life. Human development through education is the way to achieve progress in a rapidly-changing world for all students with no exception. Rather, it includes all members of society, such as those with special needs. Students with hearing disabilities are among the most important groups of people with special needs. Therefore, they are in dire need of health, social, economic and educational care. The hearing-impaired people are individuals who have rights and duties within society, and neglecting them makes them a burden on society, and disruptive energies that impede development plans.

Hearing-impaired students are divided into two categories: the first is hearing impaired students, who complain of hearing impairment, as they perceive and respond to what is around them as long as the source of the sound falls within the limits of their auditory capabilities. The second category is the deaf students who suffer from a complete loss of hearing. Their sense of hearing is insufficient, even with hearing aids; which negatively affects his acquisition of various

skills. This requires the provision of educational programs suitable for their characteristics and disabilities.

Deaf students suffer from hearing loss, which affects their acquisition of different basic skills and components in various academic subjects including: concepts, such as historical concepts. This may be due to several reasons: first kind of reasons are related to the student himself with what his hearing disability imposed on him, second type of reasons are related to the content of the course of Social Studies, thirdly reasons related to the method of teaching this content, which may not be suitable for the nature of their disability; Which hinders their learning of these concepts. (Sabri Al-Jizawi, 2006: 54).

Values play a major role in shaping the student's personality in the basic education stage. It determines his behavior and makes him able to adapt to life and its difficulties. Therefore, many thinkers were interested in instilling and developing values in the hearts of members of society, as one of the requirements of this era, which is characterized by the dominance of material values that have become the basis for transactions and relationships among individuals. Values are the basic pillar of society. (Aida Neuer, 2010: 41-42)

Aesthetic Values:

Aesthetic values occupy an important aspect among the students. Appreciating such values is a necessity of life. It is also a basis for building an integrated and balanced personality. Life without a sense of beauty leads to boredom. For its spiritual aspect, aesthetic values are one of the goals of general education that teachers seek to achieve through experience and observation (Laila Al-Wakil et al., 2013: 245).

Noran Mhanni (2018: 4-5) postulates that there is a relationship between the study of history and aesthetic values. The study of history is of great importance in educating individuals and promoting their feelings. It also helps to develop a sense of creativity and acquire the ability to appreciate beauty as an essential dimension of human dimensions. It is one of the closest subjects which enables teachers to develop aesthetic values, especially if it is presented in an attractive and interesting way for students. It is rich in situations and events that evoke emotions and feelings that saturate the soul with manifestations of beauty, including shapes, paintings, drawings and colors, and achieving fun and learning simultaneously.

The aesthetic value includes every seminal quality for psychological, social, or ethical considerations that is characterized by a collective feature in use. It is a set of acquired values that the individual embraces that move him towards work and push him to behave in a manner that satisfies others, and affect them. Hence, honesty, moral courage, loyalty and taking responsibility are

aesthetic values that the individual acquires from the society. (Muhammad Al-Jarhi, 2007: 12).

The Curriculum Standard Levels Document issued by the National Authority for Education Quality Assurance and Accreditation (2009: 110) indicated that one of the important priorities of the social studies curriculum in the preparatory stage is the interest in developing values in general and aesthetic values in particular. It also indicated the need to set educational goals that take into account individual differences among learners. The current research adopts some aesthetic values including: love of beauty, love of arts, cleanliness, order, preservation of heritage, good conduct.

In light of the recommendations of many local, Arab and international conferences and seminars, they approved the necessity of presenting the educational curricula in electronic programs to suit the nature of this group and their needs. For instance, the Conference of the Federation of Organizations for the Care of Special Groups and the Handicapped in Egypt (2002) recommended the need to pay attention to this group and prepare curricula commensurate with the nature of disability. In addition, the Third Conference on Special Education in Qatar (2007), the Twelfth Conference of the Gulf Disability Society in the Sultanate of Oman (2012), the Fifth Scientific Conference for People with Special Needs (2012), Communication Technology for People with Visual and Hearing Needs, and the Seventh International Conference on Communication and Information Technology in Cairo (2018) aim to empower people with disabilities.

Augmented Reality:

Since the technology of augmented reality has a set of characteristics that made it spread widely, and its uses in various fields of education and training, the use of this technology in the educational field may face some challenges and restrictions. Hsiao et al (2012) classified these challenges into:

- Familiarity with new technology: by providing training on the use of technology, and providing an educational program for all steps of teaching with technology, such as providing a guide for the teacher.
- Curriculum designing: Content design with augmented reality technology requires additional time. Therefore, it is necessary to take into account the time of design, the time of teaching the content, and the fact that the content is suitable for age and characteristics of the group.
- Environmental challenges: such as the light sensitivity of the technology, as the technology requires adjusting the light in the classroom.

- Kipper & Rampolla (2013) classified the challenges into two categories:
- Technical challenges: such as the challenges of object recognition and the inaccuracy of the digital cameras, sensors or GPS systems, as well as the limitations of some application production tools and devices used.
- Social challenges: such as the extent to which learners accept technology and its spread in the educational environment, in terms of its cost, as well as the lack of privacy. Since one of the main components of this technology is the camera or the geographical location; this may make the user connected to the Internet to receive or send data through the network.
- In light of Akçayır, M & Akçayır, G (2017) study, the challenges of this technology are:
- Educational challenges: such as the lack of sufficient time, the teachers' lack of technological experience, and the overcrowded classes.
- Technical challenges: such as low sensitivity of tag recognition, tablets, and internet connection.
- Cabero-Almenara & Barroso-Osuna (2016) concluded that the challenges are based on:
- Lack of teacher training and improvement, Lack of typical educational experiences, Lack of conceptual foundations, Lack of educational research, and Lack of institutional support.

After reviewing the challenges facing augmented reality technology, it can be summarized that these challenges can be addressed, avoided, and overcome positively by following some suggestions when designing and using them by teachers and learners alike. After reviewing studies (Aseel Al-Mubarak, 2018, 154). -147; Ahmed Farahat, 2019, 41-42), the challenges facing augmented reality technology can be overcome through a set of procedures:

- Disseminating local and international experiences in educational institutions that have used augmented reality technology and exchanging experiences among them.
- Spreading awareness of the concept of augmented reality technology and its areas of use in education or other fields, through holding conferences and courses, and through various media and communication networks.

Augmented reality and teaching social studies:
There are suggestions for employing augmented reality technology in teaching and learning social studies:
Ghosun Elayan (2017: 555-556) stated that augmented reality technology can be employed through several roles:

- ☐ The role of the teacher: This requires spreading augmented reality technology as an important educational technology in teaching and learning social studies, and providing training courses that explain to teachers how to apply augmented reality. Plus, the teacher teaches social studies to learners through the means of augmented reality via their mobile phones and their personal computers, and creates geographical and historical activities that support the social studies lesson.
- The role of the student: the student can employ the technology of augmented reality while learning social studies. Classroom and extracurricular educational activities are designed to enhance the learning of historical concepts and knowledge. The student must also obtain training on how to employ the technology of augmented reality in social studies learning, whether for the average student or those with special needs. In addition, guidance can be provided to the student about augmented reality.
- The role of the school administration: the administration should encourage the teacher to use augmented reality technology, provide opportunities to obtain free training for the application of augmented reality in various educational stages and various courses, and participate in the design of textbooks to convert them into augmented books supported by video clips, audio and 3D images. The school administration also can provide opportunities for live broadcasting by targeting specific sites such as historical monuments through reading comprehension topics, and the embodiment of historical and national figures in social studies topics. This contributes to providing technical educational content for all levels and ages.

The study of Efstathiou et al (2017) stresses on identifying the effectiveness of augmented reality based on inquiry to develop historical thinking and empathy skills. The study sample consisted of (50) third-grade students. The researchers used the semi-experimental approach. The first is experimental group combines (12) and the other is controlling group includes (20) students, with the exclusion of (8) students. Its tools were a test of historical thinking skills, in addition to individual interviews. The results showed that historical thinking and empathy skills increased after employing augmented reality technology through a field trip by means of augmented reality technology and a traditional field trip.

The study of Schiavi et al (2018) applied augmented reality technology as an addition to support history lessons in secondary schools in France. The researchers used the semi-experimental approach, and its sample consisted of (26) high school students in France on the subject of Mesopotamia. Its tools are an opinion poll and an achievement test in history. The results showed the ability of this technology to use classroom activities compared to its implementation without it, by (75%) using the technology, and (25%) without it.

Augmented Reality and the Hearing Impaired (Deaf People):

The application of modern technology in education for people with special needs has become very important, because learning these individuals needs an interesting and attractive method, which is difficult to do with traditional methods.

Muhammad Obeid (2018) aimed to verify the effectiveness of augmented reality in developing some of the skills of students with hearing disabilities in the computer course in the preparatory stage and their attitudes towards it. His sample consisted of a group of (10) students with hearing disabilities in the first grade of preparatory schools in The Kingdom of Bahrain. The sample was divided into two groups: controlling groups of (5) students and an experimental group of (5) students. An E-learning environment based on educational cards was designed using augmented reality technology. The research concluded the effectiveness of augmented reality in developing some of the skills of students with hearing disabilities in the computer course in preparatory stage and their attitudes towards it.

Azza Abdel-Rahim`s (2022) study aimed at developing computer awareness in its three fields of knowledge: skill, cognition and emotional aspect among deaf and hard-of-hearing students in the first grade of middle school by designing an e-learning environment using augmented reality technology. The sample consisted of (9) students from the first grade of middle school at Al-Amal School for the Deaf And the hearing impaired in Sohag. He used the semi-experimental design based on one group. The research found the effect of using augmented reality technology in the e-learning environment to develop computer literacy among deaf and hard-of-hearing students in the first grade of middle school.

Accordingly, the researcher was able to benefit from the literature reviewing the advantages of augmented reality when used with all types of students, especially the hearing-impaired (deaf) students in various educational stages. In addition to relying on scientific and philosophical theories that prove its ability to achieve public and private educational goals, there are many motives behind relying on augmented reality with that group of deaf students, and the appropriateness of using it with students of that age, in addition to the existence of a close link between augmented reality and its ability to develop aesthetic values.

Procedures:

The research methodology depends mainly on the urgent necessity to build an educational program based on augmented reality in social studies for deaf students. The researcher get accustomed to the problem through observation during the period of practical education at Al-Amal School for the Deaf and Hard of Hearing in Tanta while obtaining a professional diploma in Special Education. During this period, he noticed that the teaching method used with these students is controlled by recitation using sign language on the part of the teacher and observation on the part of the student, which makes the student passive and does not respond to what he explains. The teacher does not allow students to practice thinking, reasoning, and meditation freely without restriction.

To verify the research problem, the researcher performed the following:

Personal interviews: The researcher conducted unstructured interviews with (2) instructors of the social studies subject of (Al-Amal for the Deaf and Hard of Hearing) schools in Gharbia Governorate, and (4) teachers of social studies in the preparatory stage, as well as some parents and students. The most prominent questions were:

- To what extent are the ways and methods of teaching the curriculum is suitable for deaf students?
- To what extent are the curriculum and teachers interested in developing the aesthetic values?

Their answers manifested the inappropriateness of the methods of teaching the curriculum, the difficulty of acquiring it and the weakness of aesthetic values among students. They also stressed the need to prepare new programs and methods that depend on the visual aspect and modern technologies such as augmented reality.

An Exploratory study: The researcher applied an exploratory test of historical concepts and a measure of aesthetic values, which were applied to a sample of (10) first-grade middle school students at Al-Amal School for the Deaf and Hard of Hearing in Tanta, Gharbia Governorate. (9) students with a rate of (90%) below the average, while only (1) students with a score of (10%) achieved above average.

The current research adopts the following methods:

First: The descriptive approach: was employed in preparing the theoretical framework related to augmented reality, aesthetic values, and deaf students, and building the two research tools.

Second: The Quasi-experimental approach: was used in the field application of the program to ensure its effectiveness, and the application of research tools (scale of aesthetic values) on the research sample.

The Limits of the Research:

First: Human limits: A sample of (30) male and female students was selected from the first preparatory grade students at Al-Amal Schools for the Deaf and Hard of Hearing. They are divided into two groups:

A controlling group of (15) male and female students from Al-Amal School for the Deaf and Hard of Hearing in Al-Mahalla Al-Kubra Center.

An experimental group of (15) male and female students from Al-Amal School for the Deaf and Hard of Hearing in Tanta Center.

Second: Objective limits: The current research was limited to:

Two unit (Some Manifestations of Ancient Egyptian Civilization, The history of Egypt and its Civilization in the Era of the Ptolemies and the Romans) in the book of social studies (History Section) in the second semester of the academic year 2021/2022 AD, which are allocated for deaf students in the first year of middle school (Some aesthetic values).

Third: Spatial limits: Al-Amal School for the Deaf and Hard of Hearing in Tanta, Gharbia Governorate

Fourth: Time limits: Research tools were applied in the second semester of the academic year 2021/2022.

• The research tools consisted of a scale of aesthetic values in history for deaf students in the first grade of middle school (prepared by the researcher).

The goal of the scale:

The scale aims to measure some of the aesthetic values of the deaf students in the first year of middle school after studying the content of the two units (Some Manifestations of Ancient Egyptian Civilization, The history of Egypt and its Civilization in the Era of the Ptolemies and the Romans) included in the program based on augmented reality applications, by comparing the scores of the pre-measurement and the post-measurement to the same group.

The Dimensions of the Scale:

The dimensions of the scale were determined in the light of a list of aesthetic values, which were previously prepared. The scale included six dimensions, which are the following value: love of beauty, love of arts, cleanliness, order, etiquette of good treatment and conduct, preservation of heritage).

Table (1) Distribution of the values situations of the scale of aesthetic values

No.	Values	Distribution of situations	Number	Percentage
1	Beauty	1, 7, 13, 20, 23, 27	6	20%
2	Love of the arts	2, 8, 14	3	10%
3	Cleanliness	3, 9, 15, 19, 26	5	17%
4	Discipline	4, 10, 16, 21, 24, 29	6	20%
5	Heritage Preservation	5, 11, 17, 25	4	13%
6	Good Manners	6, 12, 18, 22, 28, 30	6	20%
	Total	30	30	100%

The Survey Application of the scale:

An exploratory experiment for the scale was conducted on (30) deaf students in the first preparatory grade at Al-Amal

School for the Deaf and Hard of Hearing in Tanta and Mahalla Al-Kubra in Gharbia Governorate, on Wednesday 12/8/2021 AD, and Thursday 12/9/2021 AD; In order to verify the psychometric characteristics, namely:

The validity of the scale of aesthetic values was initially calculated using Face Validity by presenting the test to a group of experienced arbitrators in the field of curricula, teaching methods and psychology to judge it. The opinions of the arbitrators confirmed the validity of most of the questions.

The stability of the scale was calculated:

Using Cronbach's alpha equation

The stability coefficient of the aesthetic values scale was calculated using Cronbach's alpha equation. The stability coefficient of the scale was (0.864) for the total expressions, and (0.768, 0.714, 0.750, 0.755, 0.720, 0.740) for the sub-dimensions, respectively, which are statistically significant coefficients.

Using the Split-Half Method:

Table (2) shows the stability coefficients for the scale (n = 30)

Dimension	Correlative coefficient Before Correcting Sperman Brown	Correlative coefficient after Correcting
The Scale as a whole	,789	,882

The stability coefficient for the scale was (0.882), which is statistically significant coefficient.

The Implementation of the Research Experiment:
The Pre-application of research tools:

Before starting to use the program, the researcher held training sessions with the school's social studies teacher, social worker, and certified sign language interpreter for training them on how to implement the program, for a period of three days; an hour and a half per day (three sessions).

Then the researcher applied the scale of the aesthetic values of the two units (Some Manifestations of Ancient Egyptian Civilization, The history of Egypt and its Civilization in the Era of the Ptolemies and the Romans) to the two research groups (the experimental group at Al-Amal School for the Deaf and Hard of Hearing in Tanta) on Sunday 27/2/2022, while the controlling group was conducted at Al-Amal School for the Deaf and Hard of Hearing in the Mahalla Al-Kubra District of the East Al-Mahalla Al-Kubra Administration in Gharbia Governorate on Monday 2/28/2022 AD.

Teaching the program:

The teaching of the program began with the second and third units (Some Manifestations of Ancient Egyptian Civilization, The history of Egypt and its Civilization in the Era of the Ptolemies and the Romans), which are scheduled to be taught in the second semester of the academic year

2021/2022 AD, from Sunday (3/6/2022) until Monday (17/3/2020) for a period of six consecutive weeks, with two sessions per week, as shown in the following table:

Table (3) The time plan for teaching the program in the second semester

Subject	Unit	Time allotted
The first Unit: Some of the Masterpieces of our Civilization: The Manifestations of the Ancient Egyptian Civilization	The first: Social life	2 sessions (70 minutes)
	The second: cultural and intellectual life	2 sessions (70 minutes)
	Third: Architecture and Arts	2 sessions (70 minutes)
The second Unit: Aspects of Government in Egypt between the Ptolemies and the Romans	The first: Egypt in the era of the Ptolemies	2 sessions (70 minutes)
	The second: manifestations of civilization in the era of the Ptolemies	2 sessions (70 minutes)
	Third: Egypt in the era of the Romans	2 sessions (70 minutes)
Total		12 sessions (420 minutes)

The post-application of research tools:

After completing the program, the aesthetic values scale test was applied to the research group as follows:

- The aesthetic values scale was applied on Wednesday, 4/20/2022 AD, to the experimental group at Al-Amal School for the Deaf and Hard of Hearing in Tanta, and on Thursday, 4/21/2022 AD to the controlling group. The aim is to investigate the impact of the program based on augmented reality applications on developing aesthetic values among deaf students in the first grade of preparatory school.
- Eighth: The difficulties that the researcher encountered during the application, and how to overcome them:
- The low numbers of regular students with daily attendance for the research sample. Hence, the researcher was obliged to choose the controlling group from Al-Amal School for the Deaf and Hard of Hearing in Mahalla Al-Kubra Center, and the experimental group from Al-Amal School for the Deaf and Hard of Hearing in Tanta.
- The limited space of the classrooms in both schools, and the lack of devices, tools, and aids in the application. The researcher overcame such problems through the use of the "Technology Development Center", which has sufficient spaces and seats for the sample "experimental group".
- Many augmented learning objects, especially three-dimensional ones, need a high-quality Internet. Therefore, the researcher provided:

- Two Wi-Fi antennas and a subscription to an internet package of 30 GB; Thus, the Internet was provided to (15) students (sample members).
- The researcher encountered the problem of some parents' intransigence and their refusal to take their children with their mobile phones to school, because they alleged that their children misuse it. Therefore, the researcher went to the practical education groups in the school and talked with them to allow them to provide their mobile phones to the students (sample members) during the implementation of the experiment, who expressed their desire and assistance to the researcher.
- While the researcher is printing copies of the content for the experimental group, he notices that there are some shapes that the phone camera does not detect. Thus, the educational three-dimensional figure does not appear, so the researcher reprogrammed some forms, and re-printed again. The reason for this problem is that the application does not detect some dark colors, especially if there are texts in them.
- Some students' copies were destroyed or lost. This forced the researcher to print new copies and distribute them again.
- The absence of a specialist in sign language interpretation to assist the researcher and the subject teacher. This was overcome through the researcher's assistance to a sign language translation specialist and a social worker in solving personal and psychological problems that the researcher might face during the application.

The time of class sessions does not exceed (35) minutes. This problem was overcome by coordinating with the school administration to combine two classes together to have enough time to present the program and solve the questions and activities associated with each lesson.

The Used Statistical Methods in Data Analysis and Testing Hypotheses:

The statistical package for social sciences (SPSS) program was used to perform the statistical treatment. The statistical methods used in the current research are the following:

Coefficient Correlation: to calculate the validity of the internal consistency of the two study tools.

Cronbach's alpha and Qudrichardson's 21 equations: to calculate the stability of the two study tools.

Chi-square test: to calculate the size of the effect resulting from the training of students on the program.

Mann–Whitney U test: to find out the differences between the experimental and controlling groups in the pre and post measurements.

Results:

In light of the methodology and the statistical methods, the study concludes the following:

- Verifying the validity of the statistical hypothesis, which states that "there is a statistically significant difference between the mean ranks of the students of the experimental

group and the controlling group in the post application of the scale of aesthetic values in favor of the experimental group."

To test the validity of this hypothesis, the researcher used the Mann-Whitney test to find out the differences between the experimental and controlling groups in the post-application of the total score of the aesthetic values scale for deaf students in the first grade of middle school, and the following table shows it:

Table (4): The significance of the differences between the mean ranks of the experimental and controlling groups in the post-application of the aesthetic values scale.

Dimensions	Groups	Number	Mean ranks	Total ranks	U	Significance level
Love of beauty	Experimental	15	8,20	123,00	3,00	0,01
	Controlling	15	22,80	342,00		
Love of the arts	Experimental	15	8,07	121,00	1,00	0,01
	Controlling	15	22,93	344,00		
Cleanliness	Experimental	15	8,20	123,00	3,00	0,01
	Controlling	15	22,80	342,00		
Discipline	Experimental	15	8,03	120,50	00,50	0,01
	Controlling	15	22,97	344,50		
Heritage Preservation	Experimental	15	8,00	120,00	00,00	0,01
	Controlling	15	23,00	345,00		
Good Manners	Experimental	15	8,13	122,00	2,00	0,01
	Controlling	15	22,87	343,00		
Total Score	Experimental	15	8,00	120,00	00,00	0,01
	Controlling	15	23,00	345,00		

Tabular U value at 0.05 level = 72, while tabular U value at 0.01 level = 56

The arithmetic mean and standard deviation of the post-measurement were calculated for each of the two groups, and this is evident from the following table:

Table (5): The arithmetic means and standard deviation of the post application of the scale and the total score of the aesthetic values scale for the experimental and controlling groups.

Dimensions	Controlling		Experimental		The size of effect
	arithmetic mean	standard deviation	arithmetic mean	standard deviation	
Love of beauty	10,20	1.74	16.26	1.53	0,87
Love of the arts	4,46	0.990	7.73	0.798	0,88
Cleanliness	7,06	1.75	13.06	1.03	0,90
Discipline	8,80	1.82	15.06	1.38	0,88
Heritage preservation	6.33	1.49	10.73	0.593	0,89
Good Manners	9.66	1.91	14.60	1.24	0,84
Total Score	46.53	3.58	77.46	3.64	0,97

Table (6): The arithmetic means and standard deviation of the pre and post application of the scale and the total score of the aesthetic values scale for the experimental and controlling groups.

Dimensions	Pre-measurement		Post-measurement		The size of effect
	arithmetic mean	standard deviation	arithmetic mean	standard deviation	
Love of beauty	10,13	1.50	16.26	1.53	0,89
Love of the arts	4,86	1,24	7.73	0.798	0,81
Cleanliness	8,40	1.05	13.06	1.03	0,91
Discipline	8,46	1.40	15.06	1.38	0,92
Heritage preservation	5,86	1.12	10.73	0.593	0,93
Good Manners	9,46	1.72	14.60	1.24	0,86
Total Score	47,20	3.80	77.46	3.64	0,97

In order to find out the amount of change in the dimensions of the scale of aesthetic values and the total score, the arithmetic mean and standard deviation were calculated for the pre and post measurements of the control group, and the following table shows this:

Table (7): The arithmetic means and standard deviation of the pre and post measurements of dimensions and the total score of the aesthetic values scale of the control group

Dimensions	Pre-measurement		Post-measurement	
	arithmetic mean	standard deviation	arithmetic mean	standard deviation
Love of beauty	9,46	1.24	10.20	1.74
Love of the arts	4,80	1,08	4.46	0.990
Cleanliness	7,86	1.45	7.06	1.75
Discipline	8,93	1.86	8.80	1.82
Heritage preservation	5,53	0,915	6.33	1,49
Good Manners	8,80	1.32	9.66	1.91
Total Score	45,40	2,92	46.53	3.58

Discussion:

- In light of Table (4), it is likely that the values of (U) to determine the differences between the experimental and controlling groups in the post-measurement were (3.00, 1.00, 3.00, 0.50, 0.00, 2.00, 0.00) respectively, which are statistically significant values at the level (0.01). This indicates that there are differences between the two groups in favor of the largest group in the average ranks of the scale of aesthetic values, which is the experimental group,

and to know the direction of the differences in the experimental and control groups.

- according to table (5), the arithmetic mean of the experimental group is greater than the arithmetic mean of the controlling group. This indicates the superiority of the experimental group over the control group. It is also clear that the effect size is large (greater than 0.5), and this is an indication of the effectiveness of the program for the measurement of aesthetic values among the members of the experimental group.

- Table (6) manifests that the arithmetic mean of the experimental group in the post-test is greater than the arithmetic mean of the controlling group in the pre-measurement. This indicates the superiority of the experimental group in the post-measurement over the pre-measurement. It is also clear that the effect size is large (greater than 0.5), which illustrates the effectiveness of the program based on augmented reality applications in developing aesthetic values among the members of the experimental group between the pre and post application of the dimensions of the scale and the total score of the scale of aesthetic values.

- It is clear from Table (7) that the arithmetic mean of the controlling group in the post-application is close to the arithmetic mean of the controlling group in the pre-measurement. This indicates the stability of the performance of the controlling group, and the stability of the effect of the experimental group's superiority in the post-measurement. It is an indicator of the effectiveness of the program based on augmented reality applications in developing the aesthetic values of the experimental group members.

Therefore, the findings of the research can be interpreted in the light of the following considerations:

1) The program's use of modern learning methods (applications of augmented reality) raised the motivation of the students and created suspense to receive the information in a new way.

2) The addition of many fixed and animated images, two- and three-dimensional images, videos, graphics, and multiple visual illustrations while displaying the content enriched the visual side of the students and help them retain information for a long time.

3) Presenting the content of the program (fixed and animated images, 3D models, videos, illustrations, and diagrams), which highlight the beauty of ancient Egyptian antiquities, relying on the sense of sight, had a great impact on the development of those aesthetic values.

4) Seeking help from specialists in sign language through a certified trainer within the software made it easier for students to understand the content correctly.

5) Relying on a teacher's guide that contains a huge amount of artistic activities that require simulation of some ancient Egyptian antiquities, such as making a model of the pyramids and the Sphinx, and a group of ancient Egyptian obelisks, taking into account the availability of these aesthetic values.

Conclusion:

In sum, it is stated that the use of the program based on augmented reality applications led to the development of the aesthetic values under investigation in the current research. In addition, the use of augmented reality applications creates excitement and suspense among the students. Hence, the teachers preferred to use the application; It has distinctive features that are far beyond reach for traditional programs.

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