

The effectiveness of an experimental program based on science fiction to develop the skill of originality among second-grade students in the fine arts, and its impact on students' attitudes towards the skill of originality

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Abstract

The study aimed to measure the effect of a proposed experimental program based on science fiction to develop the skill of originality in the fine arts among second-grade students in the Sultanate of Oman, and to reveal the effect of the proposed experimental program based on science fiction to develop the skill of originality attributed to gender, and to measure its effect on developing positive attitudes towards the skill of originality. To achieve the study objectives, the research employed the quasi-experimental approach. The study materials and tools consisted of the proposed teaching unit and its implementation guide, the student activity booklet, the pre- and post-tests, and a questionnaire measuring the attitude towards the originality skill. After verifying the validity and reliability of the study materials and tools, they were applied to a sample of 112 male and female students, who were selected using the cluster sample method, using the simple random technique. The study results indicated that there were statistically significant differences at the significance level ($\alpha \leq 0.05$) between the averages of students' scores in the post-application to measure the originality skill between the experimental group and the control group in favor of the experimental group. There were no differences in gender and originality skill at the significance level ($\alpha \leq 0.05$) between males and females in the post-test of the experimental group. The study results also showed that the students' positive attitudes towards the originality skill were large. The study recommended benefiting from the results of the pilot program in subjecting teachers to programs and training courses in order to develop teaching skills in science fiction to develop the skill of originality, and benefiting from innovative thinking tests in fine arts curricula and including activities, images and exercises in science fiction with second-grade students to develop the skill of originality. It also presented proposals for building and experimenting with training programs and designing curricula and editions of teacher guides in science fiction.

Keywords: science fiction, originality, fine arts.

Introduction

Modern teaching methods have developed rapidly; which made the curricula keep pace with these developments in a dynamic manner, as the curricula are among the important elements in the educational system to advance the educational process, and a system of education systems aimed at developing the individual and society and preparing the good citizen, and instilling positive values and trends in him, and the curricula are among the important subjects that help students reach advanced stages in acquiring knowledge and science, and work to refine their talents and inclinations, according to the developments taking place in all areas of economic, social and cultural life as seen by (Chara , 2023), and are among the necessities in building the individual's personality and increasing his productivity to become an active and productive part of his society (Talbot, 2018). Fine art is an essential part of these curricula and represents a reflection of the visual world, based on balance, development and communication with the outside world; It is characterized by uniqueness, originality and imagination (Khalil, 2020). Art gives life its renewed image, and gives education a different existence to become learning for life and for life, and good teaching gives minds productive work habits characterized by creative and innovative thinking and constructive analysis, which puts the mind in important processes for the continuity of lifelong learning (Luis, 2023). The Sixth International Conference of the College of Education at Sultan Qaboos University, which bore the title of Art Education and Contemporary Challenges for Keeping Fine Arts Curricula in Touch with Modern Developments, emphasized among its recommendations the interest in curricula and the developments occurring in them, according to the foundations and standards in fine arts materials so that they stimulate creative thinking skills (Sultan Qaboos University, 2019).

Innovative thinking skills include fluency, flexibility, originality, sensitivity to problems, and imagination. Originality came as uniqueness and novelty in creating unfamiliar and rare ideas. They are new and unique ideas that help the student to move from the real world to the exciting and attractive virtual world for others. They work to activate the memory and direct its path towards uniqueness with future ideas based on the student's previous experience and level of intelligence (Avci & Durak, 2023). Hence, the relationship between science fiction and the skill of originality lies in the ability of students to create rare ideas that include getting out of the ordinary. When the creator and innovator deals with imagination in one of his topics, he is able to free himself from ambiguity and produce artistic works characterized by originality of meanings, and includes artistic elements in a strong and original product (Barak & Yuan, 2021). The current study is based on the Metacognitive theory, thinking about thinking by its owner Flavell in 1976, which is a theory that achieves higher levels of thinking, and includes the ability to plan and put something in long-term memory,

Then the process of monitoring and evaluation, as planning is done through the existence of a codified plan before the actual behavior that contains self-directed goals, and the process of following up on the plan is completed by the person asking himself many questions and trying to answer them, and monitoring that is based on selection and application according to the effect of the action, and finally evaluation that judges and evaluates ideas and activities and makes important decisions about them (Julianna, 2016). This theory is linked to science fiction through the innovative thinking processes that the student performs, in the real and familiar world, represented in the correct planning of ideas and setting specific goals for the ideas that the student imagines, which transfer him to an unfamiliar world, making him in a state of astonishment and surprise from the imaginary ideas, until the transition stage comes after that to monitoring by acquiring ideas related to the content of what he will implement, and from there he moves to the evaluation stage that depends on the ideas and imaginary drawings he has reached, with which his broad thought is launched, applying that on the ground (Hussein, 2023). From all of the above, the role of the school curriculum in developing the skill of originality emerges, which is considered one of the most prominent skills of innovative thinking, through the rich educational content that must accommodate efficient teaching techniques, which should produce a student who is original in his life thinking.

The trend, which is the other variable in this study, is, as the current study adopts, a readiness that the student should have in a dynamic form that reflects the student's inclinations and response towards the skill of originality. Therefore, it needs to be developed and deepened and requires training, dialogue and persuasion. The teacher should be familiar with all these modern tools, and it is natural that it is measured by the research tool adopted by this study. The trend in this sense is a basic characteristic that educational studies and research are interested in measuring and deepening in the souls of students; because it is part of the learner's personality and a basic function of the school of the future. (Javier et al, 2020). see that attitudes consist of three components: a cognitive component, which includes the information, knowledge, beliefs and ideas that the student believes in about a specific topic, an emotional component, which is the result of the student's conviction of the value that is the subject of the lesson and interacting with it in a positive way. Thus, the student who has positive attitudes towards the skill of authenticity will accept it and feel happy while learning it, unlike the student who has negative attitudes towards the skill of authenticity. The last component is the behavioral component, which includes the

individual's behavior towards the subject of study and his response to it. All of these components require training and development for the student. There are also a number of factors that can affect the attitude and push it towards positivity, perhaps the most prominent of which, as (Ton, 2011) sees, is the use of effective teaching methods that create a kind of active learning in the classroom, while school learning and its advanced patterns play a major role in modifying students' attitudes, whether intentionally or unintentionally, Accordingly, students' acquisition of positive attitudes and the removal of negative attitudes are among the most important functions in modern education, especially if they are towards scientific thinking and the skill of originality.

The study problem and questions

In educational literature, a number of studies aimed to focus on developing innovative thinking skills through proposed programs in science fiction, including studies (Jalal 2017, Jamagh 2018; Hassan 2014, Hassouna 2016, Abdel Aal 2017, Ayada 2019, Kalb 2020, Youssef 2018, Morsi 2016, Veronica et al. 2024, Putt 2011), Which included recommendations including science fiction novels for students in school curricula, building educational programs based on science fiction for all educational levels, employing imagination and innovation in artistic products, and urging teachers to stimulate science fiction for their students through discussion, activities, and enrichment programs. Based on field visits to schools and teaching and supervisory experience in this field, researchers note the lack of students' activation of science fiction in their artistic works, and the weakness of the element of innovation and development among them. To verify the existence of a research problem, a survey was conducted on five educational supervisors and five female educational supervisors. The supervisors explained that the curriculum was limited to only one teaching unit for the second grade, which is somewhat of a shortcoming in meeting the requirements of science fiction to achieve the skill of originality. Ten fine arts teachers were also interviewed at the Omani Society for Fine Arts studio, and it became clear that the fine arts curriculum for the second grade needs more educational activities that develop the skill of originality through science fiction. Through analyzing the supervisory visit forms for teachers of individual skills subjects, it was noted that the classroom visit evaluation items do not address the activation of science fiction for the fine arts curriculum in developing the skill of originality. From the above, it can be determined the importance of building a proposed experimental program based on science fiction to develop the skill of originality in the fine arts curriculum for second grade students.

Measuring the level of attitudes towards the skill of originality through the proposed experimental program is another goal that this study is interested in measuring. Julianto et al. (2022) decides that generating positive attitudes in students' thinking processes and encouraging them to adopt effective learning patterns, and working to erase negative attitudes from their educational memory towards creative thinking skills that usually require a specific mental effort is something that educational curricula in the twenty-first century school should take care of. From this standpoint, this study is also interested in measuring the level of attitudes of second-grade students towards the skill of originality, which is one of the creative thinking skills. In general, curricula that maintain the development of positive attitudes and provide useful educational content for students to help them form good attitudes towards learning skills are curricula that can be judged as effective (Jake, 2013). Therefore, the problem of the current study is determined by studying the effect of a proposed experimental program based on science fiction to develop the skill of originality in the fine arts curriculum for second-grade students, and measuring the level of attitudes of second-grade students towards the skill of originality.

The following questions are derived from this research problem:

1. Are there statistically significant differences at the significance level (0.05) (α) between the students' performance in the originality skill between the experimental group and the control group in the post-application?
2. Are there statistically significant differences at the significance level (0.05) (α) in the originality skill attributed to the gender of the experimental group in the post-application?
3. What is the level of attitudes of second-grade students towards the originality skill?

Study objectives

1. Identify the effect of the proposed experimental program based on science fiction to develop the originality skill in the fine arts curriculum at the significance level ($\alpha \leq 0.05$) among second-grade students.
2. Discover the effect of the proposed experimental program based on science fiction to develop the originality skill in the fine arts curriculum at the significance level ($\alpha \leq 0.05$) attributed to gender.
3. Measure the level of attitudes of second-grade students towards the originality skill.

Importance of the study

Preparing a proposed experimental program based on science fiction to develop the originality skill for the second grade, and preparing a student activity booklet for the second grade in science fiction. This study coincides with the efforts of the Ministry of Education according to the National Education Strategy 2040, and supports the policy of the philosophy of education in the Sultanate of Oman that focuses on developing science fiction skills. It will also provide data on the originality skill in the fine arts curriculum, and provide the educational field with a proposed teaching unit and a guide for it, and standardized tests, not to mention that it measures the level of attitudes of second grade students towards the originality skill.

Study Limits

1. **Objective Limits:** The skill of originality in the fine arts curriculum, and measuring attitudes towards it.
2. **Temporal Limits:** The second semester of the academic year 2023/2024
3. **Spatial Limits:** The Sultanate of Oman, Sohar Governorate.
4. **Human Limits:** Second grade students.

Study Terms

1. Science fiction: Moving from the familiar world of reality to the unfamiliar world through drawing and coloring, and imagining future ideas and things in light of new facts, in which ideas are innovative and guide the individual in the present and future, leading to the development of the skill of originality (Stanley, 2023) and science fiction is defined for the purposes of this study as the ability of second-grade students to imagine things in the educational curriculum in a new, unfamiliar way that depends on several dimensions of divergent thinking, and is measured by the research tools provided by this study.

2. Originality: (Ali, 2011, p. 218) defined it as novelty and uniqueness, i.e. the unfamiliar production that no one has preceded, and the idea is called original if it is not subject to common ideas and is characterized by distinction, and the person with the original thought is the one who gets bored of using repeated ideas and traditional solutions to problems. Originality is defined procedurally for the purpose of this study as the rare and unique ideas that help the student to move from the real world to the exciting virtual world that attracts others and works to activate the memory and direct its path towards the uniqueness of future ideas based on the development of scientific imagination in students, and it will be measured through the procedural tools adopted by the study.

3. Fine Arts: (Joseph, 2023) defined it as one of the subjects in the various stages of education that takes from the various artistic fields (drawing, photography, sculpture, ceramics, formation, etc.) a basic focus for applied artistic practices, aiming to educate through art to enable students to acquire the necessary knowledge, skills and values that help them keep pace with the requirements of life in its various aspects, and contribute to building the personality of individuals in a manner that keeps pace with the goals and values of society. Fine arts are procedurally defined as an educational subject based on a set of knowledge and skills. Knowledge is represented in artistic and implied concepts, positive values and attitudes, and skills in the steps of organizing the work of the fields of art in drawing, design, photography, printing and sculpture. It works to arouse students' motivation to learn through images and models, and to activate effective teaching strategies.

Study methodology and procedures

The study relied on the quasi-experimental approach in dealing with human phenomena.

Table 1

The non-equivalent control group design used in the study			
Group (Type)	Study Tool Application	Processing	Study Tool Application
Experimental (male +	Torrance Test (Pre)	Study the unit by method	Test
Controller (males +	Torrance Test (Pre)	Study the unit by method	Torrance Test

Table 1 shows that the study followed the experimental approach with an unequal control group design, by applying Torrance pre-tests to the experimental group and the control group. The groups consisted of two experimental groups and two control groups, with the study of the proposed experimental program using its innovative methods, and studying the control group using the traditional method, then applying Torrance post-tests in innovative thinking to the experimental and control groups.

Study community and sample

The study community consisted of all second-grade students in the schools of Sohar Governorate in the Sultanate of Oman, in the academic year 2023-2024, numbering 2945 male and female students, of whom 1436 male students, representing 48%, and 1509 female students, representing 51%, distributed over 21 schools in the first cycle (Ministry of Education (2023). As for the study sample, four classes were selected using the cluster sample method using the simple random technique from a total of 104 classrooms, and the sample included 28 male and female students in One semester, distributed over 56 male and female students, included two experimental groups in the pre-test and post-test, and 56 male and female students distributed over two control groups in the pre-test and post-test. They were selected randomly by lottery, with the neutralization of extraneous factors that could affect the results of the study. Thus, the study sample consisted of 112 male and female students.

Study materials and tools

Study materials: Teacher's guide - Proposed teaching unit - Student activity booklet.

Study tools: Pre-test and post-test in innovative thinking, in addition to a questionnaire measuring attitudes towards originality skill among second grade students in the Sultanate of Oman.

Validity and reliability of study materials and tools

The validity of the study materials and tools was measured by presenting them to a group of arbitrators from university professors in the specialization at Sultan Qaboos University, Sohar University, and the Scientific College of Design, and some supervisors of fine arts in the Ministry of Education, and some curriculum specialists in the Department of Curriculum Development of Fine Arts and some professors with specialization in the Ministry of Education in the Department of Educational Supervision, and some fine arts teachers in first cycle schools. As for measuring the stability of the test, it was done by applying it to a survey sample consisting of 30 male and female students, and ensuring the stability of the scale by retesting it after three weeks, and calculating the correlation coefficients using Pearson between the scores of the survey sample for both the first and second applications. The correlation coefficient between the scores of the first and second applications reached 0.95. As for the questionnaire, its validity was found through the validity of the arbitrators by presenting it to a number of specialists and study experts to express their opinion on it, while its stability was measured by calculating the internal consistency using the Cronbach's alpha equation, and the stability value reached 0.894, which is a very good value for judging the stability of the questionnaire.

Study results and discussion

1. **Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) between the students' performance in the originality skill between the experimental group and the control group in the post-application?**

To answer the question, the arithmetic means and standard deviations of the students' performance in the originality skill for the experimental group and the control group in the post-application were extracted:

Table 2

T-test for samples to indicate the significance of the differences between the means of the experimental and control groups in the skill of originality								
Variable	Experimental (n = 56)		Controller (n - 56)		df Degrees of freedom	T- value	Plausible value	Effect size η^2
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation				
Post- application	277.4	24.82	146.9	44.40	110	19.20	00.0	0.77

Table 2 shows that there are statistically significant differences between the average scores of the experimental and control groups in the post-application of the originality skill, in favor of the experimental group. This is evident from the probability value Sig = 0.00 and the arithmetic mean of the experimental group, which was 277.4 and the standard deviation = 24.82 SD, while the arithmetic mean of the control group was 146.9 and the standard deviation = 44.40 SD. The data were interpreted with this treatment based on the formulation of the

question or hypothesis. This can be explained by the fact that the proposed experimental program based on science fiction had a positive effect on the experimental group, and this may be due to several factors, including: the quality of the activities, exercises and applications provided to students, which were formulated in a way that develops the originality skill in active interactive ways, and effective practices coupled with instructions for their implementation, had a positive effect on the results of applying the post-innovative thinking tests, and the acquisition of new elements, concepts and treatments in science fiction.

The interaction of the experimental group in viewing more pictures and imaginary models established among the students the idea of forming new ideas and inventing innovative designs in science fiction, and that the program provided an opportunity for students to express imaginative ideas and transform mental images into images on the ground, and that the teacher's division of the teaching unit of lessons into stages in terms of preparation, presentation, implementation, defining concepts with sound and image, and arranging information in a way that suits the learner's environment and reinforcement may have helped positively about what was produced by the students in influencing the effectiveness of the program based on science fiction and developing the skill of originality.

Activating a science fiction program through various strategies, including fictional stories, narrating imaginary events, impersonating imaginary characters, life in the sky and on clouds, and fishing from a cup of water, may have helped students form new mental images that were not familiar to them before. Also, teaching the study unit with the presence of a student activity booklet based on initial planning and drawing science fiction shapes may have a reason for giving students the opportunity to put imaginary images in their minds in a flexible way and arrange the shapes and imagine before applying them in the booklet. This may have led to linking the topics and presenting them in an innovative way outside the familiar framework. Perhaps teaching the proposed experimental program based on science fiction to develop the skill of originality in the fine arts curriculum through distance learning after a new experience with the use of some modern technologies that attract students towards learning, such as the educational channel that was designed for this purpose, which the implementing teacher employed in the experimental program, may have provided an opportunity for students to learn in an exciting way that attracts them, as well as employing the Duo phone application, which helped to transfer the impact of learning in a positive way, may have helped in obtaining this result.

Thus, the results of the current study were consistent with the results of most studies, including: (Jalal 2017, Jamaa 2018, Hassan 2016, Hassouna 2017, Abdel Aal, 2019, Ayada 2020, Kalb 2016) and among these studies (Moore 2018, 2016, Mahmoud 2016, Morsi 2014, Youssef, whose results were consistent with the results of this study, Putt's study (2011), which included the inclusion of science fiction novels for students in the curricula, so that they include critical and artistic readings. It was consistent with the results of Youssef's study (2018), which confirmed that science fiction has many importance that provide the student of fine arts and its students with various skills, and Abdel Aal's study (2019), whose results showed statistically significant differences between the average scores of the research group students in the pre- and post-applications in favor of the post-application, and this indicates the effectiveness of the program based on science fiction stories using effective teaching strategies in developing and improving the level of science fiction Creative thinking and visual appreciation among primary school students differed from the results of the study (Barents et al., 2003), which investigated the effect of science fiction in the absence of differences in favor of students in the experimental group.

2. Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) in the originality skill attributed to the gender of the experimental group in the post-application?

Knowledge of the differences in the originality skill attributed to the gender of the members of the experimental group in the post-application, the "t" test for independent samples was used, and Table 3 shows these results.

Table 3

(T) test for differences in originality skill attributed to gender for the experimental group in the post-application							
originality skill	Males (n = 28)		Females (n - 28)		T-value	Degrees of freedom	Plausible value
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Post-application	277.32	25.07	277.57	25.03	0.04	54	.970

Table 3 shows that the value of "t" reached 0.04 with a probability value of 970.Sig, which is bigger than the significance level as0.05; where the arithmetic mean of the experimental group in the post-application for males appeared as 277.32 =M, and the standard deviation was 25.07 =SD, while the arithmetic mean value of the experimental group in the post-application for females appeared as 277.57 =M, while the standard deviation for

females appeared as 25.03 =SD; which indicates that there are no statistically significant differences in the originality skill attributed to gender in the two experimental groups in the post-application and that the average is equal between males and females. The absence of gender differences between males and females in the post-tests of the experimental group in measuring the originality skill can be explained as follows: The age characteristics between males and females in the formal perception stage are close, and through them the student can transfer his ideas and emotions, as they are considered keys to growth in all physical, psychological, mental and emotional aspects according to what psychologists classified the Ministry of Education (2018), and that the integration of male and female students into the basic education system from the early stages from the first grade to the fourth grade in the first cycle schools in the Sultanate of Oman enabled similar learning opportunities between them; therefore, both male and female students made a big effort and interrupted their learning and training in science fiction to develop the originality skill; which resulted in the absence of statistically significant differences between the two genders in the skills of the experimental program, as it was noted during the follow-up of the actual application that the teachers of both the experimental and control groups made a big effort in the level and quality of teaching for both male and female human types; The period of time that both male and female students spent learning the science fiction teaching unit was suitable for acquiring more ideas and activities in science fiction and developing the skill of originality. Also, mental formation is determined by genetic factors, and after the largest part of measuring the difference and similarity through innovative thinking tests, which are due to genetic reasons, and the absence of differences between female and male students may be due to the presence of parents and family at home and around their children; which has had a positive impact on consolidating some positive and genetic elements such as intelligence in the minds of male and female students and that they are distributed according to their intelligence. And that imaginative drawing depends on the line and its directions, and it depends largely on the flexibility and flexibility of the hand in drawing and continuity in the line, and is one of the reasons that explain the absence of differences in the flexibility of the hand during drawing between males and females, as indicated by Rashid (2014).

Thus, the results of the current study are consistent with the results of studies that indicate no differences between males and females in the experimental group, including a study by the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2018) on equality between males and females in the opportunity for education; which gives the opportunity for a high degree of similarity between them in performance and skills of drawing and initial planning. The results of this study also agree with the results of Abu Shawer's study (2017) on developing science fiction skills between males and females by preparing an educational program in imagination skills and acquiring more activities; which indicates that there are no differences between male and female students.

3. What is the level of attitudes of second grade students towards the skill of originality?

To answer this question, Table 4 shows the arithmetic means, standard deviations and the level of attitudes regarding the skill of originality.

Table 4					
Arithmetic means, standard deviations, and level of attitude toward the skill of originality					
s	Topics	Number of paragraphs	Arithmetic mean	Standard deviation	Trend level
1	Benefits of the originality skill	10	3.66	.284	Big
2	Apply the originality skill	10	4.20	.341	Big
3	Grand total	20	3.93	.245	Big

Conclusion

Table 4 shows that the arithmetic averages of the level of attitude towards the skill of originality were all at a high level, as the total average of the tool was 3.93 with a standard deviation of 245, while the arithmetic average of the axis of the benefits of the skill of originality was 3.66 with a standard deviation of 284, while the second axis, the axis of applying the skill of originality only, had an arithmetic average of 4.20 with a standard deviation of 341. All these estimates indicate that the attitudes of second-grade students are high towards the skill of originality, as they like to apply and practice it in the educational process by trying to think outside the box when solving educational activities and answering questions of classroom discussions and practicing cooperative learning. This is consistent with the results of the first question in its data, and perhaps this is due to the effectiveness of the experimental program that was implemented with modern teaching methods, in addition to the presence of a special booklet for implementing educational activities through which the student practices practical applications, and activating the electronic channel that helped create enjoyable learning. All of these tools played a role in encouraging students towards the skill of originality. Practicing the skill of originality in the educational process makes the student directly penetrate beyond knowledge, and this state makes him feel a degree of scientific ecstasy. Among the most prominent skills that received high ratings in the attitude scale are: I feel that the skill of originality arouses my interest in learning with an arithmetic mean of 4.32, followed by the skill I believe that the skill of originality enriches my scientific imagination with an arithmetic mean of 4.30, and then the skill I prefer to activate the skill of originality in all my educational work with an arithmetic mean of 3.41. These are all indicators that the attitudes towards the skill of originality are big.

Study Recommendations

1. Subjecting second-grade teachers to training courses, programs, and workshops in order to develop teaching skills in science fiction.
2. Benefiting from innovative thinking tests in fine arts curricula with second-grade students to develop science fiction and originality.
3. Including activities, exercises, imaginative images, strategies, teaching methods, and innovative approaches in fine arts curricula for second-grade.
4. Benefiting from preparing a student activity booklet and what it includes of activities, exercises, and methods of strengthening science fiction to develop the skill of originality in fine arts curricula.
5. Maintaining the level of major trends towards the skill of originality by practicing effective teaching patterns.

Study suggestions

Building and experimenting with training programs that include pre- and post-tests, a guidebook, teaching units, and activity sheets for students in science fiction to develop the skill of originality for the second grade. Conducting more research and studies in science fiction to develop the skill of originality in the fine arts curriculum for the second grade to increase knowledge and awareness about the importance of science fiction and its role in the educational process. Working on building and preparing experimental editions of teacher guides in science fiction to develop the skill of originality in a group of schools to verify their effectiveness before implementation.

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