THE EFFECT OF A SIMULATION PROGRAM ON STUDENTS AT THE COLLEGE OF EDUCATION'S ACQUISITION OF HAND EMBROIDERY SKILLS

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ABSTRACT

The impact of simulation programs on the educational environment for students in higher education has to be further investigated because there are not many researches about their use in the field of education. Therefore, the current study aimed to know t the effect of a simulation program on students at the College of Education's acquisition of hand embroidery skills. Twenty students from Najran University's College of Education took part. Twenty-four students from Najran University's College of Education took part in the study. Twelve students each from the experimental and control groups were randomly assigned to each group. Whereas the control group took the identical course in the conventional manner while the experimental group used a simulation program to study the "hand embroidery" course. The study's goal was accomplished by using an instrument called a product evaluation card. The simulation program was proven successful at improving the pupils' hand embroidery skills. The outcomes offer significant support for the benefits of simulation programs in research and educational advancement.

Keywords: A simulation program; Home Economics; hand embroidery; spinning; fabrics

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INTRODUCTION

Numerous studies have suggested that the simulation programs can significantly improve instruction and learning [1-4]. The simulation programs provide smooth communication between the physical and virtual worlds. The ability to manipulate virtual things in the actual world while using and borrowing a flexible and physical user interface is also provided [5, 6]. As a result, the simulation programs are becoming increasingly widely used and influential in both the commercial and educational communities [7, 8]. It has just reached a point of maturity where both mobile and non-mobile devices can use its apps [9, 10]. However, there aren't many research that have been done in the area of education [11, 12]. Researchers and industry professionals that support the usage of simulation programs think that it gives students more chances to become more skillful and educated [13, 14].

Additionally, by providing virtual information outside of the user's immediate environment, simulation programs strive to make life easier for the user. Additionally, to any objective that is not directly related to the real world, like live video streaming. In terms of recognition technology, the simulation programs' features can be divided into image-based and location-based simulation programs [15, 16], where digital information is layered on top of monitored images and amplified information is provided by image-based simulation algorithms [17-19]. Location-based simulation programs, on the contrary, provides virtual information and calculations of the user's real-world location. In addition, diagnose the area and the image are used [20, 21]. Furthermore, location-based simulation systems make sure that the user is presented with contextually relevant virtual data in geographically meaningful locations [2, 22]. Programs that use images to simulate situations can help students gain practical skills, conceptual understanding of knowledge, and spatial aptitude [16, 23].

Using needle and thread or yarn, hand embroidery is a type of handicraft used to decorate textiles or other materials [24, 25]. By stitching several materials onto a layer of cloth to create patterns, it is primarily done for decorative purposes. Additionally, designs frequently mirror the splendor of nature. Fashionistas over the world love hand needlework for its variety of patterns [26]. It is frequently utilized in costume necklines, waistlines, cuffs, and bodices. Hand stitching is typically used to provide depth and texture to clothing [27, 28]. Additionally, the findings of several investigations revealed that hand needlework has been used in a variety of textile products from the Middle Ages to the present, including pillows, garments, and curtains [29, 30]. The fit and appearance of clothing were also a result of hand embroidery [31, 32]. The pertinent literature research has not yet found evidence of a concerted effort to the simulation programs to improve hand embroidery techniques. The goal of the current study is to determine how using the simulation programs will affect the development of hand embroidery skills.

The problem of the current study arose due to the noticeable and repeated decrease in the skills of the students of the Department of Home Economics in the "hand embroidery" course, which hinders the achievement of the objectives of that course. The simulation programs have great potential in enhancing the learning and teaching processes and achieving educational goals [2, 33, 34]. Researchers and experts who promote the use of the simulation programs believe that it provides learners with more opportunities to be more skilled and knowledgeable [35]. In addition, the simulation programs are a particularly attractive technology, which is one of its important characteristics, as it is believed that the simulation programs encourages learners to benefit from it [36].

A garment's fit and appearance are also influenced by hand embroidery [37]. Hand embroidery involves a number of goals, including regulating the fabric's fullness by creating ensembles and enhancing the garment's elasticity through the combination of stitches, pattern, weave, and threads. These goals must be coordinated and occasionally given precedence in order to find a suitable solution. He thinks that using simulation software can help you improve your hand stitching skills and raise the quality of your work. This offers numerous opportunities to use a variety of embroidery stitches, patterns, fabrics, and threads to make significant progress. Therefore, it is important to look into how the simulation program affects the precision and make-up of hand embroidery stitches [38]. The effectiveness of the simulation software in helping female students at Najran University's College of Education strengthen their stitching abilities is unknown, though.

Based on the foregoing, the goal of the current study is to determine the effect of a simulation program on students at the College of Education's acquisition of hand embroidery skills.

METHODOLOGY

To determine the effect of the independent variable (a simulation program) on the dependent variable (hand embroidery skills), the methodology of the study used an experimental approach (with quasi-experimental designs), and as a result, the design shown in Table (1) was used using two groups (experimental and control).

Table (1): Study design

	Treatment	Post-test
Experimental Group	A simulation program	Product evaluation card
Control Group	Traditional way	

Research Tool (Product Evaluation Card)

To gauge the level of proficiency of the study sample in handmade embroidery skills, a product evaluation card was created. By guaranteeing the soundness and clarity of the procedural text on the card and the ability to evaluate performance using it, the validity of the card is established. The Cooper equation was used to determine the coefficient of agreement between the estimates of the several observers on one student's performance in order to determine the stability of the product assessment card.

$$\text{Agreement ratio} = \frac{\text{The total number of agreed-upon subskills}}{\text{The total number of agreed-upon subskills + the number of subskills there have been disagreements on}} \times 100$$

Two female departmental colleagues from the home economics program help with this. After giving the product evaluation card to them, they inquired about its contents and usage guidelines. Then, after watching three of the students perform, determine the degree of agreement between the three observers for each individual student. The coefficient of agreement between observers on the work of the three students is displayed in the table below.

Table (2): Agreement rate amongst observers regarding the performance of the three female students

Coefficient of agreement on the performance of the first student	Coefficient of agreement on the performance of the second student	Coefficient of agreement on the performance of the third student	Average agreement coefficient for the three female students
86%	85%	88%	84%

According to the previous table, the three female students had an average coefficient of agreement of (84%), which indicates that the product assessment card is stable enough to be used as a measurement tool

RESEARCH SAMPLE

With an average age of 17.9 years and a standard deviation of 3.2, the sample for the current study included (24) female students enrolled in the College of Education at Najran University during the first semester of the year 2021/2022 AD. Twelve female students from each group of the experimental and control were randomly assigned to each group. While the control group took the same course in the conventional manner, the experimental group used a simulation program technique to study the "hand embroidery" course

EXPERIMENTAL PROCESSING MATERIAL

A simulation program places the learner in an authentic physical and social situation that is fundamentally connected with topical and constructivist learning theory [39]. To create a set of suggested steps that could accomplish the goals of the "Hand Embroidery" course, an evaluation of many instructional design approaches was done. In contrast, the educational strategy used to teach this course included defining the goal—the improvement of hand embroidery skills among female students—as well as the course's content, a paper book, investigational conditions, instructional videos made available through simulation program technology and in-class activities, and evaluation.

The system that gives these skills to the students in the experimental group was created using the MATLAB application. When looking for simulation programs, it was clear that this application was one of the most well-liked and commonly utilized software [40, 41]. It offers a better user interface and gives users more flexibility. The experimental group's students only had to study one lesson using this program, which used simulation to illustrate the knitting stitches in the book. Thus, utilizing the simulation tool, students in the experimental group can quickly and affordably study the specifics of each skill they have learnt. The students in the control group used traditional instruction to practically hone their hand embroidery skills, supported by instructional videos similar to those shown to the experimental group using simulation program technology (by projecting them on the wall of the classroom).

STATISTICAL PROCESSING

The Independent t test was used to measure the difference between the mean scores of the participants in the experimental and control groups in order to analyze the data gathered, primarily to evaluate the students' abilities in hand embroidery.

RESULTS

In order to find out if there are statistically significant differences between the experimental and control groups because of the use of simulation program technology, the arithmetic mean scores for the post-application of the product evaluation card for the two study groups were extracted. The results of the T test to compare the mean scores of hand embroidery abilities for the two study groups are shown in Table 3.

Table (3): The discrepancy between the experimental and control study groups' mean hand embroidery skill

Group	M	SD	T. Ratio	Sig.
Experimental Group	25.3	1.92	6.71	.035
Control Group	19.7	2.34		

The difference in the mean scores of hand needlework skills for the two study groups (experimental and control) for the value of "t" was 6.71, as can be seen from the previous table. Students in the experimental group received an average grade of 25.3. The pupils in the control group received an average score of 19.7. As a result, we determine that the value of "t" is statistically significant. In this situation, statistical significance is biased in favor of the group with the highest average, which in this case is the experimental group because its arithmetic mean was (25.3), up (5.6) from the control group. This demonstrates, that there is a statistically significant difference at the level (0.05) between the mean scores of the experimental group's students (those who were studied using simulation program technology). In addition, the control group's students (those who were studied using traditional methods) in terms of hand embroidery skills, favoring the experimental group's students. As a result, the study arrived at its conclusion.

DISCUSSION

The primary goal of the current study was to determine how employing a simulation program affected female students at Najran University's College of Education's ability to learn hand needlework. The study's findings support the idea that a simulation program was successful in improving and honing the hand embroidery skills of the female students who took part in the experimental group. Female students who studied using a simulation program in the experimental group performed better on average than their counterparts in the control group, who learnt using a more conventional teaching strategy accompanied by in-class educational videos. In other words, this study shows how a simulation program helped the female participants in the experimental group improve their hand stitching skills. This is largely due to the fact that a well created simulation environment can assist learners in connecting the task to real-world contexts and generating new meanings for them [42-44]. This outcome further supports the notion that, when used fully, the simulation software is a very adaptable instrument that can be employed in a variety of educational contexts and settings and for very various purposes [45, 46]. The aforementioned results are consistent with earlier research on traditional science education [47-49]. This is so that learners can be actively involved in learning processes and have their abilities improved [9, 39] through the advantages and useful uses of simulation programs. [50, 51].

RECOMMENDATIONS

In light of the study's findings, I advocate the following strategies:

- Educating the instructional staff on how to use simulation programs in the classroom.

- Developing hand embroidery with the aid of other various technical goods.

SUGGESTED RESEARCH

Given the research issue, the following recommendations might be made:

- Similar investigations and study at a different educational level to confirm the effectiveness of applying simulation program technology in other settings.

- Developing hand needlework skills through more research and studies using virtual reality.

- Employing the project technique to carry out research to improve hand embroidery abilities for detection.

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