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The impact of using electronic mental maps to develop creative thinking of students in the design of expressive clothes

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Abstract

E-Mapping is an active learning strategy and an effective tool for memory enhancement and retrieval and generating new and unfamiliar creative ideas, where it helps to accelerate learning and knowledge discovery faster by drawing a blueprint that illustrates the basic concept and the main ideas and subsidiary and conducts this self-learning activity, From this, the idea of the research was determined in an attempt to develop the mental maps in accordance with the expressive fashion design course for the students of the master program in the clothing and textile department at the Faculty of Home Economics, King Abdulaziz University, through the use of electronic mental maps in the development of creative thinking of students in the design of expressive clothing, the problem of research has been identified in the following questions:

1. What is the possibility to use of electronic mental maps in the design of expressive clothing?
2. What is the impact of the use of electronic mental maps in the development of creative thinking of students in the design of expressive clothes?

The aim of the research was to use electronic mental maps in the design of expressive clothing, and measuring the impact of the use of electronic mental maps in the development of creative thinking of students in the design of expressive clothes, and to highlight the role played by mental maps strategy in the educational situation in opening the way for students to recognize and express their creativity and express it.

The research followed the semi-experimental approach using one-set design (pre/ post) with the aim of identifying the impact of the independent variable (use of mental maps) on the dependent variable (creative thinking of female students).

The experimental study was applied to the number of (9) students of the master's program in Specialty (Fashion Design) at the Department of Clothing and Textiles, Faculty of Home Economics, King Abdul Aziz University. Using the scale of creative performance of students (tribal / post). The results showed that the statistical value of "z" is a function at ($\alpha \leq 0.05$) level, indicating a statistically significant difference between the average scores of the experimental group's students in the tribal and post application on the scale of creative performance (as a whole) In each component of its components (fluency, flexibility, originality) in favor of the post-performance, Thus, the researcher can accept the hypothesis, which states: There is a statistically significant difference at the level ($\alpha \leq 0.05$) between the average grades of the students of the experimental group in the tribal and post application on the scale of creative performance (as a whole) In each component of its components (fluency, flexibility, originality) for the benefit of telemetry. the researcher can attribute the disparity in performance on the scale of creative performance (as a whole) to the effect of processing using the electronic mental maps in which the researcher used appropriate teaching methods to achieve the objectives of specific teaching positions, in which the students move from teaching method to another method.

The researcher recommended the application of the study in the mental maps to other courses that need to acquire knowledge skills to improve the teaching process, and to search for and focus on all that is new and new in the educational process, especially the modern teaching strategies and conducting similar research in clothing and textile courses.

Keywords: Electronic mental maps, Creative thinking, Design of Expressive Clothes, Clothing and Textile students, King Abdul Aziz University

1.Introduction

When the century of using the mind began, it was realized that the creative mind is the mind that uses all its parts, which led to the emergence of a trend to develop awareness that human creative potential is greater than what we previously thought. When we use the skills of one half of the brain, the amount of creativity will be negligible compared to what we will get when using both left and right hemispheres, creative possibilities are unlimited. From here, the Scientist (Tony Busan) developed what is known as Mind Maps, one of the most important thinking and expression methods, It is a picture of visual thinking that is one of the highest levels of thinking, the mental maps are an effective educational strategy that links reading information by graphics and words In the form of a map, where the reading idea is transformed into short forms mixed with colors and

shapes, it is a quick technique that helps the teacher and the learner to organize well for knowledge and skill building. The right brain is involved in this with his tasks (color, music, spatial perception, imagination, Daydream, dimensions), and all tasks that require the vision of the whole picture, and the left part with his tasks (Sequence - speaking - logic - numbers - lists – analysis), (Bozan: 2006).

Electronic Mind Maps is an active learning strategy and an effective tool for memory enhancement, information retrieval and generating new and unfamiliar creative ideas,

It helps to speed up learning and discover knowledge faster by drawing a blueprint that illustrates the basic concept and main and secondary ideas. Performs this activity the self –educated, it also works in the same way as the human mind, which helps to activate and use the naughty brain and arrange information in a way that helps the mind to read and recall information rather than traditional linear thinking to study problems and develop strategies in a nonlinear way and is prepared through computer programs (Arafa, 2006).

According to al-Rifai (2006) the applications of mental maps are not limited to increasing capacity Innovation and artistic creativity, but also extend to help the student whatever his specialty in:

To summarize books, documents and written lectures

- Linking the results of audio lectures.
- Planning of scientific projects, working meetings and press interviews
- Negotiate with the other party in order to convince and influence him.
- Planning events for design and innovation processes and creating useful ideas in all areas of design.

The mental maps have been applied in many fields, especially in teaching. There are many studies that dealt with the use of electronic mental maps in teaching, including:

Which confirmed that electronic mental maps help teachers to communicate with their students and build an experience that they engage in and easy to remember, students also found that the process of recording ideas visually is very enjoyable, whether to record notes to remember what they studied or to make presentations compared to the traditional way Where mental maps help reduce a large amount of information in some images.(Margulies,2004) study. It also challenges students to develop their visual abilities because each person has an optical memory to remember images stronger than Remember words. So it was found that the combination of words and images facilitates learning and understanding as it facilitates memory and performance, and mental maps helps students to choose and build the installation of information and integration in a meaningful way, the study also confirmed that mental maps help to convey ideas more clearly because it reflect in simple way the ideas in the form of drawing, which is useful in all subjects, but not limited to specific materials, as for the study of (Trevino,2006), It aimed to use the strategy of the graphic schemes and electronic mental maps in the teaching of the life science unit of the biological material of the seventh grade students, and divided the study sample into three groups first learn using strategies of graphic schemes, and the second using the strategy of mental maps, the third is a control unit that teaches the unit in the traditional way, the results of the study showed that there were statistically significant differences between the first, second and third group in favor of the first group which it was learned with graphic schemes. The study recommended applying the strategy of the drawings and electronic mental maps for the students in the other subjects. The study of (Mohamed, 2013) showed the extent of the effectiveness of teaching in the mental maps in the development of creative thinking and cognitive achievement in the subject of home economics at middle school girls and the speed of understanding and remembering. the study (Hanafi, 2015) revealed the possibility of using mental maps programs in the analysis of the aesthetic values of the product, the results confirm that the use of mental maps in the analysis of the aesthetic values of the product gives the designer a comprehensive and organized picture of the most important details, and it represents a method of sophisticated thought that works to operate the brain tissue at the same time.

Some studies also dealt with the use of mental maps in the field of clothing and textiles, including the study of (rabe and Abdul Fattah, 2010)Which aims to measure the effectiveness of mental maps in the acquisition of knowledge and skills in parts of the curriculum of hand embroidery and the comparison of different teaching strategies, and it has been confirmed that mental maps have had an effective impact in the development of the cognitive side and the skillful side and it excelled the style of teaching in the traditional way. and the study (Al-Masri, 2015), which used mental maps in the development of innovation in the process of designing printed upholstery fabrics through the use of a new method of thinking based on the use of forms only without the use of words, which makes the mind to make mental links and the rings arrived leading to the unleashing of innovative thought for the student. It also proved that the students' use of the mental maps in designing the design idea has contributed to the release of all ideas and information in one sheet, which greatly helped to arrange and organize the technical data to reach a good and innovative design idea.

1.1 Problem of the Study

A review of previous studies shows that previous studies did not address the use of mental maps in the teaching of fashion design courses. as the methods used to teach fashion design courses and the tools that the student usually uses when recording notes whether words, lists, lines, arrangement or sequences that stimulate the mental skills of the left half of the brain, as for the skills of the other half of the brain are not used, which

wastes a large part of his mental potential that can be exploited in the creation of modern design ideas and his distinguished by originality. The researcher saw the possibility of using mental maps in the teaching of general design courses and the design of special expressive clothing, It also considers the importance of teaching the method of drawing the mental map for students to use in the development of design ideas, which helps the student to organize her ideas and technical tools which are existing between her hands, then it will be easier to her to imagine and generate innovative and unusual ideas that should be the design idea, the research problem stems from the fact that the traditional methods of teaching the Book design expressive clothing for MS students may not be suitable for all students. There is a group that cannot translate what are between their hands of elements, color schemes and technical methods into acceptable design ideas, Many of them resorted to copying, which prevents the emergence of any creative thought or a distinctive work of art, from that The idea of research in the attempt to develop the mental maps was restricted in accordance with the book of fashion expression Design for the students of the master program in clothing and textile department at the Faculty of Home Economics, King Abdul Aziz University, through the use of electronic mental maps in developing the creative thinking of female students in the design of expressive clothing.

1.2 Questions of the Study

1. What is the possibility to use the electronic mental maps in the design of expressive clothing?
2. What is the impact of the using of electronic mental maps in developing the creative thinking of female students in the design of expressive clothes?

1.3 Research hypothesis

In the light of the results of research, previous studies and research objectives, the following hypothesis was formulated:

- There is a statistically significant difference at the level ($\alpha<0.05$) between the mean grade scores of the experimental group students in the pre and post- applications on the creative performance scale (as a whole) and each component of its components (fluency, flexibility, originality) for the benefit of telemetry.

1.4 Research goals

1. Use of electronic mental maps in the design of expressive clothing.
2. Measuring the impact of the use of electronic mental maps in the development of creative thinking of students in the design of expressive clothing.
3. To highlight the role played by mental mapping strategy in the educational situation in opening the door for students so that they can recognize and express their creativity.

1.5 Research Importance

The importance of the research appears in the following:

1. The results of the research may contribute to the benefit of designers of design courses in the design of courses and other units using mental maps.
2. Keep abreast of recent developments in the field of teaching strategies and the required development and acquisition of inspiration skills in fashion design.
3. The current research may contribute to raising the level of skill in the students as well as the measurement of their attitudes towards learning using mental maps and this is consistent with the vision of Kingdom of Saudi Arabia 2030, which calls for the development and modernization of education.

1.6 Definition of the Terms

Mind map: It is an effective mental approach and a quick method that helps the student or the learner from one side and the teacher from the other side in the good organization of knowledge building skills and adding new knowledge to each of them. it draws a map to expand the thinking of the subject of the study by segmenting it and adding new data and information to what is in the mind and works to reduce and abbreviate the words used in the presentation of the subject or lesson where it uses logic, short words, lines, illustrations, images, colors, and Link graphics(hilal.2007). The term in psychology also refers to information captured in the mind of the organism in which activities can be planned and pathways determined (Johnston, Pratt, Geraldine, 2009).

Electronic Mind Map: It is one of the strategies of active learning and active tools in strengthening memory and retrieving information and generating new creative ideas that are unfamiliar where It works the

same way as the human mind which helps to activate and use of the two parts of brain and arrange information in a way that helps the mind to read and remember information instead of conventional linear thinking to study problems and develop strategies in a non-linear way and is prepared through computer programs.(Abd – Alrraziq, 2017).

2.Research Methodology

The research followed the semi-experimental approach using a single-set design (tribal / post) with the aim of identifying the impact of the independent variable (use of mental maps) on the dependent variable (creative thinking of female students).

2.1 The research sample

The sample of the study included (9) students of the master's program (Fashion Design) in the Department of Clothing and Textiles, Faculty of Home Economics, King Abdul Aziz University, who are studying the course (design expressive clothes).

2.2 The research tools

A scale of the creative pre/post performance of female students

2.3 The research limits

-Objective limits: including a tribal measurement of the performance of creative students in the design of expressive clothing by evaluating the projects that the students designed without using the method of the mental map, and measuring the performance of the creative students by evaluating the projects that the students designed using the mental map in order to measure the extent to which innovation has been achieved in designs based on the design of the mental map.

Human Limits: It consists of a group of students of the master's program in the major of (Fashion Design), in the department of Clothing and Textiles, Faculty of Home Economics, King Abdul Aziz University, who are studying a course (designing expressive clothing).

Through the application of the experimental Study for the research, the research questions were answered as follows:

Results relating to the first question, which states "What is the possibility of using electronic mental maps in the design of expressive clothing"?.

Creativity is not a genetic trait, so any person can develop his creative ability if he understands and realizes the truth of creativity (Hilal, 1997). There should be a way to learn how to do the technical experiment with a set of actions that will help the experiment succeed, including the method of drawing the mental map (Pozan: 2007).

The following steps have been followed to conduct the research experiment using the mental map in expressive fashion design.

First: Determine the sample of the experiment:

The sample of the experiment was selected from a group of (9) female students from the master's degree program in the major of (Fashion Design) in the Department of Clothing and Textiles, Faculty of Home Economics, King Abdul Aziz University, who are studying the (design of expressive clothes), as a sample for research to apply the method of drawing the mental map in the design of expressive clothes.

Second: Experimental Study:

It relied on a number of stages, as follows:

A . Explanation and clarification of the Concept of mental map:

The map was first defined, Its importance, how it was drawn, and the difference between the traditional and electronic mental maps, With providing a ready-made templates for mental maps so that students could map their own minds later. As follows:

Mind mapping patterns:

Mental maps are classified into two types as follows

First type: Traditional mental maps that use the paper and pen and it start drawing a circle representing the idea or the main subject and then draw from it sections of the main ideas related which are related to this subject and write on each branch only one word to express it and it can be placed symbolic images on each branch represents the meaning, as well as the use of different colors of different branches and each branch of the main branches can be subdivided into sub-branches representing the main ideas also for this section, similarly write one word on each sub-branch represents its meaning, colors and images can also be used, and continue to bifurcation in this map with the writing of a descriptive word and the use of colors and images to be in the end is a tree-like shape or map reflect the idea in all its aspects. The mapping procedure depends on a set of steps to be applied as follows:

- Select a shape as an icon for the main idea in the center of the map in the middle because the picture is

better for stimulating brain creative abilities.

- Use colors throughout the mapping because colors stimulate creative thinking and help distinguish areas of creative thought as well as stimulate visual centers in the brain and attract the attention of the eyes.

--Connecting the main branches in the central form by connecting the branches of the second and third levels to the second and first branches, because the brain works in a self-connecting way. If the branches connect to the paper, the thoughts will connect in the brain, and generate more creative ideas, and It also strengthens the main structure in the same way as the it is used by the bone structure, muscles and connective tissue to make the body coherent.

- Branches should take curved lines instead of straight lines Because the brain is attracted more to curved lines.

- Using one word per line Because each single word or single image generates a large variety of creative ideas while sentences and phrases tend to restrain that effect.

- Use graphics in the map layout because it makes it easier to remember images and symbols, and it stimulates new mental connections. (Poznan: 2007).

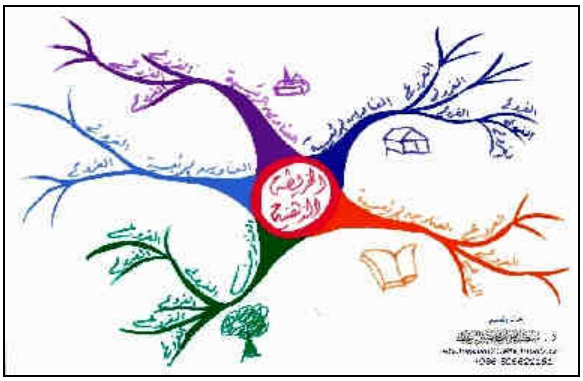


Figure (1) the general shape of the traditional mental map

http://emag.mans.edu.eg/index.php?sessionID=25&page=news&task=show&id=25,(17/07/2017)

Second type: Electronic mental maps, which depend on its design on a computer programs such as (MindManager8, FreeMind9, MindView3, I Mind Map), these programs do not require the user to have graphical skills because they automatically create maps with the flow curves of the branches, and allows to drag and drop images from the graphics library and adds new capabilities of the mental map, including the following:

- The arrangement of information in the subject with the possibility of expansion or folding in its branches, and this makes storing information much more than the traditional mental maps and can therefore be used to create advanced knowledge models that could not be created through the paper and pen.

-Embedding documents in the map, making links, memos and other data inside the map, and converting them To the equivalent of a powerful visual database, meaning that the map contains a wealth of rich information stored in an Excel word, document, spreadsheet, web page, or even email All this can be accessed by simply pressing it, saving time as well as avoiding visual chaos by making sub-maps and linking them together in a single controllable map.

- Reorder themes and ideas by moving some icons and this is difficult in traditional maps, which helps to generate new ideas and see links between existing ideas.

- Updating the contents of the map as needed making it a powerful tool for tracking and progressing constantly and thus can develop the current map so that it becomes another new map and so on.

- Export existing ideas in the map to other types of programs such as word processing, allowing the use of mental maps creatively.

- Provide the opportunity for cooperative work and this is not provided by traditional mental maps where it is possible to create an electronic mental map and send it by e-mail to others in the collaborative work team to make a common workspace and complete the rest of the map where it can be modified and several people can also work on the map at the same time.

- Updating mental maps after converting them into a presentation with comments from the beneficiary

public, which helps to contribute to the dissemination of ideas.

-Present ideas through brainstorming sessions using projectors and this is done by recording ideas with others' ideas and displaying them at the same time.

- The creation of a special information panel and the consolidation of data that we need to manage and organize in a single visual screen.

-Flexibility, where mental maps programs can create a database of ideas and create lists of tasks and track their progress as well as business planning and can be used in education and other areas.

- The advantages of electronic mental maps are the ability to integrate with other programs,the ability to edit easily, and the map size is not limited, and the possibility of presenting ideas during brainstorming sessions, and the possibility of working collaboratively at the same time (Real Time Collaboration).

The use of electronic mental maps in education has many advantages, including:

1. Make learning more enjoyable.
2. The main theme (focus of attention) crystallized in a central image.
3. Help to generate ideas and design a complex structure of knowledge, when starting drawing and setting all aspects.
4. The subject in the map is surprised the learner of the amount of ideas that flow on him because he deals with his mind in a similar way to his work.
5. It worked to connect complex ideas and helps learner integrate new knowledge with previous knowledge.
6. It managed to put everything that goes on in the mind of the learner and all the ideas of the subject in one sheet.
7. Develop the memory of the learner and increase his concentration.
8. Helps the learner to use the entire brain energy.
9. Radiant thinking: Since the human mind does not think like a computer, that is, in the form of straight lines, long and consecutive, but thinks in a glowing and radiant way, each word or image are at the same time an idea and center of other ideas.

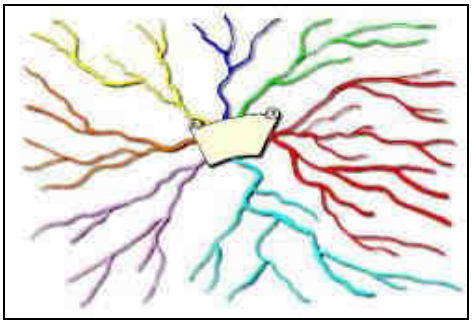


Figure (2) The general shape of the electronic mental map

http://emag.mans.edu.eg/index.php?sessionID=25&page=news&task=show&id= 25

B. Drawing the mental map:

Each student was asked to determine the basic idea she chose to express them through the design of expressive clothing and to use one of the mental mapping programs In order to draw a specific mental map within 60 minutes and visualize the process of thinking about the subject of the project and translate these ideas later in the creation of designs for expressive clothes so that the mental map includes the formative elements, which can be a source of inspiration for them in their design ideas as well as the color scheme on which their project will be based.

C. Evaluation

After 60 minutes, students were asked to stop working and relax for a while, and then each student returned to her own mental map and evaluated her design thought because the evaluation processes were essential processes in creative activity through which the creator will test his work and taste it in a critical way through which he sees how successful he is in achieving his goals and evaluations. It can be done before the actual start of implementation of the designs in order to test the quality of images and ideas that will be included in the work, if the concepts and ideas were relatively clear from the beginning, these processes may take place again after the actual implementation of the designs, and in progress from one step to the other in terms of ideas, shapes, colors, spaces, shadows or overall composition, the assessment is individual at the beginning, so every student evaluates her work and then opens a panel discussion to evaluate the ideas afterwards evaluate ideas afterwards.

D. Amendment

Each student makes small or minor changes or transfers in some or all components of the idea. There is a significant interaction between the assessment and modification processes, which may go together. However, adjustments are often preceded by a work calendar and then other corrections are made for the amendments that have occurred and so on until the student reaches the state of crystallization of the idea and satisfaction with the design idea, Thus, the drawing of the mental map is completed and each student begins using the map to implement her design ideas. It was noted that the application of the method of drawing the mental map had an effective result in the stage of preparation for the design and what it contains of quick Sketch Layouts as it facilitated the planning process for the students' making the process of implementing the design idea and introducing innovative and unfamiliar ideas is easy.

E. Implementation process

Where each student begin to develop her design ideas that reflect the basic idea in the light of the ideas that have been put in several sections in the mental map, which serves as a source of inspiration from which the student acquires her ideas and plastic elements In the designs of (line - shape - color - spaces – texture).

F. Evaluation and Amendment

After each stage, Students stop to reconsider their design ideas and re-evaluate them through self-criticism, collective criticism and then stability on the form of modifications that can be added And then implement them, Thus, the student finishes her design vision and implement them based on a drawing of the mental map.

3. Building the research tool and verifying its validity and reliability

As there are no fixed or standardized scales used in evaluating the creative abilities of female students in the field of fashion design in general and the design of expressive clothing in particular, the researcher has designed a scale for estimating of creative performance.

So as to measure the creative aspects and elements and foundations of design in the designs implemented by students without the use of mental maps (pre/application), and the other group of the executed designs by the same students, but using the method of mental mapping (post/application). It was taken into account in the experience the reliability of the study sample of the students so that it is the same subject of the student in the tribal and remote experience and the number of designs is the same in the two applications, so that through the calculation of average arbitrators' estimates, we can identify the degree of change in the students' creative ability after learning the method of designing the electronic mental map in the design. It also took into account the reliability of the arbitrators in order to ascertain the hypothesis if the use of mental maps had any positive effect on the design process for female students or not.

Description of the Creative Performance scale:

The scale consists of the basic dimensions on which creativity depends on the design of expressive fashion, namely (3) main axes, each of which contains a set of items which are "Fluency (3) - Flexibility (4) - Originality (5)" the grade of each student is assessed by three arbitrators using a five-point scale (Very available "4", available "3", somewhat available "2", not available "1", not available at all "0") The degree of the student on the scale represents the sum of the paragraphs that reflect the answer, great scale degree was (48 degrees) and the minimum (zero degrees). The researcher used the total score of the three arbitrators on each dimension as shown in the following table:

Table (1): the total score of the three arbitrators on each dimension in the scale

Component	Number of Vocabulary	The highest score for the three arbitrators	The lowest score for the three arbitrators
Fluency	3	36	0
Flexibility	4	48	0
Authenticity	5	60	0
(As a whole)	12	144	0

Content validity of the Creative Performance scale: arbitrators' validity:

In order to verify the content validity of the scale, it was presented in its preliminary form to a group of arbitrators from the specialization professors. Their number was (8), in order to judge the appropriateness of each term for its axis, as well as the wording of the terms and the identification and addition of any proposed expressions. The amendment was made based on the opinion of the arbitrators as follows, the addition of some new statements to amend the general form of the scale, to become the final version of the application, and the coefficient of agreement between the arbitrators was calculated on the scale items as shown in the following table:

Table (2): coefficient of agreement of specialists on the provisions of the measure of creative performance

Arbitration items	Number of times agreed	Number of disagreements	Coefficient of agreement
Suitable verbal formula for the vocabulary of the scale	8	0	%100
Fit the scale items to evaluate the student's creative performance	7	1	%87.5
The ability of the scale to evaluate the creative performance of the student In the use of the electronic mental mapping method in the design	7	1	%87.5

The researcher used the method of agreement of specialists their number was (8) in calculating the reliability of the observers to determine the arbitration clauses that are implemented provided that each of them recorded his observations independently of the other, the number of times of agreement between observers was determined using the Cooper equation: The ratio of the agreement = (number of times of agreement / (number of times of agreement + number of times of disagreement) × 100, and the proportion of agreement ranged from (87.5%, 100%), which are high ratios of agreement.

Validity using internal consistency between the total degree of each axis and the total score of the scale:

The validity was calculated using internal consistency by calculating the correlation coefficient (Pearson correlation coefficient) between the total score of each axis and the total score of the scale. The following table shows this:

Table (3): The values of correlation coefficients between the degree of each axis and the degree of the scale

Axes	Linking
Fluency	****0.95**
Flexibility	****0.94**
Authenticity	****0.92**

***Significant at level 0.01*

It is clear from the above table that correlation coefficients are all significant at the level of (0.01). Thus, it is possible to say that there is an internal consistency between the axes that make up this scale. It also measures what is already set to measure, indicating the validity and homogeneity of the scale axes.

Reliability of the measure of creative performance

Reliability was calculated by Alpha Cronbach coefficient.

Table (4): reliability coefficient values for scale axles

Axes	Alpha coefficient
Fluency	**0.941
Flexibility	**0.921
Authenticity	**0.932
Stability of the scale as a whole	**0.931

*Significant at level 0.01 **

The above table shows that all values of the Alpha Cronbach coefficient, are significant at the level of (0.01) indicating the reliability of the scale.

Calculation of the time of Creative Performance scale:

The researcher evaluated the time of the scale in the light of the observations, and monitored the performance of the students in the experimental experiment by calculating the average total times by the total time for all students on the number of female students. The time of the measure reached (20) minutes.

Calculate the ease and difficulty coefficients of the creative performance measure vocabulary.

The ease and difficulty coefficients of the scale were calculated and were found to range between (0.21 and 0.82) and were interpreted as not very easy or very difficult.

Calculation of the coefficient of discrimination for the items of the creative performance scale

Calculation of the coefficient of discrimination for the scale ranged from (0.19 and 0.82) and thus the scale vocabulary is considered to have an appropriate ability to discriminate.

Setting a creative performance scale in its final image of the application.

After the calculation of the statistical transactions, the scale became final so that it included (12 items), the maximum degree of the scale was (as a whole) (36) thus the scale became valid and ready for application in its final form.

4. Results of the experimental study

1- The second question was answered, which states "What is the impact of the use of electronic mental maps in the development of creative thinking of students in the design of expressive clothing?"

Through the application of study tools in the tribal / remote experience of research and conduct statistical treatments and validation of the hypothesis of research and draw and discuss the results as follows.

A tribal study was conducted to measure the extent to which innovation has been achieved in the designs that the students designed without using the electronic mental map method, and Remote study for the group of designs implemented by the students using the mental map to measure the extent to which innovation has been achieved in designs based on the method of drawing the mental map, and the extent of suitability for the application In the book design expressive clothing. The results of the Tribal / Remote Experiment were presented to three arbitrators of the faculty members in the field of fashion design to evaluate them according to the creative performance scale.

And to validate the research hypothesis which states: "There is a statistically significant difference at the level ($a< 0.05$) between the average scores of students in the experimental group in the tribal and remote applications on the scale of creative performance (as a whole) and each component of its components (fluency, flexibility, originality).

The researcher calculated the average and standard deviations of the scores of the experimental group students in the tribal and Remote applications on the scale of creative performance (as a whole)) and each component of its components (fluency, flexibility, originality).and the following table summarizes these results.

Table (5): standard deviations of the grades of the experimental group students in the pre/post applications on the scale of creative performance (as a whole) and each component of its components (fluency, flexibility, originality)

Component	Performance type	Average	standard deviation
Fluency	Tribal	12.22	4.55
	Posttest	31.44	5.39
Flexibility	Tribal	14.89	5.04
	Posttest	41.89	4.76
Authenticity	Tribal	12.22	4.58
	Posttest	54.11	6.25
Creative Performance Benchmark (as a whole(	Tribal	39.33	12.93
	Posttest	127.44	15.65

It is clear from the results summarized in the previous table that there is an improvement in the performance of female Students of the experimental group beyond and this is evidenced by the results of comparison of averages and standard deviations for the pre/post performance of students.

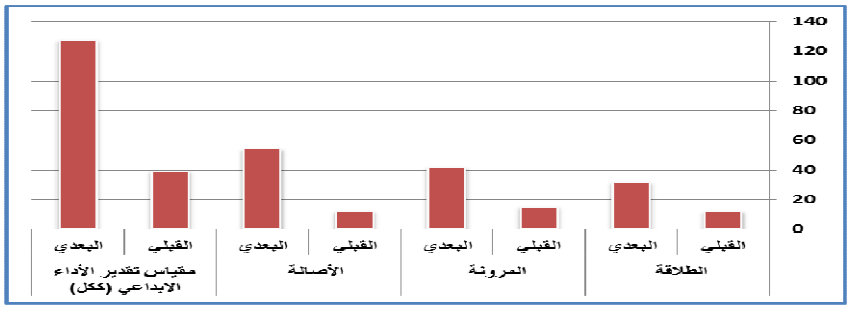


Figure (3): The averages of the grades of the experimental group students in the tribal and Posttest applications on the scale of creative performance (as a whole) and each component of its components.

As Wilcoxon Signed Rank Test was applied which is called a reference grade test and is a non-parametric test which is used as an alternative to the test (T) for the two associated data samples In the event that conditions are not met of use Test (T) for the associated values due to the small size of the sample. The following table summarizes these results.

Table (6) The value of "z" and its statistical significance for the difference between the average grades of the students of the experimental group in the tribal and posttest applications on the scale of creative performance (as a whole) and each component of its components.

Component	ranks of the signals	Average grade	Total grade	statistical "z"	Level of significance	Co-correlation coefficient (magnitude of effect = rprb(
Fluency	Negative	.00	.00	2.668	significance at 0.05	1.00 The effect is very strong
	Positive	5.00	45.00			
Flexibility	Negative	.00	.00	2.677	significance at 0.05	1.00 The effect is very strong
	Positive	5.00	45.00			
Authenticity	Negative	.00	.00	2.668	significance at 0.05	1.00 The effect is very strong
	Positive	5.00	45.00			
Creative Performance Estimator (as a whole(	Negative	.00	.00	2.670	significance at 0.05	1.00 The effect is very strong
	Positive	5.00	45.00			

The results summarized in the previous table show that the statistical value of "z" is a function at (0.05), This indicates that there is a statistically significant difference between the average grades of the students of the experimental group in the tribal and posttest application on the scale of creative performance (as a whole) and each component of its components. (fluency, flexibility, originality), Thus, the researcher can accept the hypothesis, which states: There is a statistically significant difference at the level ($\alpha<0.05$) between the average grade levels of the Students of the experimental group in the tribal and posttest applications on the scale of creative performance (as a whole) and each component of its components (Fluency, flexibility, Originality) - in favor of telemetry.

The researcher can attribute the disparity in performance on the scale of creative performance (as a whole) to the impact of processing using the electronic mental maps in which the researcher used appropriate teaching methods to achieve the objectives of specific teaching positions, In which students move from teaching to another method, which was confirmed by several studies, including: the study of (Almasri, 2015) The students' use of mental maps in designing the design idea Has contributed to the release of all ideas and information in one sheet, Which greatly helped to arrange and organize technical data to reach a good and innovative design idea,

Although the result of the test shows that the difference between the average performance of the Students of the experimental group in the tribal and post-application a significant difference that is not due to chance, it does not tell us much about the power of the use of electronic mental maps and therefore we calculate the Matched-Pairs Rank biserial Co-correlation coefficient of associated pairs to determine the size of the independent variable effect on the dependent variable. It can be calculated from the equation.

$$r_{prb} = \frac{4(T1)}{n(n+1} - 1$$

The strength of the relationship when using the binary correlation coefficient of grade = 1.00, which means that 100% of the cases The variation in performance can be attributed to the impact of processing using electronic mental maps, May have a significant impact on the creative performance of female students in the design of expressive clothing (as a whole) And each component of its components

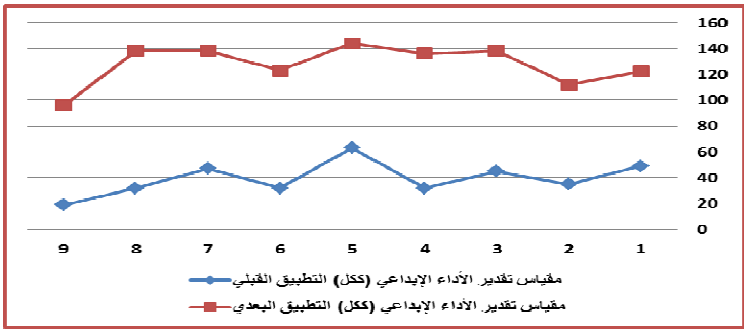


Figure (4) Performance of the experimental group's students in the tribal and post application on the scale of creative performance (as a whole)

The previous results have been confirmed by the study of (Spring and Abdul-Fattah, 2010) that mental maps have had an effective effect on the development of knowledge and skill, and it has outperformed the teaching method in the traditional way and the study of Hanafi (2015) which confirmed the results that the use of mental maps gives the designer a comprehensive picture and organization of the most important details, and it represents a method of high-minded methods of running the brain at the same time.

5.Models of students' work (post-application)

The following is a presentation of some models of electronic mental maps and the design ideas of female students, which were the result of the experience of using the method of drawing the mental map. Each student invented five design ideas Inspired by the idea of the mental map that she drew as follows (the students

were numbered instead of their names) (1: 10) so that it is easy to conduct and evaluate the experiment):

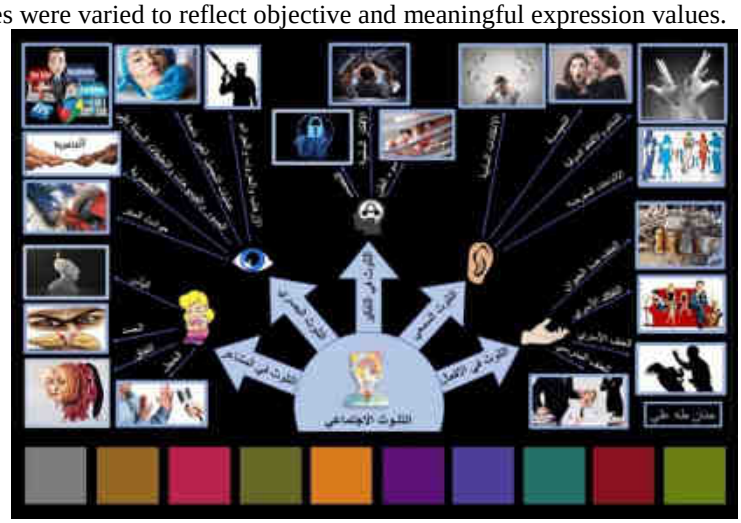
1. The first design idea (Student 1)

The concept of mental map is determined by the topic of social pollution. The student has defined the main subject in a central form, the main topics are divided into branches, And the branches branching into a structural formation related to the main subject, The key words of the study were also highlighted is a strong words and actions helps focus and ideas are put forward through them, Through the collection of images have specific meanings represent the ideas that revolve in the imagination of the student and relate or express the key words in the mental map.

Description of mental map: The mental map included the basic idea of social pollution and (5) branches which are:

- The first branch (visual pollution): It includes smaller branches around (images, videos and bad comments on social networking sites, traffic accidents, terrorism, wars and crimes, unsuccessful plastic surgery, racism).
- Second branch (audio pollution): It includes smaller branches about (negative criticism, gossip, insults and market words, malicious rumors).
- Third branch (pollution in thinking): It includes smaller branches about (intolerance, negative thoughts, mistrust).
- The fourth branch (pollution in feelings): It includes smaller branches about (hypocrisy (multiple faces), despair, envy, social shyness).
- Fifth branch (pollution in actions): Include smaller branches about (animal violence, family disintegration, family violence, school violence).

The color scheme selected in the mental map symbolizes the five types of social pollution (visual pollution, auditory pollution, pollution in thinking, pollution in emotions, and pollution in actions). Therefore, the selected color grades were varied to reflect objective and meaningful expression values.



Picture (1): The first mental map about (social pollution)

Suggested mental map designs:

Expressionism in design	Proposed Design
The design was based on the idea of intolerance, which is one of the types of pollution in the thinking expressed in the design by drawing locks in the head, which means the restrictive and fanatical ideas that lead to adherence to the acts, thus, it was expressed in the design in the form of chains around the body of the model restrict her movement and the status of the keys in her hand that when women open the locks on their ideas will be freed from the constraints, line and color element was adopted in the design, the dynamic rhythm in the movement of chains and restrictions was also used	**Design for pollution in thinking** 
The idea of design is based on hypocrisy, which is one of the types of pollution in the emotions and it was represented in the drawing of an alias face that the model removed from the face and different from the real face, it was also expressed in the drawing of many faces and multiple colors representing the multi-faces and characters in their personalities, and the design based on the element of the font and color and vacuum was also used from the foundations of the design of the rhythm of motion in the movement of faces randomly and represented artistic excitement in the form of faces and its color.	**Design for pollution in feelings** 

The idea of design was based on resisting negative criticism, which is one of the types of audio pollution. This was expressed by drawing a wooden color that expresses negative criticism, And that no matter how others tried to enter these negative criticism and frustrating words work permission to resist and fall in the form of crumbs on the uniform, which form a wonderful combination between the element of line and color, it also based on the foundations of design concentration and sovereignty at the top of the design and adopted the rhythm of motion in the movement of wooden splinters scattered on the uniform.	**Design for audio pollution** 
The idea of design is based on what is presented in social networking sites of inappropriate things that do not suit our society and values, which is one of the types of optical pollution in our time, so it was expressed in the design by drawing lines confused on the eye and spread in the form of a dress permeated by all the icons of social networking sites, and the design based on the use of the line element where the use of the lines of the random tortuous and it represents the rhythm of movement and the icons that permeate these lines give some kind of excitement.	**Design for visual pollution** 

The idea of design was based on animal violence, a form of pollution in actions where the design explained the use of animal skins in costumes and clothing supplements which shows the boast about the acquisition and wear of natural animal skins of some people and this leads to the death of these animals and extinction, and also using the line and color and the use of the foundations of design movement and artistic excitement were adopted in the design , this was achieved through the form of animal heads and movement as a group in one direction.	**Design for pollution in actions** 

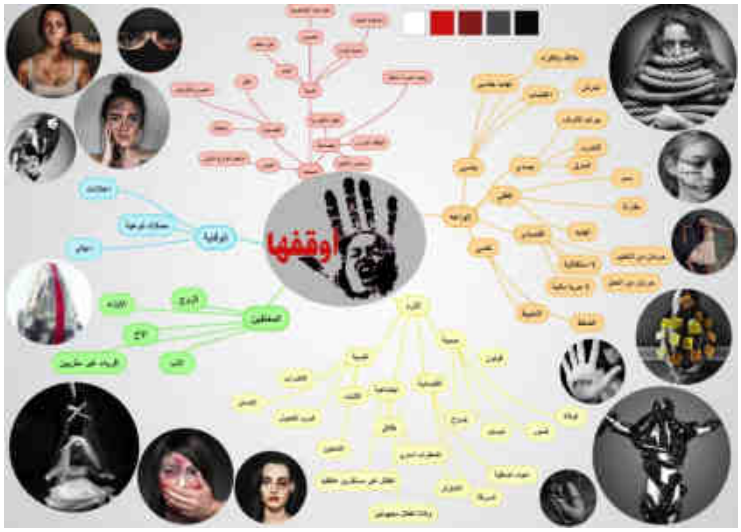
The second design idea (Student 2):

The concept of the mental map is determined by the subject of violence against women. The student has defined the main subject in a central form. The main topics are divided into branches; branches are divided into a structural structure related to the main subject, it also highlighted the key words of the subject of the study, which is a strong words and actions to help focus and ideas are put through it, by collecting images have specific meanings represent the ideas that revolve in the imagination of the student and linked or express the key words in the mental map.

Description of mental map: The mental map includes (the basic idea on violence against women and (5) branches:

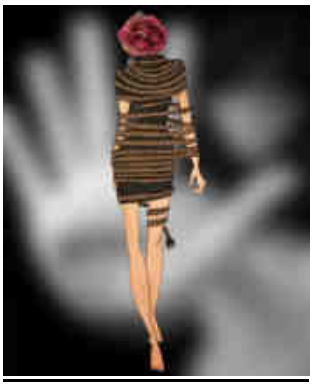
- First branch (types of violence): Include smaller bifurcation on (types of violence against women) and include smaller bifurcation on examples of each type.
- Second branch (causes of violence): Include smaller branches about (causes leading to women's abuse) and smaller branches include examples of each reason.
- Third branch (the effects of violence): Include smaller branches about (the effects of violence on women) and include smaller branches on examples of the effects that cause.
- Fourth branch (violators): Include smaller branches about (persons who practice violence against women.
- Fifth branch (Prevention of Violence): Include smaller branches on (Ways and Solutions to Prevent Increased Numbers on Violence against Women).

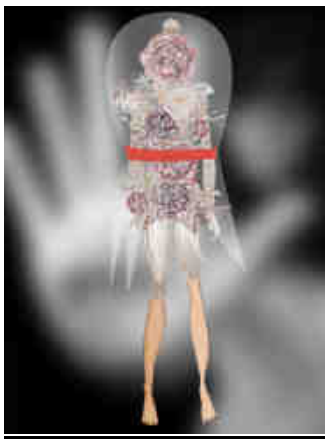
A black, gray, white, dark red and light color scheme is used. The black indicates the blackness that violence leaves in the woman and the degrees of light red to the rose that reminds us of women and femininity. The dark red indicates the color of blood left by physical and sexual violence, White refers to women's emotional purity before turning to blackness.



Picture (2): Second Mental Map on Violence against Women

Suggested mental map designs:

Expressionism in design	Proposed Design
The design was based on economic violence against women when the violator deprives her of her financial freedom. The student dealt with the axis of economic violence and specifically the deprivation of financial freedom and independence in the design of the costume consisting of a long rope wrapped on the body of the model, which limits the freedom of movement and used red roses as a face of the model and express the beauty of women, It also relied on contrasting colors between black and red.	**Design on economic violence against women** 
The design was based on economic violence against women when the violator deprives her of her right to complete her education and work and to force her to do housework that she created only for the home, in the design of the costume consisting of a large cage worn by the model as a bird imprisoned restricted and deprived of the exercise of the right to fly to please his owner, the student used red roses as a face of the model and body and express the beauty of women. The researcher also adopted the contrast in colors between black and red.	**Design on bereavement of education and employment** 

The design was based on the psychological violence practiced against women when the violator practiced pressure, threat, comparison and manipulation. The student dealt with psychological violence, specifically pressure to execute orders and depriving her of her right to express in the design of the costume consisting of plastic bag that encircles the model and was covered with red tape to indicate the tight closure and inability to express, the researcher used red roses as the face of the crossbar and the body and express the beauty of women. She also relied on the contrast in colors between black and red.	**Design on psychological violence** 
The design was based on physical violence against women when the violator practiced beatings, burning, sexual violence, rape, harassment, and sex by coercion. The researcher dealt with the axis of physical and sexual violence, and specifically the exploitation of the woman's body to practice violence against her in the design of the costume made up of the vast hands and the woman's body, which is a commodity can violence violently, the student used red roses as the face of the model and the body and express the beauty of women. It also relied on the contrast in colors between black and red.	**Design on physical violence** 
The design was based on violence in general when practiced by the husband on his wife under the umbrella of marriage. The student dealt with the axis of violence practiced by the husband to design the costume consisting of torn wedding dress and wedding scarves and some cords tied to the wife as a guide to the husband's control like a wooden doll of Marionette famous dolls that are controlled by the actor in the puppet theater. The student used the red roses as the face of the model and her body and expressed the beauty of the woman. It also relied on contrasting colors between black, red and white.	**Design about husband violence** 

The concept of mental map is determined by the topic of hope in breast cancer patients. The student has identified the main subject in a central picture. The main topics are divided into branches; branches are divided into a structural structure related to the main subject, it also highlighted the key words of the subject of the study, which are strong words and actions that help to focus and ideas are put through it, by collecting images have specific meanings represent the ideas that revolve in the imagination of the student and relate or express the key

words in the mental map.

Description of mental map: The mental map includes (the basic idea of hope in women with breast cancer and (5) branches:

- First branch (Clot): Include smaller branches about (mammogram, biopsy, and waiting).
- Second branch (sadness): Include smaller branches about (anxiety, fear of death).
- The third branch (diagnosis): Include smaller infestations about (disease, hospital, oncology, medical tests).
- The fourth branch (treatment): Include smaller doses about (chemotherapy, eradication, radiation therapy, hormonal therapy).
- Fifth Branch (Hope): It includes smaller branches about (comfort, happiness).
- Sixth branch (survival): it includes smaller branches about (victory, health, power).

The pink color of the breast cancer logo has been used as a basic color, the use of its various degrees and the mixing of other colors, such as black, white, gold and green.

Picture (3): The third mental map about hope in women with breast cancer

Suggested mental map designs:

Expressionism in design	Proposed Design
The design was based on the idea of acute angular angles that express the intensity of discomfort and fear of pain, as it came in the design as a prominent block abnormal and strange design and breast cancer is abnormal from the rest of the body cells and strange and suffocating, where the corner wraps around the neck and is suffocating and painful around the head and was disturbed by painful black thoughts and spread around the uniform in reference to the nature of proliferation and the adoption of asymmetry in the design, and the distribution of sharp angles gave rapid rhythm and movement of the eye across the design as a whole.	**A design that expresses the stage of disease detection** 

The design expressed sadness and anxiety through the shape of the cage, which inspired the design, surrounded by the barricade and imprisoned inside. The cancer patient feels that she is in a prison of feelings of anxiety and sadness. The design was based on the idea of the cage as it represents prison and imprisonment of the soul. The cage was the focus of design and its most important elements.	**Design about the stage of anxiety and sadness** 
The design was inspired by the hospital gown and its treatment. The cancer patient undergoes several different types of treatment, and the hospital is the most frequent place that she visits, through the design of the status of cancer patient in the treatment trip where the process of hair loss and debility and loss of breast, the design was inspired by the hospital gown and the shoe is the leather shoe that is worn in the operating rooms. The lines and the shape of the acute angles in this design are an expression of the cancer that is still accompanying the patient, but she challenge and insistence on its defeat, The design was a traumatic expression of the stage, because all that the patient feels at this stage is shocking and frightening and this expression is intended to be delivered through design. The main asymmetry in this design was the use of the texture element by multiplicity of contacts indicating the multiple conditions of the patient in this period.	**Design for the treatment stage** 
The design was based on the idea of the wings and the freedom and light it represents to the hope that is like the wings of the patient of breast cancer cling to it and fly with it above its pain and fear and sadness. The wings were used at the bottom of the design and the emphasis on the color element and make it glittering sparkling, and in the ear ring she used logo of breast cancer a pink rose and the design came in full symmetrical proportion of the expression of the equilibrium reached by the patient at this stage and the multitasking in the design between the cloth and feathers and strips and all touching the colors of joyful calm.	**Design about the stage of hope** 

The design was inspired by a bright, winged expression of survival, recovery and health. The glittering wings rose to the top, unlike the previous design, where the patient actually flew over her illness and pain and wrote for her to survive and triumph. The length of the hair was an expression of recovery and healing of the effects of treatment. The design was balanced with a dynamic rhythm by repeating the movement of inscriptions on the skirt, which added to the vitality of the design, and the use of the piece of jewelry inspired by the design as a complement to the dress.	**Design on the stage of survival** 

Research Recommendations

By presenting the results reached, the following recommendations were identified:

- The application of teaching using the mental maps to other courses that needs to acquire the skills of knowledge and skills to upgrade the teaching process.
- Research and focus on what is new in the educational process, especially the modern teaching strategies, and conducting similar research in clothing and textile courses.
- The creative process exists in every individual, and it is not limited to a selected few, so we have to find the modern teaching methods that will drive the students towards further innovation.
- Develop teacher development programs and develop the capacity of faculty members in educational institutions to include various approaches and strategies, including mental maps.

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