The Effect of Educational Infographics (Fixed / Mobile) Using (QR Code) Technology in Mobile Learning Environment on the Outcomes of the "Scouting Education and Its Applications" Course

Assist. Prof. Waleed Salah Aly El-Messawy

Assistant Professor, Department of Curricula and Teaching Methods of Physical Education and Sports – Faculty of Physical Education – Men – Alexandria University

Abstract

The current research aims to identify the effect of using educational infographics (fixed / mobile) using the (QR code), the quick response code in the mobile learning environment on achieving the outcomes of the "scouting education and its applications course" (cognitive – technical – emotional) for the credit hours students (second level) at the Faculty of Physical Education for Boys in Alexandria. The researcher used the experimental method for its relevance to the nature of the research using the experimental design with an experimental group, and also used the descriptive method in designing the scouting education course electronically using: infographics (fixed and mobile) with (QR code) technology, designing the electronic cognitive achievement test, criteria card for observing the applied scouting skills under research, and electronic attitudes scale. The study was conducted on a randomly selected sample of (45) students, which was divided into an experimental group of (30) students, and a pilot group of (15) students, in addition to (13) experts from the faculty members specializing in curricula and teaching methods, scouting education, educational technology and psychology. He also used the statistical treatments relevant to the nature of the research using the statistical packages software (SPSS). There was a clear superiority in the electronic cognitive achievement test and the applied tests of the applied scouting skills, in addition to the students' acquisition of positive attitudes towards studying the electronic scouting education course based on the infographics (fixed / mobile) for the experimental group. The researcher also recommends using the educational infographics in the mobile learning environment in order to acquire the learning outcomes of the academic courses.

Introduction:

Generally, infographics refers to the transformation of complex information and data into illustrated graphics in order to become easier to understand clearly and interestingly without the need to read a lot of texts, and this provides an effective visual communication between both the sender and the receiver, and it is also information designed not just for creating graphics since its main objective is to transform the complex information into simple information that is easy to explain using a colorful graphic language. The basic materials used are information and data by which collecting and processing them into visual symbols to understand and simplify the complex and large information and make it easy to understand, so we can use visual effects to communicate information and transform information and data from boring numbers and letters into interesting pictures and illustrations, and it is easy to publicize and spread infographics through social networks. (21:71)

Educational infographics is based on several elements, including visualizations that show complex information fast and clear by the integration of texts and graphics in order to show certain information about the skill the instructor wants to explain to the learner in his performance so that he can understand the skill more clearly, faster and easier. (17:22)

- Types of infographics: There are two types of infographics regarding form and design:

Fixed infographics: consists of images, graphics, arrows, main and subsidiary texts, links and shapes that are all displayed in one fixed form, whether in a main or horizontal form.

Mobile infographics: consists of images, graphics, arrows, main and subsidiary texts, links, and fixed and mobile shapes that are all displayed in one mobile form with high technology which produces the final form. (19:74)

QR Code technology has become one of the most common technologies recently, as it is used in all fields, and QR Code technology is an abbreviation for Quick Response Code. It is a technology that transforms data into special

encoding in the form of symbols and lines arranged digitally in a square image so that it can be read through a device dedicated to reading these codes or applications on smart phones dedicated to reading this type of code, as it decodes and converts the code into data. The QR code is the updated version of the barcode, and it has many uses, depending on the purpose of its use and the areas in which this technology can be used. Its uses cannot be limited to points, as it is used in libraries to encourage users to conduct their research, by facilitating access to information, which saves time and effort, and in the same context, it is used in the field of education for several purposes, for example, facilitating access to textbook references and follow-up the students' issues easier, in other words, you can see the QR in a lot of things that you find around you such as magazines, buses, signs, etc. where you can get information easily.

QR has advantages such as: the density and quantity of data contained in the QR – free to use for anyone – does not require creating data in a specific standard form – quick access to the included information – ease of reading the QR code – ease of printing the code on products, cards, clothes, gifts and others things.

In a related context, the opportunities to join scouting teams increased and developed in the intermediate, secondary and university stages, and many teams were formed. Scouting camps were established and other practices that help prepare the good citizen because of the importance of scouting education in refining and developing the scouts' talents towards himself and his community, and scouting activities are optional activities within the physical education curriculum, which the learner chooses when he believes he needs it to satisfy his inclinations and interests in it. They are also considered as global educational activities through which adults work to help young people and youth in developing their human personalities in a way that ensures comprehensiveness and balance at all behavioral levels.

Scouting education is one of the branches of education, as it integrates in its goals and practices with the goals of education, all of which seek to educate the individual in an integrated and comprehensive education. They found that scouting education is more important than other branches of education for several reasons, perhaps the most important of which are the following:

1- Scouting education and its educational activities are voluntary, motivated by self-practice, and are non-political, directed to junior and young people without discrimination in origin, gender or belief, according to the objectives and principles expressed by Baden Powell.

2- Scouting activities are concerned with acquiring knowledge and information, developing physical abilities and applied motor skills, and forming attitudes towards serving the environment and community development.

3- Training children and youth in the crafts and jobs they need, and accustoming them to self-reliance, cooperation with the group, strong observation, accurate attention, loyalty, validity, patience, courage, obedience, order, manners, and serving people anywhere in the world. (3: 7), (10:11-31)

Research problem:
The faculty's credit hours system has specified (2) hours per week for the "scouting education and its applications" course for the (second level) students including the application of its content (theoretical and practical). The course aims to educate junior and young people performatively, mentally, socially and spiritually, and train them in the various activities and crafts they need, as well as refining their talents so that each of them becomes a working element in the society, and a valid building block in building his country, and through teaching the "scouting education and its applications" course, some points that prevent the achievement of the course's objectives were identified, some of which are: using the method of explanation and presentation only during teaching, and the lack of diversity in using modern teaching methods and methods based on the use of technology, with the lack of educational and technical means for the theoretical and practical aspects, in addition to the lack of modern knowledge and information contained in the course and the content available in the textbook. In addition to the above, the Egyptian universities in general and Alexandria University in particular, recommended providing the teaching courses electronically through blended learning in many conferences, symposia, courses and studies, and encourage teaching staff to convert their courses into electronic courses, because the use of appropriate educational technology aims to achieve the best teaching and learning, also knowledge and information development are essential elements to achieve quality education, and the quality of education depends mainly on the quality of future instructors, all of which motivated the researcher to design a scouting education course using the educational infographics (fixed / mobile) with (QR code) technology as one of the technological media in the field of educational technology, through which it is possible to present the scientific content of the "scouting education and its applications" course through technological media based on new strategies for learning in application of the principle of uniqueness in education, self-learning and learning for mastery, in addition to watching models for camps, outdoor life and scouting activities directly.

The researcher also reviewed some previous studies which concerned with using multimedia and electronic software in the scouting education field such as:

Shafee Hassan (2007) (10) Gamal Salama and Sobhy Serag (2008) (7) Fatma Awad (2008) (14) Nicholas Diakopoulos et al (2011) (23) Jarwan Jamil (2014) (6), Hiwa Soliman (2014) (22) Fatma Awad and Walid Salah (2017) (15) who confirmed the notable efficiency of the uses of education technology in the scouting education field.

Research importance:
1- Shedding light on the uses of educational technology and its field application in the field of physical education, including the field of scouting education.

2- Improving the cognitive efficiency of the students with low and medium levels in the "scouting education and its applications" course.

3- Developing the students' performance competency in the applied scouting skills assigned to them.

4- Providing the students with positive attitudes towards educational infographics (fixed / mobile) using (QR code) technology.

Research objective:

1- Designing a "scouting education and its applications" course using the (fixed / mobile) educational infographics using the (QR code) technology.

2- Identifying the cognitive aspects that the students acquired from studying the "scouting education and its applications" course using the (fixed / mobile) educational infographics using the (QR code) technology.

3- Identifying the applied aspects that the students acquired from studying the "scouting education and its applications" course using the (fixed / mobile) educational infographics using the (QR code) technology.

4- Identifying the positive attitudes that the students acquired from studying the "scouting education and its applications" course using the (fixed / mobile) educational infographics using the (QR code) technology.

Research hypotheses:

1- There are statistically significant differences between the pre- and post-measurements in the cognitive achievement of the "scouting education and its applications" course in favor of the post-measurement.

2- There are statistically significant differences between the pre- and post-measurements in the applied skills of the "scouting education and its applications" course in favor of the post-measurement.

3- There are statistically significant differences for the post-measurement in acquiring positive attitudes towards the "scouting education and its applications" course.

Research terminology:

- **Educational infographics (fixed / mobile):** It is the transformation of data, information and complex concepts into images and graphics that can be clearly understood and recognized and they are presented in a smooth and clear way. (15:280)

- **QR code technology:** A technology that transforms data into a special encoding in the form of symbols and lines arranged digitally in a square image so that it can be read through a device dedicated to reading these codes or applications on smart phones that read this type of code as it decodes and converts it into data. (Procedural)

Scouting applied skills: (Procedural)

- **Directions:** readiness and orientation of the student towards learning the content of the scouting education course using the educational infographics (fixed / mobile) using the (QR code) technology. (Procedural)

Research procedures:

Methodology: The researcher used the experimental method with an experimental design using the pre- and post-measurements for one group, and the descriptive analytical approach was used in designing the scouting education course based on the educational infographics

(fixed / mobile) using (QR code) technology, and the electronic cognitive achievement test, the scouting applied skills observation card, and the electronic attitude scale were designed.

Human domain: experts and specialists in curricula, teaching methods, educational technology, sports psychology and aquatic sports and second-level students at the Faculty of Physical Education for Boys – Alexandria University.

Temporal domain: the second semester of the academic year (2021 / 2022).

Spatial domain: Faculty of Physical Education for Boys, Alexandria University.

Study population and sample: The original research population was represented by the second level students of the "scouting education and its applications" course within the credit-hour system, and they were (180) students. 45 students (25%) were randomly selected, and they were divided into (15) students for the pilot sample to conduct the scientific transactions, and (30) students for the experimental group. The researcher also got help of professors who are specialized in the fields of curricula, teaching methods, scouting education and educational technology, and they were (10) experts in total, attachment (1)

Statistical characterization of the research variables before the experiment:
Table (1) Descriptive Statistics of the research sample of variables before the experiment N =30

Statistical / Variables	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Cognitive achievement	24.00	37.00	29.00	3.12	0.93	1.13
Observation card	15.00	18.00	16.33	1.09	0.29	-1.17

Table No (1) for statistical characterization of the sample of variables under research prior to the experiment shows that the data for the total research sample are moderate and not dispersed. It is characterized by the natural distribution of the sample, where the values of the twisting factor range from (0.29 to 0.93) and these values are close to zero, confirming the moderation of the data for the research sample prior to the experiment.

- The pilot experiment and calculating the test reliability.

Third stage: preparing the final image for the tests:

The researcher also followed the scientific steps in order to reach the final form of the data collection tools of the research.

- Scientific transactions (validity - reliability) for the cognitive achievement test and the scouting applied skills observation card and the attitude scale:

1- Validity of the cognitive achievement tests, the scouting applied skills observation card, and the attitude scale:

The researcher verified the validity of the tests in two ways:

- **The validity of the judges:** this was done by presenting the tests to a group of experts in the specializations of curricula, teaching methods, educational technology, sports psychology and scouting education, and they were (13) experts, and the initial form of the tests, measurements and contents of the lectures based on the educational infographics (fixed / mobile), and the approval ranged between (80:100%), and the researcher satisfied the approval percentage (80%) or more, and thus the tests became valid and applicable. Attachments (3) (4) (5)

Data collection tools: the researcher designed:

I: the electronic cognitive achievement test. Attachment (3)
II: the scouting applied skills observation card. Attachment (4)
III: the electronic attitude scale. Attachment (5)

Steps to build and codify data collection methods and tools:

After the researcher had reviewed many previous studies and scientific references related to the research, he designed the research tests, in order to identify the amount of knowledge, information, skills and attitudes the students have during the course through the following scientific steps:

First stage: Planning and preparing the tests under research:

- Determining the purpose of the tests.
- Setting the test instructions.
- Determining the specification table for the cognitive achievement test.
- Developing a specifications table for the cognitive achievement test, as it clarified the nature of the test, the number of items, the type of test questions, and the targeted educational outcomes to be achieved. Attachment (2)

Second stage: setting the test:

- Verifying the validity of the tests.

- The validity of the peripheral comparison: the researcher calculated the validity through the peripheral comparison (the higher and lower quarters) to find the validity of the cognitive achievement test, the scouting applied skills observation card and the attitude scale on a sample of (15) students from the research population and from outside the main sample, and the tables (2), (3) and (4) show that:

Table (2) Find validity by comparing the higher quarters with the lower quarters in the Cognitive achievement n = 6

Variables	higher quarter n = 3		lower quarter n = 3		Differences	t	The validity
	Mean	**± St.D**	**Mean**	**± St.D**			
Cognitive achievement	35.33	3.06	24.67	0.58	10.67	5.94*	0.95

* value (T) (0.05) (2.78)

It is clear from table No (2) of differences between the higher quarters and the lower quarters in the total of the Cognitive achievement in question to find the validity, That there are statistically significant differences between the two groups, where the calculated value (T) was (5.94) and this value is greater than the table value (t) at the level (0.05) = (2.78) and the value of The validity (0.95), This confirms the ability of variables to measure what they have been designed for and their validity.

Table (3) Find validity by comparing the higher quarters with the lower quarters in the scale (observation card) n = 6

Variables	higher quarter n = 3		lower quarter n = 3		Differences	t	The validity
	Mean	**± St.D**	**Mean**	**± St.D**			
Observation card	15.33	0.58	12.33	0.58	3.00	6.36*	0.95

* value (T) (0.05) (2.78)

It is clear from table no(3) for differences between the higher quarters and the lower quarters in the scale (observation card) in question to find the The validity, That there are statistically significant differences between the two groups, where the calculated value (t) was (6.36) and this value is greater than the table value (t) at the level (0.05) = (2.78) The value of The validity was 0.95, confirming the ability of variables to measure what they were designed for and their validity.

Table (4) Find validity by comparing the higher quarters with the lower quarters in the total of the attitude scale n = 6

Variables	higher quarter n = 3		lower quarter n = 3		Differences	t	The validity
	Mean	± St.D	Mean	± St.D			
Total attitude scale	83.33	0.58	77.00	1.00	6.33	9.50*	0.98

* value (T) (0.05) (2.78)

It is clear from table No(4) of differences between the higher quarters and the lower quarters in the total of the attitude scale in question to find The validity, That there are statistically significant differences between the two groups, where the calculated value (T) was (9.50) and this value is greater than the table value (T) at the level (0.05) = (2.78) The value of The validity was 0.98, which confirms the ability of variables to measure what they were designed for and their excellence in validity.

- The reliability coefficient of the academic achievement test, the teaching skills observation card, and the attitude scale: the researcher conducted the reliability test for the cognitive achievement, scouting applied skills observation card and attitude scale through application, and re-application of tests and measures after (7) seven days on a sample of (15) students from the research population and outside the main sample under the same conditions of the first application and the tables (5), (6) and (7) show the correlation coefficient:

Table (5) The relationship between the Test and R-Test in the Cognitive achievement variable under consideration to find the Reliability (in the method of reapplying the test) n = 12

Statistical Variables	Test		R-Test		Correlation labs
	Mean	± St.D	Mean	± St.D	
Cognitive achievement	29.00	4.55	37.67	6.26	0.511

* value (r) (0.05) (0.553)

It is clear from table No (5) on the relationship between the Test and R-Test in the Cognitive achievement variable under consideration to find the Reliability, There is no A statistically significant relationship between the Test and R-Test in the knowledge variable, where was the Correlation labs value (r) (0.511) and these values are less than the table value (r) at the level (0.05) = (0.553)

Table (6) The relationship between the first application and the second application in the scale variable (observation card) under consideration to find the Reliability (in the method of reapplying the test) n = 12

Statistical Variables	Test		R-Test		Correlation labs
	Mean	± St.D	Mean	± St.D	
Observation card	14.17	1.27	16.33	1.15	0.207

* value (r) (0.05) (0.553)

It is clear from table No(6) of the relationship between Test and R-Test in the variable (observation card) in question to find the Reliability, There is no A statistically significant relationship between the Test and R-Test in the Observation card, where was the Correlation labs value (r) (0.207) and these values were less than the table value (r) at the level (0.05) = (0.553).

Table (7) The relationship between the first application and the second application in the total variable of the attitude scale in question to find the Reliability (in the method of reapplying the test) n = 12

Statistical Variables	Test		R-Test		Correlation labs
	Mean	± St.D	Mean	± St.D	
Total attitude scale	79.92	2.54	84.83	2.44	0.789*

* value (r) (0.05) (0.553)

It is clear from table No (7) of the relationship between the Test and R-Test in the total variable of the attitude scale in question to find the Reliability, There is A statistically significant relationship between the Test and R-Test in Total attitude scale, where was the Correlation labs value (r) (0.789) and these values are greater than the table value (r) at the level (0.05) = (0.553).

The researcher also extracted the internal consistency coefficient and Cronbach's alpha coefficient:

The Cronbach's Alpha total attitude scale table shows that the value of the Cronbach's Alpha coefficient was 0.715 and this value is greater than 0.70, indicating the reliability of the scale. Attachment (6)

The researcher also found the coefficient of ease and difficulty for the cognitive achievement test:

that the ease labs ranges from (0.25 - 1.00(The difficulty labs ranges from (0.00-0.75) and these values are acceptable for the ability of cognitive testing to distinguish between students as well as for different levels of students. Attachment(7)

- Designing lectures (theoretical / applied) using educational infographics (fixed / mobile):

After the researcher reviewed some models for designing the learning environment based on the educational infographics, using the educational platform with (QR code) (face-to-face learning / e-learning), in which the stages of design are similar and conform to each other, and a model for educational design was used (Krauss, 2012) (24) according to the design steps:
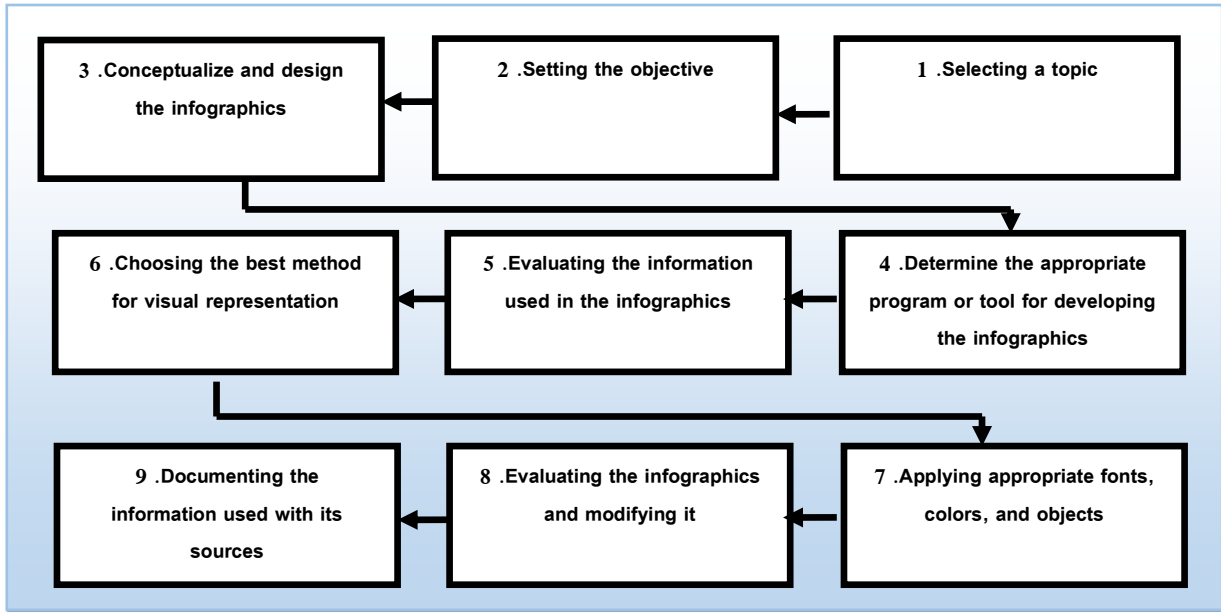
Figure (1) Steps of designing the educational infographics (fixed / mobile) in the "scouting education and its applications" course

The researcher has reviewed a set of applications through which infographics can be designed for professionals, such as: CorelDraw, Photoshop, InDesign, and Illustrator, but these applications require high design skills, and those who do not have high design skills can use the tools available online, since there is a wide range of free, low-cost online tools that can help designing infographics efficiently, (Stewart, 2019) (25)

4- Selecting the appropriate program or tool for developing and designing the educational infographic:

- Designing the content in the form of images, text and videos using QR code using appropriate colors
- Designing activities and distance learning tasks

1- Subject test: it was conducted to determine the scientific content (theoretical and applied) of the "scouting education and its applications" course, and to identify the main axes and topics that will be designed for the educational infographics (fixed / mobile).

2- Determining the general and procedural objectives of the educational content: the general objective is to design the education infographics (fixed / mobile) using QR technology in the mobile learning environment to improve the learning outcomes of the "scouting education and its applications" course

3- Developing a concept or a design for the infographics: Infographics design in a mobile learning environment:

Development stage of the infographics design:

The production stage, which consists of the following steps:

- Multimedia production of the educational infographics (fixed / mobile) in the mobile learning environment:

The images expressing information and knowledge, accompanied by an expressive image in one panel were selected after designing them through several applications, in addition to the common applications of creating infographics such as PowerPoint, Photoshop, and displaying them in the form of an educational board after printing them inside the scout camp and displaying the QR code via (Microsoft Teams) for the students to access it, and the images have been modified in order to take all technical and educational specifications in terms of color adjustment, or reducing or increasing the size into account.

- Designing the pages of educational infographics for the "scouting education and its applications" course:
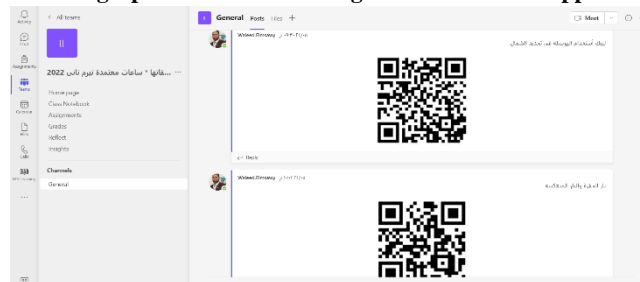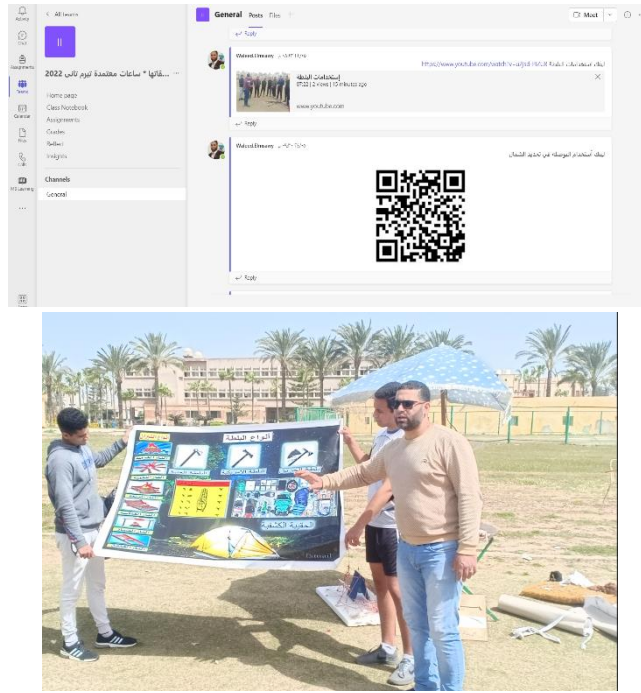
Figure (2) Designing the pages of theoretical / practical lectures using infographics via (Microsoft Teams)

Content production and educational activities: the content was developed in the form of explaining videos, and several criteria were taken into account when producing the content including: the high quality of the video files and their presentation through the QR code - small size video files - possibility to control video files
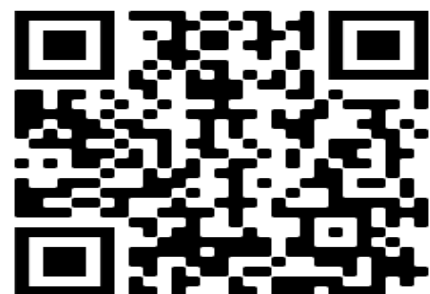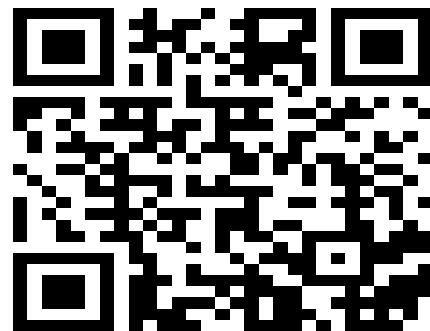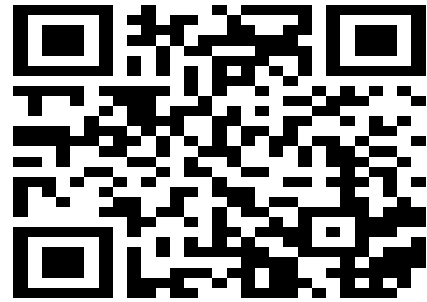
Figure (3) Designing the pages of application content using infographics with a QR code

and the various educational media, texts, images, and videos, have been integrated into online educational pages through the educational platform. The course has become available through the following link:

https://teams.microsoft.com/_#/school/conversations/%D8%B9%D8%A7%D9%85%D8%A9?threadId=19:c_FV9965xMaxhZT36x0Pi_qqzhcD66Opk8akgIrr_kE1@thread.tacv2&ctx=channel

- After completing the programming of the content and producing the educational infographics (fixed / mobile) and the tests under research via the Internet and after making sure of the technical examination of the content regarding the ease of downloading the QR code electronic scanner on different mobile devices and making sure that there are no technical problems, the researcher applied and implemented the infographics educational (fixed / mobile) in the mobile learning environment to achieve the targeted learning outcomes for the "scouting education and its applications" course.

Conducting surveys:

The researcher conducted pilot studies on a group of second-level students from the research population from outside the main study sample, and they were (15) students as follows:

- First pilot study: The researcher conducted the first pilot study in the period from 2/4/2022 to 4/4/2022 on a sample of (15) students, who are from the same research population and outside the main sample and it aimed at the following:

- Identifying the period required for conducting the cognitive achievement test, the observation card, and the electronic attitude scale

- Identifying the difficulties and obstacles that may encounter the researcher's work

- Second pilot study: The researcher conducted the second pilot study in the period from 9/4/2022 to 11/4/2022 on the same previous sample, with the aim of conducting the scientific transactions (validity and reliability).

Time of the main study:

The researcher applied the proposed model of the educational infographics (fixed / mobile) in the mobile learning environment on the educational platform via (Microsoft Teams) in the period from (16/4/2022 to 31/5/2022)

Evaluation stage:

The evaluation tools which included (electronic cognitive achievement test - scouting applied skills observation card - electronic attitude scale) were applied on the experimental research group before and after the evaluation.

5- Evaluating the information used in the infographics:

Presenting the course to specialists before the actual application in the field of educational technology, in order to comment on:

- The ease of browsing and navigating within the educational platform

- The size of the main and sub-menus texts

- Appropriate text size and clarity on the screen

- Appropriate stable animated educational boards

It has been presented to experts and judges in the field of educational technology after design. Attachment (8)

6- Selecting the best method for visual representation of the infographics:

That was done through the production of interfaces and interactive interfaces, provided that the interface is simple and easy to control, also one of the tools that the students have been trained on in Microsoft Teams, in addition to the appropriate visual effects for the nature of the presentation on the educational infographics.

7- Applying the appropriate fonts, colors, and objects: This was done taking into consideration:

- Conciseness in presenting the text

- Combining text and illustrations through QR code

- Linguistic integrity of the texts used

- Simplicity of the colors used

- Using an appropriate font size

- Placing icons as guidelines to clarify the concept

8- Evaluating the infographics, and modifying it:

After designing the infographics, it was presented to the judges for evaluation and modification of some details that might carry more than one meaning or visual interference during its presentation, assessment and evaluation tools were also produced by preparing the cognitive achievement test and the attitude scale in their electronic form, as the test and scale were converted from their paper form to electronic one using (Microsoft form) as follows:

A- Testing the learning environment for the educational infographics: the learning environment was tested by entering it using different devices (regarding the type, operating system, and screen size).

B- Monitoring the results on the various dependent variables.

C- Final adjustments: adjustments were made according to the results.

Programming the course content: The course content has been programmed using Microsoft PowerPoint, Adobe Flash,

Samples T Test -Percentage improvement - ETA Square - Ease labs- Difficulty labs-Chi-Square Cronbach's Alpha- Approval rate % - Sig. (2-tailed(.

* Statistical treatments:

Statistical treatments were performed using SPSS Version 25 at a confidence level (0.95) offset by a 0.05 (probability of error) indication level, which is as follows:

(Minimum- Maximum- Mean- Std. Deviation- Skewness- Kurtosis- T-Test (Paired Samples Statistics)- T Independent

Presentation and discussion of the results:

1- **View results for the Cognitive achievement**

Table (8) Statistical of the Cognitive achievement variable of the trial group before and after the experiment N = 30

Statistical Variables	Unit of measurement	Pre-measurement		post-measurement		Differences		t	Sig. (2-tailed)	Rate of improvement %	ETA Square
		Mean	± St.D	Mean	± St.D	Mean	± St.D				
Cognitive achievement	(degree)	29.00	3.12	43.67	2.87	14.67	3.85	20.85*	0.00	50.57%	0.94

* value (T) (0.05) (2.05)

*Effect size indication according to ETA Square * (low effect) less than 0.30* (average effect) from 0.30 to less than 0.50* (high effect) from 0.50 to 1

cognitive achievement, and also help shifting between the courses freely without being restricted to a specific place or time, by providing the course via the Internet, and thus: the student return to a certain part within the material at any time, which in turn helped the students of the experimental group to understand the different parts of the course, through what the educational infographics provided for the sufficient time factor during the presentation of the teaching content through the educational platform. The course, which led to the speed and flexibility of learning and acquiring information immediately, as well as holding discussions and inquiring about the electronic information content and its modules, and presenting data and information in a different way which enables the student to learn by himself according to his abilities, which had a great impact on the cognitive achievement of the "scouting education and its applications" course, and these results are consistent with the studies of Shafee Hassan (2007) (10) Gamal Salama, and Sobhy Serag (2008) (7) Fatma Awad (2008) (14) Jarwan Jamil (2014) (6) and Hiwa Soliman (2014) (22) Mohamed Hussein (2016) (16), Fatma Awad, Walid Salah (2017) (15) Heba Abdel-Hafez (2019) (21) Safinaz Hussein (2021)(11). The results of which confirmed the effectiveness of Multimedia in improving the cognitive achievement and presenting them in an electronic form.

Table No (8) of the statistical indications of the Cognitive achievement variable under consideration for the trial group before and after the experiment show that there are statistically significant differences at the level (0.05(Between pre- and distance measurements in favor of distance measurement in all variables under consideration, the calculated value (T) was (20.85) It is higher than the table value (t) at 0.05 (2.05), the improvement rate (50.57%) and the ETA Square value (0.94) is greater than (0.50), indicating the impact of the experimental variable of the experimental group. This is due to the teaching of the "scouting education and its applications" course, using the educational infographics (fixed / mobile), which had a great effect in providing a huge amount of knowledge and information in many forms, because each educational topic has (behavioral goals in the three areas – theoretical content – fixed and mobile images – educational videos – educational activity), where the educational infographics, in turn, works to create an educational environment that encourages scientific thinking, and one of its advantages is that it is able to provoke the student's thinking, and contributes to enhancing the educational process according to the desire, speed and ability of the student, and that the use of e-learning based on the using the Internet in education within faculties in an electronic way and the accompanying content presentation and clarity in front of the students, this also raise the level of the student's

2- View the results of the observation card scale

Table (9) Statistical of a variable (observation card scale) of the trial group before and after the experiment N=30

Statistical Variables	Unit of measurement	Pre-measurement		post-measurement		Differences		t	Sig. (2-tailed)	Rate of improvement %	ETA Square
		Mean	± St.D	Mean	± St.D	Mean	± St.D				
Observation card	(degree)	16.33	1.09	23.00	0.74	6.67	0.92	39.59*	0.00	40.82%	0.98

* value (T) (0.05) (2.05)

*Effect size indication according to ETA Square * (low effect) less than 0.30* (average effect) from 0.30 to less than 0.50* (high effect) from 0.50 to 1

information on the practical aspects of the course and forming a background or a mental conception of what the student will do in the live applied lectures and charting a path of development in acquiring the applied skills well, and the educational platform contained a number of links on the YouTube channel and educational videos on the implementation of scouting applied skills. In this context, Amira Taha (2008) (6) indicates that the application of modern technological methods has become a necessity in the current stage of university education, which needs modernization and renewal in all strategies. It is no longer sufficient for the professor to master his scientific topic only, but it has become necessary to have integrated competencies, capabilities and necessary skills and to be able to use the best means, methods and methods to present the topic effectively in order to conform to the students' needs, guidance, facilitating their participation and preserving their learning. These results are consistent with what I have explained, and these results are consistent with Jarwan Jamil (2014) (6), Hiwa Soliman (2014) (22), Mohamed Hussein (2016) (16), Heba Abdel-Hafez (2019) (21), Islam Abdel-Fattah (2021) (2), Shorooq El-Zankalony (2021) (9), and Safinaz Hussein (2021) (11) whose results confirmed the effectiveness of multimedia in developing applied skills in various sports activities and presenting them in electronic media.

Table No (9) for the statistical indications of the variable (observation card) under consideration for the trial group before and after the experiment show that there are statistically significant differences at the level (0.05(Between pre- and distance measurements in favor of distance measurement in all variables under consideration, the calculated value (T) was (39.59) It is higher than the table value (t) at 0.05 (2.05), the improvement rate (40.82%) and the the ETA Square value (0.98) is greater than (0.50), indicating the impact of the experimental variable of the experimental group. There was an improvement in the applied skills of the course because each educational topic contains behavioral objectives in the three areas – applied content – fixed and mobile images – educational videos – educational activity. The use of educational infographics (fixed / mobile) also contributed in providing the student with a great deal of feedback on the applied skills to be learned and applied, which positively had a positive effect on the level of scouting applied skills, and also contributed to taking into account individual differences between the students, as each student is allowed to proceed in the educational program according to his characteristics and mental abilities, and also contributed to making the student active and positive throughout the whole education period, and this in turn led to high levels of his applied competence, and the multimedia component of the infographics (images – videos – graphics – texts...) in creating a fruitful environment with resources and

2- View attitude scale results

Table (10) Frequency, Valid Percent, Chi-Square and approval rate for attitude gauge phrases for trial group N= 30

N	Statistical N	Yes		Kind of		No		Chi-Square	Weighted average	± St.D	Approval rate %	consequence
		F	%	F	%	F	%					
1	1	14	46.67%	15	50.00%	1	3.33%	12.20*	2.43	0.57	71.67%	21
2	2	20	66.67%	10	33.33%	0	0.00%	3.33	2.67	0.48	83.33%	9
3	3	10	33.33%	20	66.67%	0	0.00%	3.33	2.33	0.48	66.67%	24
4	4	20	66.67%	10	33.33%	0	0.00%	3.33	2.67	0.48	83.33%	10
5	5	21	70.00%	9	30.00%	0	0.00%	4.80	2.70	0.47	85.00%	4
6	6	3	10.00%	27	90.00%	0	0.00%	19.20*	2.10	0.31	55.00%	28
7	7	0	0.00%	29	96.67%	1	3.33%	26.13*	1.97	0.18	48.33%	31
8	8	9	30.00%	21	70.00%	0	0.00%	4.80	2.30	0.47	65.00%	25
9	9	11	36.67%	19	63.33%	0	0.00%	2.13	2.37	0.49	68.33%	23
10	10	22	73.33%	8	26.67%	0	0.00%	6.53*	1.27	0.45	13.33%	33
11	11	19	63.33%	11	36.67%	0	0.00%	2.13	2.63	0.49	81.67%	12
12	12	23	76.67%	7	23.33%	0	0.00%	8.53*	1.23	0.43	11.67%	35
13	13	21	70.00%	9	30.00%	0	0.00%	4.80	2.70	0.47	85.00%	5
14	14	2	6.67%	28	93.33%	0	0.00%	22.53*	2.07	0.25	53.33%	29
15	15	23	76.67%	7	23.33%	0	0.00%	8.53*	1.23	0.43	11.67%	36
16	16	8	26.67%	22	73.33%	0	0.00%	6.53*	2.27	0.45	63.33%	27
17	17	25	83.33%	5	16.67%	0	0.00%	13.33*	1.17	0.38	8.33%	37
18	18	22	73.33%	8	26.67%	0	0.00%	6.53*	1.27	0.45	13.33%	34
19	19	14	46.67%	16	53.33%	0	0.00%	0.13	2.47	0.51	73.33%	16
20	20	14	46.67%	16	53.33%	0	0.00%	0.13	2.47	0.51	73.33%	17
21	21	14	46.67%	16	53.33%	0	0.00%	0.13	2.47	0.51	73.33%	18
22	22	19	63.33%	11	36.67%	0	0.00%	2.13	2.63	0.49	81.67%	13
23	23	21	70.00%	9	30.00%	0	0.00%	4.80	2.70	0.47	85.00%	6
24	24	22	73.33%	8	26.67%	0	0.00%	6.53*	2.73	0.45	86.67%	2
25	25	21	70.00%	9	30.00%	0	0.00%	4.80	2.70	0.47	85.00%	7
26	26	22	73.33%	8	26.67%	0	0.00%	6.53*	2.73	0.45	86.67%	3
27	27	26	86.67%	4	13.33%	0	0.00%	16.13*	2.87	0.35	93.33%	1
28	28	0	0.00%	30	100.00%	0	0.00%	——	2.00	0.00	50.00%	30
29	29	21	70.00%	9	30.00%	0	0.00%	4.80	1.30	0.47	15.00%	32
30	30	14	46.67%	16	53.33%	0	0.00%	0.13	2.47	0.51	73.33%	19
31	31	14	46.67%	16	53.33%	0	0.00%	0.13	2.47	0.51	73.33%	20
32	32	16	53.33%	14	46.67%	0	0.00%	0.13	2.53	0.51	76.67%	15
33	33	12	40.00%	18	60.00%	0	0.00%	1.20	2.40	0.50	70.00%	22
34	34	19	63.33%	9	30.00%	2	6.67%	14.60*	2.57	0.63	78.33%	14
35	35	21	70.00%	9	30.00%	0	0.00%	4.80	2.70	0.47	85.00%	8
36	36	11	36.67%	17	56.67%	2	6.67%	11.40*	2.30	0.60	65.00%	26
37	37	20	66.67%	10	33.33%	0	0.00%	3.33	2.67	0.48	83.33%	11

* value (Chi-Square) (0.05) (5.99)

outdoors with its different types such as (ropes – tents – tiles – maps – codes – flags – evenings...), all of this was behind the growth of the positive attitude towards using educational infographics (fixed / mobile) in improving the students' attitudes towards teaching the "scouting education and its applications" course electronically. Using the images, videos and advanced technological texts such as the live view of the camps during camping and what they contain from the scout unity club, and the presence of the instructor with the learners in the learning environment is a process of great importance in the immediate correction of the mistakes made by the students, and this is due to using the educational infographics that provides a fertile environment of the learning resources that

Table No (10) for statistical Frequency, Valid Percent, Chi-Square and approval rate for Attitude scale for the trial group shows statistically significant differences in most phrases, where the calculated value of the Chi-Square was greater than the table value (Kay box) at the level (0.05) = (5.99) Approval rates for all phrases ranged from 8.33% to 93.33%. This improvement is due to the fact that the students acquired some good attitudes, tendencies, desires and additional emotions from the scouting education course and its electronic applications, and this result is explained by using electronic media through educational infographics and on the information network such as fixed and mobile images, graphics, sound effects and some models of scout units, camps and tools used

provide students with a huge number of applications supported by technological multimedia relevant to their needs, desires and tendencies during learning and as one of the attitudes of self-learning focused on the learner, because of the positive impact on the learners, in addition to the interesting presentation of the program, which helped the students to learn, and allowed them to freely view the information and repeat watching, hearing, and commenting on it more than once according to their desire, speed and ability to learn, which led the students to feel themselves and the importance of their role in the educational process, which made the students acquire the information with a mental perception and a clear mental awareness of the information related to the contents of the course, also when the students use more than one sense the process of remembering gets improved during the performance and visualization of the information related to the performances, which prompted the students to do a mental activity for scientific thinking, and all of this undoubtedly provided a good opportunity for the members of the experimental group to learn and form an integrated knowledge background, and this affected a positive role on the emotional aspects of the students, and this is consistent with the results of the studies of Fatma Awad (2008) (14), Amany Shaaban (2009) (4), Jarwan Jamil (2014) (6), Hiwa Soliman (2014) (22), Mohamed Hussein (2016) (16), Fatma Awad and Walid Salah (2017) (15), Heba Abdel-Hafez (2019) (21), Shorouq El-Zankalony (2021) (9) and Safinaz Hussein (2021) (11) whose results confirmed the acquisition of positive attitudes towards the information network and e-learning.

Research conclusions:

1- There are statistically significant differences between the average scores of the pre- and post-measurements for the experimental group in favor of the post-measurement, which reflect the clear effect of the educational infographics (fixed / mobile) in improving the level of cognitive achievement.

2- There are statistically significant differences between the average scores of the pre- and post-measurements for the experimental group in favor of the post-measurement in the scouting applied skills observation card, which reflect the effect of applying the educational infographics (fixed / mobile) in developing the applied scouting skills for the students of the experimental group.

3- There are statistically significant differences between the pre- and post-measurements of the attitudes scale towards the electronically flipped learning strategy, which reflect the clear effect of the strategy in attracting the students' attention to the educational infographics (fixed / mobile) and the important role in the educational process.

4- Infographics has a positive effect on the development and improvement of the three aspects of learning (cognitive – technical – attitudes) by improving the quality of the mobile learning environment and making it a fruitful interactive environment.

5- Infographics has a positive effect on the three aspects of learning (cognitive – technical – attitudes) by addressing the learning senses (visual – auditory – tactile) of the learners.

6- Infographics has a positive effect on the learning environment by providing a variety of learning resources that meet the interests, tendencies, desires and needs of the learners.

7- The educational infographic was one of the appropriate tools and media with the nature of the research variables and the scientific content to be delivered to the learners.

Research recommendations:

1- Using educational infographics (fixed and mobile) in teaching similar educational courses.

2- Training the personnel of the educational process, including the teaching staff members and the assisting staff, on the use of modern technologies in teaching all university courses, and the using the educational infographics (fixed / mobile) in the teaching courses.

3- Conducting further research on the educational infographics and its different styles.

4- Conducting further research to identify the impact of the educational infographics (fixed and mobile) in the mobile learning environment on the learning outcomes of the courses and maximizing the benefit from it.

References:

I- Arabic references:

1	Ahmed Hussein Sallam	20 05	:	Developing a Curriculum for Scouting Education and Scouting Preparation for the Students of the Faculties of Physical Education in the Arab Republic of Egypt. Unpublished PhD thesis, Faculty of Physical Education, Suez Canal University
2	Islam Raafat Abdel-Fattah Shahba	20 21	:	The Effect of Using Infographics on Learning Some Ball Skills in Rhythmic Artistic Exercises, The Scientific Journal of Physical Education and Sports Science (No. 92), Part (2), May
3	World Scout Bureau	20 09	:	The Constitution and the Internal Laws of the World Organization of the Scout Movement, translated by the Arab Region
4	Amany Shaaban Abdel-Latif Almaz	20 09	:	The Effect of an Educational Program for Some Computer Scouting Skills for the Students of the Faculty of Physical Education, Minia University. Unpublished PhD thesis, Faculty of Physical Education, Minia University
5	Amira Mahmoud Taha	20 08	:	Availability of Technological Competencies among the Faculty Members and the Extent of Their Practice of Such Competencies from their Perspective, Journal of Psychological and Educational Research, third issue, Menoufia University, Cairo
6	Jarwan Jamil Hamid	20 14	:	The Effect of Using Multimedia on the Cognitive and Technical Achievement of Some Units of the Scouting Education Course for the Students of the Sports

				Institute in Iraq. Unpublished Master's thesis, Faculty of Physical Education for Boys, Alexandria University
7	Gamal Ahmed Salama and Sobhy Mohamed Serag	20 08	:	The Effectiveness of a Computer Application on Learning Some Scouting Skills and the Cognitive Achievement for Outdoor Recreation for the Students of the Faculty of Physical Education, Kafr El-Sheikh University
8	Reham Hassan Aly Ahmed	20 03	:	A Proposed Curriculum for Scouting Education at the Faculty of Physical Education for Girls, Alexandria. Unpublished Master's thesis, Faculty of Physical Education for Girls, Alexandria University
9	Shorooq Moustafa Kamel Abdel-Hamid El-Zankalony	20 21	:	The Effectiveness of Using Educational Infographics Feedback on the Learning Curves of the Transmission Skill for the Female Students of the Faculty of Physical Education for Girls. Unpublished PhD thesis at the Faculty of Physical Education for Girls.
1 0	Shafee Shaaban Hassan	20 07	:	Designing a Multimedia System and Its Impact on the Acquisition of Some Areas of Scouting Activities for the Learners at the Second Cycle of Basic Education. Unpublished Master's thesis, Faculty of Physical Education, Alexandria University.
1 1	Safinaz Moustafa Hussein	20 21	:	The Effectiveness of an Educational Program Based on Infographics on the Cognitive Achievement and the Level of Technical Performance in Some Track and Field Events for the Preparatory Stage Students, Scientific Journal of Sciences and Arts, Faculty of Physical Education for Girls, Helwan

				University, Volume 061, Issue 061, pp. 91-110, Spring
1 2	Sobhy Mohamed Serag, Hala Mohamed Omar	20 05	:	Outdoor Recreational Awareness for the Field Training Students at the Faculty of Physical Education, Tanta University as a Basis for Developing an Outdoor Recreational Program. Research published in the World of Education magazine, No. 17
1 3	Amr Mohamed Ahmed Darwish, Amany Ahmed Mohamed Eid El-Dakhny	20 15	:	The Two Infographics Patterns of Presentation (Fixed and Mobile) via the Web and Their Impact on Developing Visual Thinking among Autistic Children and Their Attitudes Towards Educational Technology, Volume 25, Issue 2
1 4	Fatma Awad Saber	20 08	:	A Proposed Program of Professional Development for the Distance Physical Education Instructors in the Field of Scouting Education, the Fourth Regional Conference of the International Council for Health, Physical Education, Recreation and Kinetic Expression in the Middle East, Research Published in Theories and Applications, Faculty of Physical Education for Boys, Alexandria University
1 5	Fatma Awad Saber, Walid Salah Aly	20 17	:	The Effectiveness of Education/E-Learning in Teaching the Scouting Education Course on Cognitive Achievement and the Tendencies of the Teacher/Student at the Faculty of Physical Education for Boys. Research published in the Journal of Applied Sports Science, Faculty of Physical

				Education for Boys, Alexandria University
16	Mohamed Salem Hussein	2016	:	The Effectiveness of Using Infographics Technology on Learning the Technical Performance and Cognitive Achievement for the Long Jump Event. Published research, Scientific Journal of Physical Education and Sports Science, Faculty of Physical Education, Helwan University
18	Mohamed Shawky Shaltout	2016	:	Infographics from Planning to Production, Riyadh: King Fahd National Library, Bibliotheca Alexandrina
18	Mahmoud Ibrahim Abu El-Khair	2008	:	A Suggested Educational Curriculum for the Scouting Activity for the Preparatory Stage for Boys in Port Said. Unpublished Master's thesis, Faculty of Physical Education in Port Said, Suez Canal University
19	Mahmoud Tarek Haroun	2019	:	Modern Technologies for Educational Technology in the Digital Age (Augmented Reality - Infographics - Smart Boards), the Academy of Sciences, Cairo
20	Noureddine Eid Gomaa	2000	:	A Proposed Curriculum for Scouting Education for the Students of the Faculty of Physical Education for Boys in Cairo. Unpublished Master's thesis, Faculty of Physical Education for Boys, Helwan University, Cairo
21	Heba Saad Mohamed	2019	:	The Effectiveness of Using Infographics with Fixed and Moving Patterns on the Cognitive and Technical Achievement of the Front Somersault with Two Hands on the Jumping Table. Published research, Assiut Journal of the Sciences and Arts of Physical Education, Faculty of Physical Education, Assiut University

22	Hiwa Mohamed Aly Soliman	2014	:	The Effect of an Educational Scouting Program on Learning Some Outdoor Skills for the Students of the College of Basic Education at Sulaymaniyah University. Unpublished Master's thesis, Faculty of Physical Education for Boys, Alexandria University

II- Foreign references:

23	Diakopoulos, N. & Kivran-Swain, F . & Naaman, M.	2011	:	Playable Data: Characterizing the Design Space of Game-y Infographics. Proceedings from The Sigh Conference on Human Factors in Computing System. 1717-1726.
24	Krauss, J.	2012	:	Infographics: More than words can say. Learning & Leading with Technology, 39 (5), 10-14.
25	Stewart, C ,	2019	:	17 incredible tools for creating infographics. https://www.creativebloq.com/infographic/tools-2131971