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## Evaluating Maps and Illustrations in Geography Books for the Middle Stage

### Abstract

*This research aims to (evaluating maps and illustrations in geography books for the preparatory stage). In order to answer the research questions, the researchers prepared two tools, the first tool represented the quality standard of maps, while the second tool represented the standard of photographers, and the map tool in its final form consisted of (51) fifty-one indicators distributed on (13) thirteen basic elements of the map and a visual variable, either The graphic tool included (39) thirty-nine indicators distributed over (12) twelve criteria, and the validity was confirmed by presenting them to the arbitrators. Stability through time, stability between two analysts, so the reliability coefficient reached: for the researcher over time for the maps criterion (91%) and for the graphics criterion (93%), and the reliability coefficient between the researcher and the other analysts for the maps criterion (88%) and for the graphics criterion (90%). To analyze the data, the researcher used the statistical methods and means represented by: Cooper's equation to calculate the reliability coefficient, frequencies, arithmetic mean and standard deviation to find out the degree of availability of each indicator and each criterion. Most of them were low for these books. As for the pictorial ones (pictures and drawings), the percentage of verification in the fourth and fifth grade book was higher than what was achieved in the sixth grade book.*

**Keywords:** Pictures and Drawings, Sixth Grade Book, Visual Variable.

### Introduction to the Research

**Research Problem:** Maps and pictures have a role in influencing the cognitive, skill and emotional formation of learners, as they make learning more effective, and since geography is seen as maps and pictures of various natural and human phenomena, its evaluation to know its accuracy and clarity and the extent to which it includes the content of the subject expressed and its suitability to the mental age of students is necessary, as The maps and illustrations in geography books suffer from a clear weakness, and this was confirmed by the results of some studies. The study (Al-Moussawi, 2011) concluded that geography books in the preparatory stage suffer from insufficient maps, drawings and illustrations in the book. This is a shortcoming aspect and a negative factor in the book. (Al-Mousawi, 2011), and (Al-Jawari and Abdul-Mohammed, 2020) found that the maps and pictures in geography books lack diversity,

lack clarity, and are not suitable for the level of students, as well as their lack of modernity and lack of keeping pace with scientific development, and they do not motivate students. And do not bring their attention to its content. (Al-Jawari and Abdul-Mohammed, 2020), hence this study came as an attempt to shed light on the maps and illustrations of geography books, as no previous study (to the knowledge of the researcher) was conducted that dealt with maps and illustrations in geography books in Iraq. The problem of this research is to answer the following question: Are the standards of good maps and illustrations available in the geography books for the preparatory stage?.

**Research Importance:** Geography occupied an important position in every educational stage, especially the preparatory stage, as it helps students to glimpse the facts and realize the image of the environment in its multiple aspects and its different levels with a deeper understanding of relationships,

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explanation of phenomena and linking causes with results, and teaching geography allows for practicing different types of useful activities in their daily life, which it helps to achieve students' positivity and give them a lot of tendencies and experiences. (Mahmoud, 2006).

The preparatory stage is characterized by the fact that the students at this stage comprehend the abstract concepts to an increasing degree, as the concepts of the students at this stage approach the abstract levels, as well as the students tend to solve the problems they face, logical analysis and imposing their assumptions, and therefore the student's world in the preparatory stage is more regular and more Abstract If compared to the rest of the school stages, in addition to the regularity and abstraction of the intellectual world of the student in this stage, his ability to pay attention increases, and he can easily and easily absorb complex problems, as well as his ability to remember based on understanding increases as he remembers the information he understands and links it to his previous experiences, and suggests Piaget said that mental development during the early teenage years consisted largely of developing formal or systematic processes and increasing their accuracy, as he believed that middle school students are able to comprehend abstract concepts to a certain extent, while Brunner believes that students at this age learn to use the form The symbolic representation of facts or their expression in ways that are increasingly accurate and advanced. (Al-Demerdash, 1997).

The importance of maps and illustrations in geography books is increasing, as a result of changes and developments in the concept of school curricula, and changes in geography are one of the most important reasons for the increasing importance of visual aids, as they describe and clarify the content of textbooks and help in learning difficult and abstract concepts. Graphics help students receive content in different forms, and integrate topics into the student's mental model as compared to learning from the text alone. (Trahocsh, 2019). The main principles on which the constructivist learning model is based:

**Search Objective:** This research aims to evaluate maps and illustrations in geography books for the preparatory stage, by answering the following two questions:

**First:** Are the standards of good maps available in the geography books for the preparatory stage?

**Second:** Are the standards of good illustrations available in the geography books for the preparatory stage?

## **Search Limits**

### **This Search is Determined by**

1) Maps and illustrations of the book *The Foundations of Geography and its Techniques* for the fourth literary grade, which is scheduled to be taught in Iraq for the academic year (2020-2021 AD), authored by a committee in the Ministry of Education, the tenth / revised edition, 2018.

2) Maps and illustrations of the natural geography book for the fifth literary grade, which is scheduled to be taught in Iraq for the academic year (2020-2021 AD), authored by a committee in the Ministry of Education, tenth edition / revised, 2018.

3) Maps and illustrations of the human geography book for the sixth literary grade, which is scheduled to be taught in Iraq for the academic year (2020-2021), authored by a committee in the Ministry of Education, tenth / revised edition, 2018.

## **Define Terms**

### **1. Maps: He Defined It**

#### **Saadeh (1992)**

It is a schematic drawing representing the entire surface of the globe or part of it so that the relative size and location of that part is clarified, based on the use of a specific drawing scale for miniaturization and the adoption of a specific map projection from the known elevations, which helps to clarify the natural phenomena or the multiple human activities of the drawn geographical area. (Saada, 1992).

#### **The researcher knows it procedurally:**

They are the maps included in the geography books for the preparatory stage and prepared by the Iraqi Ministry of Education / Curriculum Development Department.

### **2. Female Photographers: He Knew Him**

#### **Shams El Din (2014)**

An accurate recording of the apparent shape of an object, so it discloses the shape and color of the body, and it can indicate the hardness or softness of a thing by using our sensory experience with things, and it chooses from reality and confirms it (Shamsuddin, 2014).

#### **The researcher knows it procedurally: It**

is a visual representation of geographical phenomena in the form of pictures and drawings included in the geography books for the preparatory stage and prepared by the Iraqi Ministry of Education / Curriculum Development Department.

## A Theoretical Framework and Previous Studies

### *Maps and Photographs*

**General principles for designing school book maps:** The design of maps is an important matter and includes the coordination and organization of the various elements of the map and the selection of their symbols appropriate for the stage prepared for it. Their details and symbols are correct, coordinated and elaborate and attract the student to read them. The aim of making book maps is to achieve scientific purposes and help students understand what they are reading. (The Bank, 1982), Textbook maps are considered effective visual materials in conveying a lot of concepts and information and are used to achieve specific goals and objectives. (Kazim and Jaber, 2007), and therefore the book maps must be selected and designed in a manner commensurate with the mental level of the students and the school stage, in addition to the need to pay attention to the appropriate colors for each map. (Al-Hassoun et al., 1985), As the function of designing textbooks maps is to effectively communicate the information contained in the map to the beneficiary, so this function should address all the factors and circumstances that affect it, such as the level of awareness that the beneficiary has of the map and his need for it, the purpose of its use and the degree of complexity in its contents, financial and technical capabilities and design costs. (The Bank, 1982).

### *Components Included in the Design of Textbooks Maps*

1. Title: The title of the map shows what it contains of information and the topic it deals with, and it is one of the basic components that must appear on the map and in a prominent place on it. (Ismail, 1996).

2. The key to the map or its guide: The key to the map or its guide is the appropriate guide for learners to reach the largest amount of information in the map. The key often refers to the method of lines used to represent roads and borders, and how the colors represent the gradual heights of surface phenomena or the depth of seas and oceans. (H.E., 1992).

3. Scale: In textbooks maps, the scale used is the comparative linear scale, which measures in miles and kilometers, as well as the relative scale. There are a number of considerations in setting the scale in textbook maps, including that the scale length is appropriate for the area of the map on the book's page. As for the place of placing the scale, it is placed on the right side from the top under the title, or in the left corner from the bottom, and it may be placed at the

bottom of the map under the frame. (Black, 1989).

4. Geographical Coordinates Network: Small-scale maps contain only geographic coordinates, medium-scale maps include geographic and squared coordinates, and large-scale maps contain squared coordinates only because their scale is free of deviations and errors. (Black, 1989).

5. Map frame: Most of the maps in textbooks are placed inside rectangular frames. These frames consist in their simplest form of one simple line, and may be drawn in the form of two or more parallel lines. It is taken into account that the distance between the two lines is suitable for writing the numbers of longitude and latitude, and sometimes the inner line of the frame is cut and the numbers are written through it, but the outer line must be continuous without any cuts. (Abu Radi, 1998).

6. The source of the map: the source of the map is the side from which the information on the map was derived. In the maps used in school books, the geographical topics established within the syllabus of the geography book are the ones that determine the topics and phenomena represented on the maps. (Rasheed, 2008).

7. Nomenclature of school textbooks maps: It is one of the factors that help learners to read them in addition to improving the aesthetics of the map, and both the processes of placing names and designing the map are of equal importance (Al-Sheikh, 1987).

8- Map direction: The north direction is mentioned in textbooks maps when geographical coordinates (latitude and longitude) do not appear. (Black, 1989).

9- Map location: It is an attempt to transfer and draw maps from the arc surface to the flat surface, and the location of the map is the organization of the grid of longitude and latitude in a specific way so that the map can be drawn on it (Satiha, 1977).

**Visual variables in textbooks maps:** The school book maps use symbols, colors and shapes to express the various geographical phenomena and to express the sizes, dimensions and densities of the different geographical phenomena. (Al-Shari'i, 2006), and this goal of the map is achieved by using the graphic language, which is a spatial symbolic language that expresses images in two or three dimensions through visual variables, i.e. the language of the graph, and this language has variables called visual variables and visual variables are specific characteristics of the graphic element the graphic is a symbol or a sign that gives meaning. The graphic language has three characteristics that can be exploited by the author of the map to help the map convey information to learners easily.

**These characteristics are:** It is a universal language that everyone should understand, regardless of their native language.

1. It is a spatial language that shows the spatial correlation of geographical phenomena on the map, which has two dimensions to the location of the phenomenon, and the third dimension is the gradation in the value of the phenomenon, It is a visual language, that is, it is perceived through sight. (Al-Zaydi, 1995).

In order to achieve communication and benefit between the map and the learner, it is necessary to choose the visual variables that express natural and human phenomena, as well as the selection of valid visual variables capable of transmitting ideas and information to learners and simplifying complex geographical information. The map represents the essence of this communication, as it includes content that includes facts and information in a symbolic way that indicates reality by certain standards and in proportion to the mental abilities of the learners and in line with their level of intellectual maturity and motivates them to learn. Therefore, this map must be formulated with a clear concept to help learners clearly understand the relationships. (Al-Shuwaili and Masoud, 2005) and each visual variable has a certain level of relationship between the elements or groups of geographical data to be represented in school textbook maps. These variables use various symbols to express each visual element, which are (points, linear, spatial), and these variables are linked with each other to form visual coordination among themselves to give the map clarity and perception. (Al-Zaydi, 1995).

**The concept and characteristics of educational photographers:** Photographers are visual representations by means of sculpting, drawing, representation or images, and it is one of the means of visual representation that may include one place or be exposed to certain details and particles, and sometimes the subject may be presented separated from the components surrounding it of different and undefined sizes, and the name of the photographers is called the figure Which has a meaning and a perception, and it is the reflection of something or an object on a smooth area, and it is a mental reproduction. In Lisan al-Arab, images are given according to their apparent meaning and the meaning of the reality of a thing, and its form according to the meaning of its attribute. In "Larousse the Great", it indicates an accurate invocation and representation of the subject, through feeling or through a tool such as painted pictures, and "Mohammed Gharafi" confirms that the visual images with sensory perception are in reality nothing but a reflection of the external world in the awareness of the perceptive self. The image is not a reference to something else, but rather the false presence of

what it contains itself. Robert sees it as a replica reproduction or a similar representation of an object or thing, and it is also a message without code, and the pictorial ones are characterized by the improvement of experiences and behaviors, and one of their characteristics is the effective advancement of the bridge between the tangible and the abstract in terms of its ability to transfer the subject from its concrete, concrete character to its field Abstract conceptual. (Katot, 2009).

### ***Characteristics and Conditions of Good Educational Photographers***

1. It should be well-defined and well-directed, containing all the elements of the subject in a way that avoids confusion for the viewer.

2. That the information be limited and far from overcrowding. (Al Club, 1986).

It contains aesthetic elements without compromising its cognitive content.

To be related to the educational situation and to the local learner's environment.

It should be of an appropriate size. (The Club, 1988).

3. It should be simple, clear and with one partial idea.

4. To clearly show human activity and the characteristics of the natural environment.

5. Taking into account modernity in the picture so that the latest developments or changes appear, whether at the human or natural level. (Al-Kilza and Mukhtar, 1987).

6. That its content is commensurate with the educational goal and the educational learning situation and with the intellectual and age level of the learners.

To be distinguished by scientific accuracy and technical characteristics in photography, such as colors, framing, and others.

Its data should be distinguished in a way that makes it expressive and valid for raising questions and stimulating classroom interactions.

7. Its ability to give a clear idea of the sizes of things and their subject and its inclusion of details within sufficient limits that do not result in the distraction of learners. (Qatawi, 2007).

### ***Second: Previous Studies***

1. The study of Janko and Knecht (Janko and Knecht, 2013).

(Visions in Geography books: Classifying species and evaluating their educational qualities), This study was conducted in the Czech Republic (Masaryk University - Brno), and the study aimed to determine the types of visuals that are presented in the current Czech geography books in the lower secondary stage,

and what educational qualities these visuals possess. The researchers used the descriptive approach to achieve the goals of the study. The research sample consisted of five books for the lower secondary stage of human geography books. As for the research tool, the researchers prepared a research tool to classify the visuals and evaluate their characteristics. I concluded: Pictures are the dominant visual types in geography books, while tables, graphs, and maps are less frequent compared to pictures, and textbooks contain a large number of visual elements that do not match the content, and that there are many visuals without Headings though labels are important to learners. (Janko, knecht, 2013).

2. Trahorsch study (Trahorsch, 2019).

(A comparative analysis of the quality of visual images in graphology books for ISCED levels 1 and 2 for education).

This study was conducted in the Czech Republic. This study aimed to evaluate the quality of the perception of geomorphology, hydrology and agriculture in the Czech Republic through maps, charts and photographs in geography books for the levels of education ISCED 1 and ISCED 2. The researcher used the descriptive analytical method to achieve the objectives of his study, and the study sample consisted of (15 Textbook) on regional Czech geography for the two levels ISCED 1 (textbooks for 10-year-old students) and ISCED 2 (textbooks for 14-year-old students). The research tool consisted of criteria for visual characteristics that affect the effectiveness of learning, and the tool consisted of two axes and (12 basic criteria). It concluded: There are slight differences in the quality of visualization of geographical phenomena according to individual criteria, there is a relatively weak relationship between visuals and content in geography books, there is a decrease in the criterion of attractiveness and innovation in the visuals of geographic books, a decrease in the quality of perception of geomorphological phenomena in geography books, and the inappropriate choice of methods Expression in maps and graphs. (Trahorsch, 2019).

### Research Methodology and Procedures

The researchers used the descriptive analytical method (content analysis method), as it is one of the most appropriate scientific research methods for this study.

**Research community and sample:** The population of this research consisted of maps and illustrations in the geography books for the preparatory stage, and they are scheduled to be taught in Iraq for the academic year (2020-2021 AD). 159 illustrated distributed over geography books as shown in Table (1).

**Table 1.**

*Research Sample*

Classroom	The number of his maps	number of female photographers
the fourth	2	28
Fifth	17	113
VI	6	18
Total	25	159

**Search tools:** Because there is no ready-made and appropriate tool for collecting data that is compatible with the objectives and purposes of this research, the researchers have prepared two tools to suit this research, a tool for evaluating the maps included in the preparatory books, and a tool for evaluating the illustrations, in a manner that suits the nature of the stage and the nature of the book for which the tool is prepared. The preparation of the two instruments went through the following procedures:

**1. Procedures for preparing the mapping tool:** To prepare a tool for evaluating the maps of geography books for the preparatory stage according to them, the researcher followed the following procedures.

Reviewing the educational standards for selecting and mapping the geographic curricula, which are prepared by the Survey Authority and approved by the Ministry of Education / General Directorate of Curricula.

2. Examining the specialized educational literature represented by geographical books specialized in maps, which dealt with the design, preparation and basics of maps, Benefiting from all of the above in determining the basic elements of the map and the visual variables that should be evaluated, and preparing an open questionnaire that included two fields, the first field: the elements of the map by (8 eight elements) and the second field: the visual variables by (5 five variables), and the researchers distributed them to Experts and specialists, After completing the open questionnaire and collecting information, the two researchers prepared a preliminary list of good map criteria - the list included two fields, the first field represented by the elements of the basic map by (8) eight elements and (33) thirty-three indicators, and the second field represented by visual variables by (5) Five variables (16) sixteen indicators, and a total of (49) forty-nine indicators distributed over (13) elements and variables, Presenting the list of criteria (in its initial form) to a group of arbitrators and specialists to be informed by their opinions and to be guided by their experiences in the extent to which the paragraphs belong to each field, and the extent of scientific and linguistic safety, and any other observations and suggestions they deem appropriate.

**Procedures for preparing the imager tool:** To prepare a tool for evaluating the illustrations of geography books for the preparatory stage according to which the researcher followed the following procedures:

Accessing books specialized in educational techniques, means and technology, and benefiting from their scientific content.

Reviewing the specialized educational literature represented by previous studies that were close to the current study.

Benefiting from all of the above in preparing a preliminary list of criteria for good female photographers, which was prepared for the researchers in a list that includes (42) forty-two indicators, distributed over (13) thirteen criteria.

Presenting the list of criteria (in its initial form) to arbitrators and specialists, to be informed of their opinions and to be guided by their experiences in the extent to which the paragraphs belong to the field, and the extent of linguistic and scientific integrity, and any other observations and suggestions they deem appropriate.

**Honesty:** The researchers presented the two lists of standards that they prepared to a group of professors and arbitrators, and in light of their opinions and observations, the researchers adopted the standards and indicators that obtained an agreement percentage (80%) as an indication of their validity, and neglected the standards and indicators that did not obtain an agreement rate.

Since the number of arbitrators has reached (20) twenty, from different disciplines, the researchers considered the criterion valid when it received (18) approval, which exceeds the percentage of agreement (80%). As for the maps criterion, the list consisted of (51) fifty-one indicators distributed in two fields, the first field (map elements) and the second field (visual variables). As for the visual variables, the list included in its final form (39) thirty-nine indicators distributed into (12) two Ten criteria within the field of photography, and Appendix (3) explains this.

**Applying the tool:** The current research tool is the two lists of criteria prepared by the researchers, which mean the set of specifications and conditions that should be met in the phenomenon under study. for this purpose.

**Analyze stability:** To ensure the objectivity of the tool, the researchers used two types of stability:

**1- Stability over time:** The two researchers completed the first analysis on (15/4/2021) for the two criteria (maps and illustrations), while the second analysis was on (6/5/2021), i.e., a time difference of (21) days for the same sample that the researchers adopted for the study at a rate of (100%). The stability

coefficient of the analysis over time for the maps standard was (91%) and the graphics standard (93%), using Cooper's equation.

**2- Consistency with other analysts:** To achieve this stability, the two researchers hired another analyst with specialization, and they provided him with lists of analysis for maps, pictorials and geography books for the preparatory stage, and they agreed on the rules and foundations of analysis followed, and the analysis included all the maps and illustrations in the geography books, which amounted to (25) maps and 159 photographers, and extracted The two researchers have the stability coefficient between them and the second analyzer using Cooper's equation, and Table (2) shows this.

**Table 2.**

*The values of the reliability coefficient between the researcher and the second analyst, and between her and herself*

T	Standards	The stability coefficient between the researcher and the second analyst	The coefficient of stability between the researcher and herself over time
1	Map quality standard	88 %	91 %
2	Photographer quality standard	90 %	93 %

## Research Results

This chapter includes a presentation and explanation of the results reached by the researchers, and since the questions of this research were in two parts because the researchers prepared two tools, we will discuss the presentation and interpretation of the results of the first tool for the three books, then we will discuss the presentation and interpretation of the results of the second tool, respectively.

**Section One: Standard Maps:** In this section, the researchers will present and discuss the results of the analysis of the first criterion, which is (the criterion of maps). This research aimed to achieve a question according to the criterion of maps, and this question is:

**The first question:** Are the standards of good maps in the geography books for the preparatory stage?

Looking at the results of the fourth grade literary book, the total relative importance (relative weight) of the checker for the quality

criterion of maps is (9.81%), which is less than the percentage (50%) that was approved, and this means that the map criterion was not achieved in the fourth grade book. The researchers attribute this to the lack of maps in this book. In addition, the maps of this book lacked many of the requirements of a model map suitable for the stage and for the content of the book as a whole. As for the fifth grade literary book, the relative importance (relative weight) of what is achieved in this book is (0), which is much lower than the approved percentage (50%). This book has deviated from the assumed standards significantly and clearly. As for the sixth grade book, the total relative importance (relative weight) of the achieved amounted to (7.84), which is less than the percentage (50%) that is supposed to be achieved. The book is about quality standards in a big and clear way.

**Section Two: Standard of Photographers:** In this section, the two researchers will present and discuss the results of the analysis for the second criterion, which is (the criterion of photographers). The current research aimed to achieve a question according to the criterion of images, and this question is:

**The second question:** Are the standards of good illustrations available in the geography books for the preparatory stage? Looking at the results of the fourth grade literary book, the total relative importance (relative weight) of the checked for the quality standard of pictorials was (46.16%), which is close to the approved percentage (50%), and the researcher attributes this to the fact that the fourth grade book has achieved (6) six Out of (12) criteria, which is a good percentage and indicates that the illustrators of this book fulfilled the assumed criteria. As for the fifth grade literary book, the total relative importance (relative weight) of the verifier of the quality standard of pictures was (84.62%), which is much higher than (50%) and this is due to the fact that the verified criteria reached (10) ten criteria out of (12). Standard This means that the standard for pictorial representation has been achieved in the fifth grade book. As for the sixth-grade literary book, the total relative importance (relative weight) of the verifier of the quality standard of the illustrations was (82.06%), which is much higher than the rate of (50%), and this is due to the fact that the verified in this book is (9) nine criteria out of (12) Standard This means that the standard for the quality of illustrations has been achieved in the sixth grade literary book.

## **Conclusions, Recommendations and Suggestions**

### **Conclusions**

In light of the research results, the researchers concluded the following:

1. The maps included in the middle school books clearly deviated from the quality standards of maps, and most of them were not achieved and were low for these books.

2. As for the pictures (pictures and drawings), the percentage of what was achieved in the fourth and fifth grade book was higher than what was achieved in the sixth grade book, and this indicates that the literary books of the fourth and fifth grade are better in terms of pictures and drawings than the sixth grade book.

### **Recommendations**

In light of the research results, the researchers recommend:

1. Strengthening cooperation between specialists in curricula and teaching methods and specialists in cartography and between institutions based on writing books to improve and develop the curricula of the preparatory stage, especially the aspects related to maps and illustrations, in which the standards of the current research have not been met.

2. Inviting the General Directorate of Curricula in the Iraqi Ministry of Education to take care of the maps and illustrations and select them according to the criteria used in the current research and to serve the educational process.

### **Suggestions**

In light of the research results and to complement its requirements.

### **The Researchers Suggest Conducting Research Aimed At**

1. Evaluating maps and illustrations in geography books for the different school stages to see the extent to which they include the criteria for good maps and illustrations.

2. Evaluating the extent to which teachers and teachers in the different academic levels use the maps and illustrations included in the geography books.

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