

# Effectiveness of a Social Learning Platform on Professional Development of Computer Teachers

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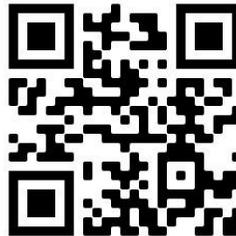
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## Effectiveness of a Social Learning Platform on Professional Development of Computer Teachers

### Abstract:

The aim of this study is to investigate the effectiveness of a social learning platform on the professional development of computer teachers at the preparatory stage of Al-Azhar Minia Directorate in the academic year 2021/2022. To achieve the objectives of the research, Study not researcher has followed the descriptive and semi-experimental methodologies. The research group consisted of (25) computer teachers, and the measurement tools were cognitive and practical test of (scratch) app. Experimental material included Virtual class, videos, PDF files, interactive activities, discussion forums has been created. Furthermore, the achievement test has been applied pre-learning and post-learning, and the post-learning observation card has been applied post learning. The results of the study showed the effectiveness of the social learning platform "Edmodo" in professional development through the development of software skills using "scratch" in both the cognitive and practical of computer teachers.

**Keywords:** Social learning platform, "Edmodo" platform, Scratch app.

## Introduction

Improving education and learning is one of countries' priorities, whether developing or developed countries. In view of the prevailing belief that this process is making a real contribution to the realization of these States' goals and hopes for the future, Teacher preparation is one of the most important factors helping to achieve the desired educational improvement leading to the progress of society in all its aspects. An efficient teacher is a teacher capable of effectively and perfectly achieving his community's educational goals.

Fatima Fathi's definitions (2022, 94), Kampen (2019, 2), Ahmed Mohammed (2015, 345), Tarek Abdulraouf (2011, 47) \* Professional Development is a long-term process from graduation to end-of-service, where human efforts and material potential are multiplied to improve teachers' performance in class, increase their professional growth in cognitive, skill and behavioral aspects, and develop their positive attitudes. Nasser Ahmed (2016, 759) asserts that the need for professional growth of the teacher is constantly present, since he/she cannot live his/her entire life with a specific set of skills and knowledge. Under the pressure of the tremendous advances of the present age, the teacher needs to maintain a renewed level of information and skills in his or her field of specialization. Therefore, Ahmed Abdul-Azim (2019, 71) describes the goals of professional development of the teacher as numerous and diverse including: addressing the various professional competencies a teacher lacks by developing all his/her academic, cultural and personal aspects.

Ahmed Abdel Azim (2019, 72), Awad Ali, Mohamed Habib, and Siddiq Mohammed (2017, 346) divided the fields of professional development of the teacher into several fields of study: first, the academic field, which is an important aspect for the teacher, for it includes the knowledge and skills related to the nature of its specialization. Second, the professional and educational field that aims at effective teaching in keeping with the latest developments of the age. Third, the cultural field that allows the teacher to open up to new cultural horizons, and the personal field that extends to modifying the

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\* The researcher follows (APA V.6) American Psychological Association, and starts with the first name of Arabic names.

teacher's behavior and giving him/her the values and trends that strengthen his/her personality. Fourth, the administrative field, which is the coordinator among all other fields, aims to make the teacher aware of all the administrative tasks surrounding his/her work.

Social learning platforms are an important e-learning technique that can be used to develop teachers' skills, being interactive and flexible technology tools that help deliver socially interactive learning that engages learners to improve their achievement levels. Besides, it provides teachers with cloud technologies and learning management applications with the ability to control the monitoring and performance of learners electronically (Nawal Ahmed, 2019, 32). Furthermore, Hikmat Ayesh, and Rannan Ali defined social learning platforms as "a social educational network that seeks to create communication between the teacher and the student in a virtual learning environment away from the traditional environment; and where parents can follow the achievement level of their students through this network." Anderson (2016) states that the use of social learning platforms in education is extremely important. They contribute to a flexible and safe environment for teaching and learning, help improve student performance and build skills, and expand their knowledge through the use of technology.

"Edmodo" is one of the most popular free social learning platforms that combine the benefits of "Facebook" and the "Blackboard" Learning Management System (Sameh Jamil, 2019:9). "Edmodo" has a set of tools that create an integrated social learning environment, including virtual classrooms and groups; news feed page, and a library for storing and saving files and presentations. Moreover, it enables users to communicate with each other through chat and answering questions through a discussion forum. Besides, it allows the instructor to create quizzes and homework assignments, easily evaluate them, and provide appropriate support and reinforcement to students. All these capabilities and tools support many theories, including social constructivist theory, communication theory, and behavioral theory.

**Statement of the problem:** The researcher identified the research problem through the following sources:

**First: Field observation:** Within the job of the researcher as a computer course supervisor at Mallawi Azhari Educational Administration, he noticed during his technical follow-up of teachers of Al-Azhar preparatory institutes a shortage in the skills of ready-made programming using "Scratch" for computer teachers, which are the skills prescribed in the computer curriculum for students in the first preparatory grade. This leads to the teacher being unable to teach these skills to pupils, and therefore need professional development programs to deal with this deficiency.

**Second- Exploratory study:** To find out the reliability of the research problem, the researcher conducted an exploratory study on 25 male and female teachers of computer at the preparatory stage in Minia Azahari Directorate. This has been represented in a Observation card to measure the extent to which computer teachers possess the skills of ready-made programming using "Scratch". The results of the study were as follow:

- 61.5% of teachers are unable to deal with the program interface screens and project platform background.
- 69.5% of teachers do not have the skills to work with project objects within the program.
- 88.9% of teachers do not have the skills to employ the various programming group commands found within the "Scratch".
- 92% of teachers do not have the skills to repeat object movements.

### **Third: Review of previous studies**

The results of Naser Ahmad's study (2016) indicated that among the reasons for the need for professional development of teachers is their low level of professional development. The results of the study of Mohamed Habib, Siddiq Mohamed and Ibrahim Othman (2018) asserted that the interest in professional development of teachers brings the integrated development of students, which is reflected in their knowledge and skills. Thus, the recommendations of Huda Yahya's study (2020) emphasized the necessity of determining the training needs necessary for the professional development of teachers before preparing training programs. Nevertheless, the researcher noted a paucity of studies that aimed at developing the skills of programming using "Scratch" by teachers, as a unit of study intended

for students in the first preparatory grade. Most studies, however, have been dedicated to developing these skills among the students themselves, including: Mohamed Al-Sayed (2019); Mahmoud Ibrahim, Yusuf Al-Sayyed and Iman Abdul Aziz (2019); Marianne Milad (2017); Magdi said & Mona Hassan (2017); Wael Samah (2015), while Omaima Kamel's study (2020) indicated that there was a shortage of professional development programs related to the skills of programming using "Scratch" with computer teachers.

**Statement of the problem, and the research questions:** As can be noticed above, the problem of research has been identified in the "low level of computer skills using Scratch" with both the cognitive side and performance for computer teachers at the preparatory stage, in "Minia Azhari Directorate".

**To be concluded, this study attempts to answer the following main question:**

**“What is the effectiveness of a social learning platform on the professional development of computer teachers by developing software skills using “scratch”?**

More specifically, the study attempted to answer the following questions:

- 1) What "Scratch" ready-to-use programming skills should be Gained by junior computer teachers in Minia Azhari Directorate?
- 2) How is experimental process material Should be built?
- 3) What is the effectiveness of a social learning platform for professional development of programming skills using "scratch" with its both sides of cognition and Skills in computer teachers?

**Objectives of the study:** Professional development of computer teachers in Minia Azhari Directorate through development of software skills using "Scratch" with its both sides of cognition and performance.

**Research hypotheses:**

- A social learning platform at a level of  $\geq 1.2$  is effective in developing knowledge related to software skills using "scratch" for computer teachers in Minia-Azahari Directorate by using Black's revised gain rate.
- There is a statistically significant difference at a level of  $\leq 0.05$  between the average performance score of the "Scratch"

Research Group for the RCF skills, and the test score that represents 85% of the total score for the observation card.

### **The significance of the study:**

- **Theoretical significance:** In response to the call of many educators and specialists for the use of technical innovations in the professional development of teachers.
- **Applied importance:**
  - To develop software programming skills using "Scratch" for computer teachers.
  - To focus officials' attention on investing social learning platforms in developing the teacher skills.
  - To direct the attention of the officials of the educational institutions of Al-Azhar Directorate to the teachers' need for professional development related to computer curriculums, especially software programming using "Scratch".

### **The experimental design of the study:**

This study uses a single-set experimental design that depends on comparing the results of the assessment of research group members before and after the use of the e- Social learning platform. The pre- test was applied first, then the research group was incorporated into the learning process, after that the post-test and observation card were applied dimensionally.

### **Search limitations:**

- A voluntary group of (25) male and female computer teachers of the preparatory stage in Minia Azhari Directorate.
- The objective limits were software skills using "Scratch", in which the opinions of the arbitrators were surveyed, which include the skills of (dealing with the Scratch interface, dealing with objects, using the commands of different software groups).
- Using "Edmodo" social platform to create professional development for computer teachers in software-based scripting using Scratch.
- The research experiment was implemented during the period from 1/8/2022 to 4/9/2022.
- The spatial boundaries were represented in the Internet.

### **Tools of the study:**

In this study, the researcher used the following tools:

- **Data collection tools:**

- **Observation card (scout study):** To be sure of the extent to which computer teachers have ready programming skills related to "Scratch".
- **Resolution to determine software skills** using "Scratch required to be developed for computer teachers in Minia Azhari Directorate.

- **Measurement tools:**

- Achievement test to measure the cognitive aspects of the software skills using Scratch.
- Observation card to measure skill aspects of the software skills using Scratch.

- **Experimental processing material:**

The "Edmodo" social platform has been used. It is a platform that offers a range of services including: Registration for teachers, students and parents with roles defined, virtual classes and groups, upload and share educational content in different formats, upload and share files, simultaneous and non-synchronous social communication and interaction tools. Besides, it provides a personal electronic file to document what is being done; and provides activities and e-tests with the ability to provide feedback. It has an application that can be used through mobile phones.

**Search variables:**

**First: The independent variable:** A social learning platform.

**Second: The dependent variable:** Professional development in terms of using the two sides of software skills (cognition-skills).

**Search terminology:**

In the light of the definitions contained in a number of educational literature related to the variables of research, taking into account the nature of the learning environment and the sample, and the tools for measuring research, it has been possible to define the research terminology procedurally as follows:

**Effectiveness:** the impact of an Edmodo social learning platform on the professional development of computer teachers, measured statistically using a modified gain rate and a level of significance.

**"Social Learning Platform":** An interactive learning environment that utilizes Web 2.0 technology and combines the advantages of e-

content management systems with social networks, with the aim of the professional development of computer teachers in Minia Azhari Directorate.

**"Professional Development"**: A process that aims to address the deficiencies of junior high school computer teachers by providing them with a set of knowledge and skills associated with software programming using "Scratch". It is measured by using a cognitive test and a Observation card.

### **Theoretical Framework of the Study:**

The theoretical framework consists of two sections, social learning platforms, and professional development.

#### **The first section: Social learning platforms**

- **Concept of social learning platforms:**

Hikmat Aish & Rannan Ali (2018: 41) defined social learning platforms as "a social education network that seeks to create communication between the teacher and students in a virtual learning environment away from the traditional environment. Moreover, parents can follow their students' level through this network". It is defined by Riyadh Abdul Rahman and Aisha Saleh (2017: 122) as "Internet-based services, which allow individuals to build personal or professional files, based on a system that is open or semi-open to the public; in order to help communicate and collaborate, or exchange information with their contacts or other users of the system, with whom they share contact lists".

From the above presentation, it is clear that social learning platforms are: A collection of sites that represent a virtual social education network, exchanging and sharing knowledge among members, and offering a variety of services such as interest, educational activities and opinions by adding personal versions, exchanging photos and videos, adding blogs, communicating with peers, and creating personal groups.

- **Importance of social learning platforms:**

Anderson (2016) reported that the American Association of Publishers (AAP) took a closer look at the experiences of some faculty members from California and Texas colleges in using social learning platforms, and agreed that the importance of social education

platforms is: to provide a flexible way to teach and learn, improve student performance, help students build and develop skills, and extend their knowledge through the use of technology.

- **The identity of "Edmodo" social platform:**

"Edmodo" is defined as a "Learning Network that provides teachers with tools to help them communicate with their students and parents. Teachers can share content, text, videos, homework assignments with their students via the platform" (Zakime, 2020). In addition, Sameh Jamil (2019) defined it as "a free educational social network that provides teachers and learners with a safe and easy-to-use learning environment through which teachers can exchange educational content, send and receive information, assignments and activities, and monitor and deliver grades. The advantages of the Facebook Network and the Blackboard Learning Management System are combined. From the previous definitions, it can be concluded that "Edmodo" is a system that combines the advantages of "Facebook" besides being a free social system that helps learners and teachers exchange content, practice activities, and perform tests. Moreover, it provides a secure learning community with different privacy and powers for members.

- **The advantages of using the "Edmodo" social platform in the educational process:**

The previous studies dealt with the advantages of using the "Edmodo" platform in the educational process, including: Badr Ghazi (2021:205); Nora Ahmed (2019: 123); Fauzual, (2019). These features about Edmodo can be explained in the following:

- It combines electronic content management systems and social networks.
- It helps students exchange views and ideas that help creative thinking.
- It enables teachers to create virtual classes for students.
- It helps organize academic life in an easy way, where all teachers and learners can access and subscribe to it for free.
- It conducts group discussions, send messages, and exchange files between teachers and students.
- It provides a digital library of learning resources for scientific content.

- It easily creates electronic tests.
- It has the ability to provide feedback to students.
- It can be uploaded to smartphones and tablets.
- It facilitates communication between teacher and parents, and informs parents about their children's results.
- It helps teachers monitor their students' performance of some skills and their progress.
- It supports interaction between teachers and learners.
- It allows students to recall what has been studied at any time.
- It gives shy students the opportunity to express and share their opinions.

The findings of Ibrahim Abdallah study (2019), which sought to explore the advantages of using the "Edmodo" platform in education, concluded that it was a closed and private learning environment, and that no one could join the class until he/she had the access code for the class, and that it was a transparent learning environment. There is no possibility for messages from unidentified persons.

- **The components of “Edmodo”:**

Several previous studies have dealt with the components of the Edmodo social platform, such as: Fatima Abdel Karim & Abdel Mahdi Ali (2021, 322); Ibrahim Abdallah (122:2019); Shirin Abdul Hafiz (2019, 274); and Youssef (2017), which can be summarized as follows:



**Figure (1), the components of Edmodo platform (prepared by the researcher)**  
**The second section: Professional Development.**

- **The definition of professional development:**

There are several definitions of professional development for teachers including: Jamal Ali & Hanaa Farghali (2021, 22) define it as "an organized, continuous and comprehensive process aimed at developing teachers' competencies in order to be more efficient and effective, to meet specific current or future needs of the community, the school, and the teachers themselves. This is to face the requirements of the profession and the developments and progressions that are taking place in this field". Samer Muhammad (239: 2019) defined professional development as "organized planning that enables the teacher to get improved in the educational profession by obtaining more cultural and behavioral experiences, and all that can improve the level of the teaching and learning processes. This training must have a predetermined plan or strategy and specific objectives". Moreover, Kampen (2019) defined it as "a kind of continuous learning effort for teachers, and one way in which teachers can improve their skills, thereby enhancing the results of their students".

From the previous definitions of professional development, it can be concluded that professional development is an ongoing process, carried out in accordance with a predetermined plan and specific objectives, in order to improve the level of the educational process, increase the teacher's productivity and renew the experience and knowledge of the teacher. In addition, it includes all the components of the teaching profession and aims at developing all the teacher's professional competencies.

- **Professional development objectives:**

The objectives of the professional development of teachers are as stated by Thani Hussein (2019, 33); Ahmed Abdul Azim (2019, 70); Osama Mohammed; and Abbas Helmi (2016, 304) in the following points:

- To keep up to date with developments in specialization and apply everything modern and new.
- To consolidate the principle of continuous learning, relying on self-learning methods.
- To keep up with developments in teaching and learning theories and working on their application for effective learning.
- To develop the skills of employing contemporary teaching techniques, and use them effectively in conveying information to the learner.

- To empower the teacher with the skills to use information sources and search for everything that is new and developed.
- To contribute to the formation of advanced learning communities that provide effective services to the society and address educational issues in a scientific and developed manner.
- To avoid deficiencies and shortcomings in teacher's preparation, enhance their performance and correct inactive pathways.

From the above mentioned presentation of teachers' professional development objectives, it is clear that addressing the deficiencies and lack of knowledge and skills related to specialization is a fundamental objective that has to receive attention from educational institutions.

- **The importance of professional development:**

Ronaldo & Harber (2008) assert that the professional development of teachers helps to achieve their own development by seeing all new in the educational process. Moreover, it meets the training needs of teachers, helps to bring about positive change in their direction towards the educational process. Eid Abu al-Maaty (2011) adds that teachers' professional development develops flexibility and adaptability in their working lives and contributes to reduced expenditures. In addition, the increased skills and competencies reduce the proportion of errors at work and contribute to keeping pace with changes and developments in the field of education. Furthermore, Seeto's study (2015) clarifies that teachers' professional development has a positive impact on the development of innovative and creative capacities of students. Thus, if the primary objective of the educational process is to raise the level of students' achievement, the primary responsibility for achieving this goal is on the teacher. Undoubtedly, this depends on the professional development of the teacher, because the relationship between the development of his/her skills and the achievement of his/her students is extraneous, as the professional development of teachers influences the orientation of educational institutions towards renewal and improvement in the educational process in order to raise the achievement of students (Fahim Abdul Maksoud, 2009:46). Hence, this shows the importance of teachers' professional development in contributing to the development of their performance, enhancing their efficiency and developing their different skills. This will be reflected at student

levels, increase their motivation towards learning, and develop their innovative and creative abilities.

- **Forms of professional development:**

After reviewing several previous literature and studies, the researcher has been able to identify various forms of professional development of teachers (Awad Ali, Mohammed Abdullah, 2017: 117); (Saleem Dewani, 2015). They are as follows:

- **Remedial professional development:** it is used when there is any shortcoming in teachers' performance, whether in personal, academic, administrative or educational terms.

- **Qualifying professional development:** It aims to qualify a new teacher or non-pedagogical teachers to perform their tasks properly.

- **Professional development of renewal:** Usually held periodically to familiarize teachers with educational theories and new knowledge in their field of specialization.

- **Professional Development for Promotion:** The expectant shall be held for promotion to managerial positions in order to familiarize them with the requirements of the new job.

As this study is concerned with the development of ready programming skills using "Scratch" which is to be taught to first-grade preparatory students, it falls under Remedial professional development.

- **Search Procedures:**

**1- Construction of experimental processing material:** the researcher used the general model (ADDIE) in constructing the experimental processing material, for it contains all the processes included in other models. The general model is the basis of all educational design models, all of which revolve around five basic stages:

**Stage I. the stage of analysis:**

This stage includes the following actions:

**1. Problem Identification and Needs Assessment:** The problem was identified in: low level of Scratch-ready programming skills of junior level computer teachers in Minia Azhari Directorate. The educational needs were identified for them in developing programming skills for Scratch with its both sides of cognition and performance.

**2. Setting the overall objective:** it is the professional development of computer teachers in the preparatory stage of Minia Azhari Directorate by developing ready programming skills using their

"Scratch" through the use of the social platform "Edmodo".

**3. Identification of methodology:** the researcher used two research methodologies: the analytical descriptive method to prepare the theoretical framework, identify the needs of computer teachers at the preparatory stage of the Minia Azhari Directorate, extract the list of skills needed for their development, pass it from a group of experts in the field of education technology, and prepare the list of objectives and elements of content. The second is the semi-experimental method, in a statement of the impact of the autonomous variable (social learning platform) on the dependent variable, computer teachers' (professional development). It was a prior application of the achievement test, then the integration of the research sample into the learning process through the social platform "Edmodo". Then, there was a subsequent application of the achievement test and Observation card.

**4- Analysis of the characteristics of the research group:** The general characteristics of the research group computer teachers of the preparatory stage in the Minia Azhari Directorate, aged 25 or over, with different scientific qualifications but all within computer specialization. They have basic skills to handle computer and internet in accordance with the research needs: the ability to use Windows operating system, internet connectivity, and the use of institutional email.

**5- Identification of the learning environment:** The researcher selected the social platform "Edmodo" in the application of the research experiment, for it was selected by educational institutions in Egypt and disseminated as a communication technique between students, teachers and parents. Moreover, it meets the recommendations of several studies, including Nora Ahmed Abdullah (2019), the study by Mohamed Abdulrahman (2018), and the study by Youssef Abdulmajid, which recommended the need to take advantage of "Edmodo" platform in education for its advantages and capabilities.

**6- Identification of skills list:** The researcher used some studies: Mohammed Sayed (2019), Mahmoud Ibrahim, Youssef Sayed, and Eman Abdulaziz (2019), Marianne Milad (2017), Magdi Saeed & Mona Hassan (2017), Wa'el Samah (2015), and Omaina kamel (2020). Besides, the views of some experts in the field of education

technology have been used to identify the list of skills that consist of (3) main skills below which (24) subsidiary skills fall.

**7- Identification of learning tasks and activities:** In designing educational activities, account is taken of the educational objectives to be achieved and of the educational content provided through the learning platform. This went hand in hand with taking advantage of the social capabilities offered by the platform through the participation of learners in the discussion and exchange of views on the activities required to identify the correctness of their response to those activities.

**8- Identification of learning resources and sources:** available resources were the presence of a computer connected to the internet by each learner from the search group, and the availability of a range of software on devices: a web page browser and the "Adobe Flash Player" program. This is to enable the students of the research group to access the social learning platform "Edmodo". The experimental processing material contained a set of videos produced and then uploaded to YouTube, as well as a set of text files preserved in PDF format.

**Second: The design stage:**

**1- Preparing a list of objectives and content elements:** in light of the final skill list and the general objectives of the learning content, the educational objectives expected of learners have been set. The identification of objectives took into account a realistic formulation that could be observed and measured. Then, the researcher compiled elements of educational content covering procedural objectives after reviewing previous studies referred to in the skill list building sources, as well as the computer book for preparatory first grade. They were logically put in order, to achieve those goals. Then, the list was reviewed by (7) peer-reviewers in the field of education technology to give their opinion on the appropriateness of the content and educational objectives to achieve the general goals. The peer-reviewers agreed 100% on the suitability of the educational objectives and content to achieve the general goals. After doing the modifications proposed by the peer-reviewers, the list of goals and content elements was done in its final form.

**2- Content relay style design:** the content was divided into five graded lessons in levels and arranged logically. Then, the researcher created a virtual chapter, uploading content to be studied by members

of the search group through PDF files and videos. The content show will begin with the title of the lesson, followed by the overall goal, and then the educational objectives to be achieved, followed by a show explain the subject of each lesson. Then, a discussion forum is held after each lesson to exchange with colleagues and the researcher questions related to the lesson's subject, in order to take advantage of the platform's social potential and demonstrate its effectiveness. After finishing the lesson, learners present the required activity, to be evaluated by the researcher and then share and exchange views with all the group members on the various activities offered by them.

**3- Education and Learning Strategies Design:** A vision of how content is presented to research group members is put. Moreover, through research variables, the researcher relied on learner-centered learning strategies that make their role positive, so he focused on the use of an individual learning strategy, in which the learner is self-reliant in showcasing educational content to develop the knowledge and skills required. This happens via interacting with internal links that are posted across the platform. Besides, the strategy of discussion and dialogue has been used through discussion forums on learning topics and chat service between learners or through their communication with the researcher to respond to their queries and exchange different views. Furthermore, the collaborative learning strategy has been used through the performance of educational activities, where learners collaborate in small groups to perform activity after finishing each lesson, and then deliver it to the teacher through the platform to be evaluated and provided by feedback. Those strategies have been used because they are suitable for the age level of the group of the research sample. The strategy is designed in detail to include the following elements:

Serial number	Title of the lesson	Objectives	Activity	Time needed for activity	Learning environment	Activity evaluation

Figure (2): the design of general strategy of learning

**4- Design interaction methods:** The researcher focused on taking advantage of the multiple patterns of interaction methods offered by the platform "Edmodo" as an experimental research processing material, represented in the interaction between members of the research and content group through internal links. Besides, the research group members interact with the researcher by delivering assignments and answering learners' questions and queries and interaction between members of the research group through participation in various panels. In addition, there is an interaction between members of the search group and the interface of the platform "Edmodo", through browsing, uploading files, doing activities and performing tests.

### **The third stage: Development stage**

**1- Identification of software requirements and multimedia production:** Media production requires a range of montage and processing software (Microsoft Word 2016- Adobe Photoshop- Camtasia Studio 8.0- Microsoft Forms). These software programs were used to produce multimedia (text, images, graphics, videos). All media were presented to (3) education technology experts who indicated the media's validity and readiness.

**2- Creating a class on the platform "Edmodo":** The researcher created an account on the platform "Edmodo", then created a class called "Developing the skills of the computer teachers at Azhar Al Sharif", and then shared the "Class Code: 3xwtz" with the students of the research group, after approving the validity of the class and other educational content from (3) experts in education technology.

**3- Exploratory experiment:** the sample-based exploratory experiment was conducted on (15) male and female computer teachers from the preparatory stage at Minia Azhari Directorate, from 1/7/2022 to 25/7/2022. The researcher uploaded the educational content on the platform, watched the learners and observed their interaction within the classroom created on the platform "Edmodo". Moreover, he responded to their questions, queries and discussion, and all the feedback, and opinions of learners were recorded in the exploratory experiment on the experimental processing material provided through the platform and its features. Then, measurement tools were applied to learners and their grades were statistically monitored and processed.

**The fourth stage: The application stage**

The application stage was done by making the experimental processing material available online, and being used by the research group. This will be addressed in more detail in the part of the basic research experiment.

**The fifth stage: Estimation stage**

This stage involved evaluating the cognitive and skill's aspects following students' completion of the content study, through measurement tools used in research; and then analyzing, discussing and interpreting the results.

**3- Building measurement tools:**

**First: Achievement test:** the test is aimed at measuring the achievement by members of the research group of cognitive aspects associated with the professional development of computer teachers in using ready programming of “Scratch”. It is prepared from the type of multiple choice questions, in the light of the following specifications table:

**Table (1) Specifications table of Achievement Test**

Topics	Cognitive Levels			Number of vocabulary /subject	Relative weights of subjects
	Remember	Understanding	Application		
Handle Scratch interface	4	—	7	11	27.5 %
Handle objects and platform ackground in Scratch	—	1	7	8	20 %
Use of group commands in “Scratch”.	1	9	11	21	52.5%
<b>Number of questions per level</b>	5	10	25	40	—
<b>Relative weight of goal levels</b>	12.5 %	25 %	62.5 %	—	100 %

The number of answer alternatives was four taking into account the age of the target group, while the number of test vocabulary was (40). The researcher then prepared the test correction key, where one mark was given for each correct answer, zero for each wrong one. The full

mark obtained by the learner was estimated at the number of correct answers (40), and then prepared electronically using "Forms" service.

• **Test authenticity:** Test authenticity was estimated by:

- **Apparent authenticity:** 5 experts in the field of education technology reviewed the achievement test; In order to ascertain the relevance of the phrases to the research group, and the ability of the vocabulary to measure the objectives to be achieved, as well as the validity of scientific drafting for each individual. All modifications made by the reviewers were received by the researcher. The reviewers agreed 100% on the suitability of test phrases for the research group as well as its ability to measure test targets. The percentages of the reviewers' opinion agreement on the validity of the scientific formulation of the test ranged from (60%: 100%).

- **Internal consistency authenticity:** To calculate the authenticity of the internal consistency of the test, the researcher applied it to a sample group of 15 computer teachers out of the original sample. The correlation factors ranged from the mark of each question to the total mark of the test, i.e. (0.53: 0.80) which are statistically significant correlation factors. This indicates the internal consistency of the test.

• **Test stability:** To calculate test stability, the researcher used the alpha coefficient of Kronbach, and the alpha coefficient of the test was (0.96), a statistically significant factor, indicating that the test was at an acceptable degree of stability.

• **Ease and distinction factors for test items:** ease factors for test questions ranged from (0.27: 0.73). Thus, the test contains a variety of questions in terms of ease and difficulty to match the different levels of the sample's members. It is clear that the test has an appropriate distinction force since the distinction factors for the test questions ranged from (0.20: 0.25). Thus the test is valid as a cognitive tool to assess the achievement of learners in ready programming using "Scratch".

**Second: Observation card:** The Observation card was aimed at measuring the performance of the research group for ready programming skills using "Scratch". The Observation card in its preliminary image included (3) main skills, (24) subsidiary skill and (81) subsidiary action. In drafting the phrases, it was taken in consideration that they have to be in clear behavioral terms, and that they do not contain negation words. Besides, each phrase contains a

single performative act. The researcher used Lycert triple grade to assess the performance level of the group's members. Each learner receives two marks if he/she performs the skill alone, he/she gets one mark if he performs the skill with help, while he/she gets zero if he/she does not perform the skill.

• **Observation card set:** Observation card was set by the following:

- **Card validity rating:** The researcher relied on the card authenticity rating on the apparent authenticity, which was done by presenting the card to (5) reviewers, as referred to above, to give their opinion on the accuracy of the instructions developed by the researcher, the validity and clarity of the procedural wording of the card's vocabulary, the extent to which the sub-skills and their procedures belong to the main skills, and the validity of the evaluation method used to observe learners' performance of the skills. The results indicated that all sub-skills and performance procedures belonged to the main skills except for the second action of the first sub-skill of the first major skill which was deleted according to the opinions of the reviewers. Moreover, the results referred to the agreement of the opinions of the reviewers on the validity of the card, and the method of assessment used to observe the performance of the learners to the skills.

- **Stability:** The stability of the card was calculated using the method of the viewers' agreement. The researcher and two other colleagues<sup>1</sup>, each on his own, observed (15) learners of the reconnaissance sample, and then the consistency was calculated by calculating the correlation factors between the three observers. The correlation coefficient values of the observers using "Scratch" Ready Programming Skills Scorecard ranged from (0.96: 0.97) among teachers at Minia Azhari Directorate, indicating the card's stability and validity.

**4- Basic experimental procedures for research:** The basic experiment for research lasted five weeks from 1/8/2022 to 4 September 2022, where it went through several stages:

• **Selection of research group:** 25 male and female computer teachers were selected from preparatory stage teachers at Minia Azhari

<sup>1</sup> Mohammed Fathi Sayed, Computer supervisor at Minia Education Administration, and Ahmed Rajab Abdullah, Computer supervisor at Abu Qarqas Education Administration.

Directorate, who volunteered to participate in the research experiment from all administrations of the directorate.

- **Preparation for experimentation:** by obtaining administrative approvals.
- **Apply pre-test achievement.**
- **Application of experimental processing material** (integration of students in the learning process through the social learning platform "Edmodo").
- **Application of measurement tools** (achievement test, Observation card) dimensionally.

### **Search results:**

**First: introducing the results of the research in the light of its questions:**

**To answer the first question that read:** What are the ready programming skills using "Scratch" that should be developed by computer teachers of the preparatory stage at Minia Azhari Directorate?

It was answered in the search procedure, where the researcher prepared the list of ready programming skills using "Scratch", and the list included in its final form (3) main skills and (24) sub-skills.

**To answer the second question:** How was the experimental processing material built?

It was answered within the research procedure, where the researcher built the experimental processing material according to the general model of educational design "ADDIE".

**To answer the third question:** What is the effectiveness of a social learning platform on the professional development of programming skills using "Scratch" with both cognitive and performance sides for computer teachers? The researcher tested the validity of the research hypotheses.

**To test the validity of the first imposition, which stated that** "the effectiveness of a social learning platform exists at the level of  $\geq 1.2$  in the development of knowledge associated with Scratch-ready programming skills on computer teachers at Minia Azhari Directorate; using the adjusted earning ratio of "Black".

To verify the authenticity of the first hypothesis, the researcher used a single group test using both pre and post measurements, and

calculated Black's adjusted earning ratio. The following table shows this:

**Table (2): Indication of differences between the median pre and post measurements for research group in the knowledge associated with the programming skills using "Scratch" for computer teachers (n = 25)**

gain percentage	Sig type	Sig level	Value of "T"	telemetry		Tribal		Tools
				scale deviation	Average grades	scale deviation	Average grades	
1.27	Not sign	0.000	51.42	1.76	35.52	2.3	16.96	Cognitive test

Table (2) shows the following:

- There is a statistically distinct factor between the average scores of pre and post measurements for the research group in knowledge associated with the ready programming skills using "Scratch" for the computer teachers at Minia Azhari Directorate, and in the direction of dimensional measurement.

- Black's adjusted earning ratio about the effectiveness of a social learning platform in developing knowledge associated with ready programming skills using "Scratch", was (1.27) which rates above 1.2. This indicates the effectiveness of a social learning platform in developing knowledge associated with ready programming skills using "Scratch" for the research sample.

**To test the validity of the second hypothesis which stated that** "There is a statistical difference of factor at the level of  $\leq 0.05$  between the average performance scores of the research group for ready programming skills using "Scratch". The test score represented 85% of the total mark of the Observation card".

To verify the correctness of the second hypothesis, the researcher compared the scores of the research group in the dimensional application and the test degree representing 85% of the total mark of the Observation card. It was determined using the following equation:  
 Test score = Total card score  $\times$  85/100 = 136.

The researcher used a single group (t) test to compare between the performance scores of the research group for the ready programming skills using Scratch and the test score. The following table shows this.

**Table (3): Test (t) to compare between the average performance scores of the research group of ready programming skills using Scratch and the test grade representing 85% of the total mark of Observation card (n = 25)**

Sig type	Sig level	Value of "T"	scale deviation	Average grades	test score
Not sign	0.000	11.4	4.20	145.62	136.00

Table (3) shows a statistically factor distinction in favor of average search sample scores in the Observation card. This indicates the high level of the sample research in the ready programming skills using "Scratch" as a result of exposure to the social learning platform.

### **Second: Interpretation of research results:**

The improvement in the cognitive aspects of ready programming skills using "Scratch" in the research group can be attributed to:

- Clear and specific formulation of educational objectives helped the students of the research group in identifying different topics of content, and a deeper understanding of them.
- Presentation of content through the social learning platform "Edmodo" in accordance with their abilities and capabilities. Besides, the reliance on the style of self-learning, so that each learner learns according to his/her speed and abilities, has increased their cognitive attainment.
- Diversity of sources of content to learners (videos, PDF files).
- The social platform "Edmodo" offers a good educational environment that helps to create a safe psychosocial atmosphere among teachers and learners. It guarantees freedom of opinion and expression, pausing questions, and arguments, thereby getting rid of learners' shame barrier.
- In addition to building experimental processing material according to the following:
  - **Principles of Social Constructive Theory:** Which is concerned with initiating an educational attitude by creating an incentive and exciting preparing for learners to increase the motivation of learning. Moreover, it is concerned with the relationship between the teacher and the learner, encouraging dialogue, and allowing discussion between learners and their peers and between them and the teacher.

- **The principles of communication theory:** it is concerned with the diversity of different opinions and points of view helping to create knowledge in an integrated manner, and find perfectionism.

- **Principles of behavioral theory:** it is concerned with actively building knowledge through providing periodic interactive activities for learners after each lesson, and analyzing learners' characteristics associated with cognitive aspects and performance needed to study planned content through the learning environment.

This result was consistent with the results of Samah Anwar & Salim Abdullah (2020), Reem Abdullah (2020), Sameh Jameel (2019), Nora Ahmed (2019), Hikmat Aish & Ranan Ali (2018), Yousef Abdulmajid (2017), Aisha Saleh & Riyadh Abdulrahman (2017), Yousef (2017), Erwin & Nurlaily (2017) which emphasized the effectiveness of the social learning platform "Edmodo" in knowledge acquisition.

The high level of performance of ready programming skills using "Scratch" is due to:

- Division of skills into sequenced and interrelated sub-functions, which increased learners' focus on skill details.
- Modeling the right steps to perform and display skills through videos, which gave the chance to see the most accurate details in skill performance.
- Holding group panel discussions through the latest news feature, helped to make group interaction with different learners' queries through the participation of teachers and other learners.
- Support and continuous follow-up to learners during the performance and evaluation of activities and providing feedback. It led to a higher level of students' performance of skills.
- In addition to designing and producing experimental processing material according to:

- **Principles of social constructive theory:** concerned with presenting educational content in a variety of forms and media. This has helped to attract more attention from learners and to identify educational activities that learners will carry out individually or within groups after each lesson. This has led them to practically exercise skills during the learning process.

- **Principles of communication theory:** it is concerned with allowing learners to test their skills and identify their procedural errors while

performing activities through feedback. This contributed to their mastery of skill performance.

- **Principles of behavioral theory:** it is concerned with the association of learning activities with learning objectives, giving opportunities to the learner to practice and repeat through offering skills in the form of videos. This helps to repeat the viewing of skills performance so that he/she can master them during practice.

This result is consistent with the results of the studies of Mohamed, Fatma (2021); Nanda, Erwin (2021), Reem Abdullah (2020); Sameh Jameel (2019); Asmaa Abdunnasser (2018); Riyadh Abdulrahman & Aisha Saleh (2017), Yousef (2017), which emphasized the effectiveness of the social learning platform "Edmodo" in developing the different skills of learners.

**Research recommendations:**

- Approval of the study by the Al-Azhar Institutes Sector as a professional development program for computer teachers at the preparatory stage.
- Holding training workshops and preparing guides aiming at acquiring/developing the skills of using and employing teachers' social learning platforms.
- Constant attention to teachers' evaluation through professional development programs aimed at dealing with teachers' shortcomings in their specialization.

**Suggestions for further studies:**

- Making similar studies on computer teachers to deal with shortcomings in specialization at different levels of study.
- Preparing a study that aims at detecting the steps of Al-Azhar Al-Sharif's teachers and students towards the use of social learning platforms.

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## فاعلية منصة تعلم اجتماعية في التنمية المهنية لمعلمي الحاسب

### مستخلص البحث:

هدف هذا البحث إلى تقصى فاعلية منصة تعلم اجتماعية في التنمية المهنية لمعلمي الحاسب بالمرحلة الإعدادية بمنطقة المنيا الأزهرية في العام الدراسي 2022/2021، وتم استخدام منصة "Edmodo" الاجتماعية، ولتحقيق أهداف البحث اتبع الباحث المنهجين الوصفي وشبه التجريبي، وتكونت مجموعة البحث من (25) مُعلم حاسب، وتمثلت أدوات القياس في (اختبار تحصيلي لقياس الجوانب المعرفية لمهارات البرمجة الجاهزة باستخدام سكراتش "Scratch"، وبطاقة ملاحظة الجوانب الأدائية لمهارات البرمجة الجاهزة باستخدام سكراتش "Scratch")، وقد تم عمل فصل افتراضي يضم مجموعة البحث على المنصة والذي احتوى على مقاطع فيديو، وملفات Pdf، وأنشطة تفاعلية؛ ومنتديات للنقاش واختبارات تكوينية، وقد طُبّق الاختبار التحصيلي قبل التعلم وبعده، وطُبقت بطاقة الملاحظة بعد التعلم؛ وأظهرت نتائج البحث فاعلية منصة التعلم الاجتماعية "Edmodo" في التنمية المهنية من خلال تنمية مهارات البرمجة الجاهزة باستخدام سكراتش "Scratch" بشقيها المعرفي والأدائي لدى معلمي الحاسب.

**الكلمات المفتاحية:** منصة تعلم اجتماعية، منصة "Edmodo"، سكراتش "Scratch".

