

Standard levels for the development of a micro-learning environment in the light of communication theory

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مجلة البحوث في مجالات التربية النوعية

معرف البحث الرقمي DOI: 10.21608/JEDU.2023.210320.1878

المجلد التاسع . العدد 46 . مايو 2023

التقييم الدولي

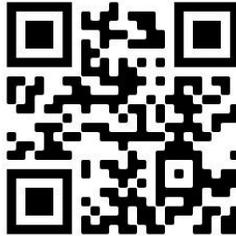
P-ISSN: 1687-3424

E- ISSN: 2735-3346

موقع المجلة عبر بنك المعرفة المصري <https://jedu.journals.ekb.eg/>

موقع المجلة <http://jrfse.minia.edu.eg/Hom>

العنوان: كلية التربية النوعية . جامعة المنيا . جمهورية مصر العربية



Abstract

The aim of the current research is to identify the educational normative levels of a micro-learning environment in the light of communicative theory, the technical normative levels of a micro-learning environment in the light of the communicative theory, and the research relied on the descriptive-analytical approach to the research and literature of education technology. The importance of the research is due to opening the door for researchers to apply micro-learning or to integrate it into e-learning.

Directing the attention of researchers interested in the field of educational technology to conduct studies and research designing micro-learning environments using educational, technical and technological standards for micro-learning environments. The arbitrators have to make the necessary adjustments in light of the opinions of the arbitrators The research also made several recommendations, such as adopting the standard levels that were used in the current research so that they are a guiding model for designing micro-learning environments in the light of communicative theory, conducting more reviews of these standards, in order to comply with recent technological developments in the field.

key words

Standard levels - micro-learning environment - communicative theory.

Introduction:

Micro-learning appeared at the turn of the century as a development of e-learning methods as a result of a number of factors, including: easy access to information resources via the Internet via smart phones and mobile devices, the spread of social networking sites, and the ease of sharing information among millions of Internet users around the world. In addition to the information and technology revolution. This has led to an unprecedented doubling of knowledge and information as well as an increase in awareness of the value of self-learning and development. Continuous learning and training represents an added value for every individual in contemporary societies. Continuous learning is not seen as something that can be dispensed with, but has become a necessity for improving performance, and here the role emerges. The main role of micro-learning in the learning economy, and creating opportunities for everyone to obtain more scientific knowledge and practical skills in an accelerated and limited time without temporal or spatial restrictions.

Most Internet users around the world practice micro-learning daily in one form or another, by searching for accurate and brief information on a specific topic, through a search engine, which is known in English as the term Googling, and the spread of smart phones may help its users access the latest information at any time and at any time. anywhere and in the format they need. In addition, due to the features available, in the micro-learning method, the learning speed is chosen by the students themselves. They can access the educational content for as much time as they want, at their own pace. Therefore, microlearning methods can provide students with the required knowledge and skills they need as they discover a path in their individual lives. (Fatani & El Gendy, 2021). (Abdel-Fattah, 2021)

Defines it as a small learning block that is designed to achieve specific learning outcomes, and can be used in formal and informal learning, and is typically designed using interactive multimedia, which is an approach that focuses on the learner and provides him with timely learning, and on devices Multiple

electronic programs that ensure easy and quick access, and are applied by learners.

Abdel-Aleem (2018) believes that micro-learning has many advantages, including: - It allows the learner to learn on the go and in waiting times. Encourages learning and absorbing information quickly. Micro-learning is an innovative and exciting way of learning and acquiring skills and knowledge, which makes it more enjoyable and attractive. The urgent need to obtain and acquire knowledge in light of the crowding of connections and preoccupation with job tasks and personal and family burdens. The emergence of some innovations, such as: Web 3, cloud computing, devices Mobile, big data, which contributed to creating a suitable environment for micro-learning.

The urgent need for continuity of learning, and lifelong learning. Many researches and studies have confirmed the effectiveness of using micro-learning, such as the study of Zhou, N., 2018), (Al-Qarni, 2020), and (Wali, 2020), which can be summarized as follows:

- Supporting classrooms and improving retention of knowledge and skills found in classroom lectures.
- A daily learning method that allows the student to learn at any time, place and time, provided that there is internet and mobile applications.
- It relies on some educational platforms such as social networks and web tools that allow participants to learn from home.
- An innovative way to transfer skills and knowledge, transform learning into fun and activity, and engage in group discussions.
- It facilitates the development and updating of its courses in line with the new trends, because it is flexible and capable of development.

According to teaching and learning theories, in a way that achieves the highest benefit from these environments in achieving different learning outcomes. Micro-learning is based on many theories, including the "connectives theory", which provided distinct support for learning through micro-learning environments.

Students participate in the acquisition and creation of knowledge through contributions by providing mini content (Boring, C, 2020, 18).

From the foregoing, it is clear that most of the studies have dealt with the micro-learning environment in terms of the impact of its use and application in the learning process, as well as the criteria for designing micro-learning environments. **Study Problem:**

There are many reasons that led to the spread of micro-learning, and made it a subject of discussion among specialists in the field, the most important of which is that micro-learning represents the ideal solution for developing digital content in a short time and at a lower cost for the teacher and the learner, and the development and spread of portable devices such as laptops, smartphones and devices Other tablets contributed to the use of mini-learning And that is through the learner's access to the desired content without being restricted by time or place, and the mini-learning emphasizes the main points that the teacher wants to reach clear to the learners, in addition to that it contributes to saving the learners' time through the speed and ease of access to the subject that is difficult for him, and reviewing the content And activities related to it to reach a deeper understanding of it, and the ability of learners to memorize and remember information more, because the information is not given to the student in one go, but is fragmented into small units; Thus, it is easy for him to organize and link information in a way that facilitates his retrieval when needed.

Through the previous presentation, the importance of micro-learning and its advantages became clear, and hence the need for a study aimed at the variables of its development in the light of communicative theory as one of the learning theories.

Study questions:

The following sub-questions branch out from it:

1. What are the standard educational levels of a micro-learning environment in the light of the communicative theory?

2. What are the standard technical levels of a micro-learning environment in the light of the communicative theory?

Objectives of the study:

The current study aims to identify:

1. The educational normative levels of a micro-learning environment in the light of the communicative theory.
2. The technical normative levels of a micro-learning environment in the light of the communicative theory.

Study Approach:

The current study followed the descriptive analytical approach to research and literature on educational technology.

Research steps:

The research followed the following steps

First: Preparing the theoretical framework for the research by examining the educational literature represented in education technology books, and previous research related to the subject of the research.

Second: Presentation of women writers and previous studies and research related to the criteria for designing micro-learning environments.

Third: Conducting the field study by applying the following:
Preparing a list of criteria for designing micro-learning environments by:

- Compilation of learned criteria and their logical classification
- Develop indicators for each standard.
- Preparing the initial version of the list of criteria and presenting it to the arbitrators as an exploratory sample
- Presentation of the preliminary list to a sample of professors and specialists in educational technology and curricula

research importance:

- Opening the door for researchers to apply micro-learning or to integrate it into e-learning
- Directing the attention of researchers interested in the field of educational technology to conduct studies and research in designing micro-learning environments using

educational, technical and technological standards for micro-learning environments.

search limits:

The current research is limited to deriving the criteria and the evaluation tool from studies, research and related literature that could be obtained and then presented to a sample of professors and specialists in the field.

search terms:

Design of micro-learning environments

The researcher defines it procedurally as one of the types of e-learning, which means learning through small units that focus on a specific cognitive skill or competency, which makes it commensurate with the trend that calls for continuity of learning and lifelong learning.

Connectivism

It is a theory that discusses education as a network of personal knowledge that is created with the aim of involving individuals in education, building it, and strengthening communication and interaction via the Web. The communication theory based on the principle of networking also emphasizes digital learning through networks, and the use of computer technology tools and the Internet in education. (Al-Farmawy, 2021).

Theoretical framework and previous studies:

First - micro-learning

Micro learning concept

There are many literatures dealing with the concept of micro-learning, such as: (Friedler.A, 2018, 7), (Atallah, 2019, 14), (Ibrahim, 2020, 13), and (Lexman, R, 2020) is defined as

- A small learning block that is designed to achieve specific learning outcomes and can be used in formal and informal learning and is typically designed using interactive multimedia, which is a student-centered approach that provides learning at the right time and on multiple electronic devices that ensure access to it easily and quickly and is applied by the students.

- Short learning sessions that focus on small amounts of information to make trainees more able to do their work effectively by mastering specific and actionable goals and used to quickly prepare trainees to perform specific tasks that increase their productivity.
- One of the types of e-learning, which means learning through small units that focus on a specific cognitive skill or competence, which makes it commensurate with the trend that calls for continuity of learning and lifelong learning.

Characteristics of microlearning:

Microlearning has a set of characteristics agreed upon by both (Adhipertama, 2020, 135) (Shamir, 2020, 7) as follows:

1. Short period: There is no such thing as the correct length, but it is generally based on short-term education. Some lessons are only a few seconds long. Because if you are at work and encounter a problem, you need quick solutions that do not lead to leaving work for a long time.
2. Small Units: More important than length is that it relies on small units that will support a learning task while reducing complexity. They are self-explanatory, self-contained, and independent, yet still serve as part of a larger unit.
3. Using the story: Human memory is established through the association of ideas and meanings, and as the learning content in micro-education shrinks into smaller and smaller units, learning contexts become more important. Story is a convenient way to do this. Stories don't need to be long. A story can be told using a single image, or just a few words.
4. Repetition: If you need to learn something in a short period of time, it helps to make your content repeatable so that it allows you to come back to the passage you want. MicroLearning allows you to focus on the more difficult parts at the beginning and then the individual items that are less important and can be quickly covered.

The reasons that led to the spread of micro-learning:

Fennelly-Atkinson, R (2021, 33) indicates that there are many reasons that led to the spread of micro-learning, and made it a subject of discussion among specialists in the field, the most important of which is that micro-learning represents the ideal solution for developing digital content in a short time and at a lower cost for the teacher and the learner. Also, the development and spread of mobile devices, laptops, smartphones, and other tablets contributed to the use of micro-learning, through the learner's access to the desired content without being restricted to time or place.

Micro-learning also emphasizes the main points that the teacher wants to communicate clearly to the learners, in addition to that it contributes to saving the learners' time through the speed and ease of access to the subject that is difficult for him, and reviewing the content and activities related to it to reach a deeper understanding of it, and the learners' ability to memorize and remember information in a larger way, because the information is not given to the student all at once, but is fragmented into small units; Thus, it is easy for him to organize and link information in a way that facilitates his retrieval when needed.

Micro-learning is a type of new teaching resource, and the primary content of the micro-learning resources is video clips and audio clips along with complementary teaching resources such as teaching design, teaching materials related to educational curricula, student reactions towards teaching, practice tests, and student feedback. Learning resources are by learning. Mini is different from traditional learning resources (Zhou, N., 2018).

Lin (2020, 8) believes that micro-learning is one of the most appropriate new technologies in the education and development of teacher training professionally, as it allows lifelong learning by motivating them to continue searching for new information and knowledge associated with learner-centered learning processes and approaches, as it is fragmented learning that requires time Short in education, training and achieving the expected results, which suits their modern conditions in terms of

heavy daily workloads that include teaching, administrative and curricular activities in addition to their social responsibilities, which may take up most of their free time. And he agreed with him (Ma, N., 2021, 9) achieves self-learning as it focuses on the practical application of the acquired knowledge and problem-solving by providing open online learning resources that enable learners to choose what they learn according to their own pace and according to their own needs at any time and any place, Therefore, it is characterized as flexible and personal learning that enables them to retrieve the content as much as they wish and evaluate the efficiency of their learning through activities and mini-assessment tests at the end of each lesson, maintaining their enthusiasm and desire to learn, avoiding burnout and establishing a sense of professional achievement.

Principles of microlearning design:

Micro-learning should be designed in such a way as to reduce the cognitive load that is presented to the learners-trainers, and this will give the learners the opportunity to process what they learn more effectively and with ease, and cognitive overload is reduced in the design of training based on microlearning, as pointed out by Al-Qarni (2020, 472) and Lin, J (2020, 9).

- **Content Simplification:** Microlearning removes all content that is absolutely unnecessary to the learning process, for example, when you design a slide show to provide information, you should minimize the amount of extraneous graphics that are used entirely.
- **Divide the content into a comprehensible size:** Micro-learning is based on dividing the content into smaller learning units. It encourages learners to proceed with the training program only when they are fully aware of the current material. This will ensure that their working memory is not empty and the information can be transferred effectively into their long-term memory.
- **Using different educational techniques:** through micro-learning information can be presented in different ways, for example, presenting some information orally and other

information visually, such as pictures or graphs, this will allow the trainee to absorb information using different processing methods, which reduces the cognitive load Plus, where microlearning uses a variety of resources - alone or a combination of two or more, to make the learning process exciting and engaging. The type of resources used in microlearning depends on the stage, the type of training to be given and the learners' preferred learning styles.

Challenges and obstacles of applying micro-learning:

Despite the mentioned advantages of micro-learning that led to an increase in the effectiveness of its use in the educational environment, those interested in this method of learning indicated some defects that may hinder its widespread use in the educational field. Micro-learning may not be suitable for learning complex skills, or when students learn A subject for the first time, but makes the best use of reinforcement, as micro-learning helps students develop their performance. Emerson, L, 2018, 7).

In addition, mini-learning derives its strength and ability to deliver focused information to the learner on a specific topic, but at the same time this educational unit should be linked with other educational units so that the final picture of the knowledge or skills that should be possessed on a specific topic is formed. Failure to achieve interdependence between educational units leads to distorted or unclear knowledge or skills for learners, and thus failure to achieve the desired goals (Major, A, 2018, 28).

Theories that support microlearning:

There is a need to pay attention to the design of micro-learning environments according to teaching and learning theories in order to achieve the highest benefit from these environments in achieving different learning outcomes. Micro-learning is based on many theories of the “connectives theory” in a distinct support for learning through micro-learning environments, where the communication theory adopts the idea of networks consisting of students who want to exchange ideas on a common topic for learning, and in the model of communication through mini-

learning, students participate in Gaining and creating knowledge through contributions by providing mini content (Boring, C, 2020, 18).

feedback:

The concept of feedback:

As Tyas (2019) defines it, it is the information that is issued regarding a particular response, and uses the switch of the next response. The concept of feedback in learning is seen as a multi-form expression process that shows the extent of the future influence of one of the means of knowledge, or the extent of the influence of knowledge or the extent of the influence of the means on this future, to measure the effectiveness of the means, or the delivery channel that was used in delivering messages (p. 25).

Types and patterns of feedback:

There are many types and patterns of feedback used in the educational process, and each type or pattern has a goal, steps, and procedures that it goes through. Time factor, and the number of students in choosing the type or style. The idea of feedback is based on a reaction to the student's response, and the reactions of the faculty member are varied and patterned according to the degree of correctness of the student's performance. They are either informational, corrective, explanatory, or reinforcement. (Al-Mulhim, 2021, 85).

Search procedures:

Research Procedures: Preparing a list of criteria for selecting cloud learning management systems by going through the following steps:

Determine the target from the list of criteria:

The general objective is to reach a list of a set of educational and technical standards for the micro-learning environment.

Determine the sources of derivation of the list of criteria:

Several sources were referred to when building the list, namely: Analyzing the literature and previous studies that dealt with micro-learning and examining the standards they included and analyzing them as a study. Micro-learning is based on some Arab and foreign literature, studies and research, as well as the opinions of experts and specialists in the field of educational technology with regard to the criteria for developing (designing and

producing) micro-learning environments and the results of the recommendations of previous research and studies and related conferences, including (Fatami, 2021), and (Abdul Al-Fattah, 2021), (Suleiman, 2022), and (Al-Basil, 2023). In light of this, the list was built, the opinions of some professors in the field of educational technology.

Preparing the default image for the criteria list:

Through the previous sources, the criteria were formulated in their initial form in the form of phrases, each of which represents a prerequisite that should be available when choosing a micro-learning environment.

Presentation of the list of criteria to the arbitrators:

The initial image of the list was presented to a group of arbitrators specialized in the field of curricula, teaching methods and educational technology.

Making the necessary amendments in the light of the opinions of the arbitrators:

The amendments were made in the light of the opinions of the arbitrators in terms of adding some necessary criteria and deleting the criteria that cannot be observed and measured. Appendix (1).

Search recommendations:

- Adopt the standard levels that were used in the current research so that they are a guiding model for designing micro-learning environments in the light of communicative theory
- Carrying out further reviews of these standards, in order to keep pace with recent technological developments in the field.
- Developing a time plan by decision makers to work on accelerating the application of micro-learning systems.
- Organizing training courses for university faculty members to train them on the use of micro-learning in building successful courses.
- Including in the curricula of educational colleges detailed topics on micro-learning and training students to use it, so

that they can benefit from it during practical education and when they are assigned to schools.

Suggested research:

- Conducting studies on standards for designing and publishing courses through micro-learning environments.
- Studying the impact of different tools and activities used within micro-learning environments on learning outcomes.

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A list of criteria for developing a micro-learning environment according to the communicative theory

educational standards
Objectives
1- Formulate behavioral goals proper procedural formulation
2- Formulating behavioral goals is a sound linguistic formulation
3- Goals are achievable
4- The formulation of the goal includes performance indicators
5- Show objectives at the beginning of each topic
6- Integration of goals related to different subjects to achieve the general goal
7- The educational objectives focus on improving the practical skills of each learner.
8- Objectives describe the behavior of the student, not the behavior of the environment.
Content
1- Content is related to goals
2- Determine the educational tasks required of the learners in light of the objectives
3- The educational tasks are linked with the learning objectives
4- The content is appropriate to the nature of the skills to be learned
5- Logical organization of content
6- Linguistic content integrity
7- One content achieves the learning of one skill
8- The content is divided into topics, main and sub-headings related to each other
9- The content is presented in a clear, unambiguous manner.
10- The content is characterized by flexibility and periodic updating by the teacher
activities

1- Learning activities center around the learner
2- Diversity of activities commensurate with the characteristics of the learners
3- Learning activities develop students' thinking skills
4- Activities take into account individual differences
5- The learning environment sets specific and fixed dates for the start and end of activities
feedback
1- The learning environment provides both immediate and delayed feedback
2- The learner is given more than one opportunity to correct his answer
3- The environment provides the appropriate feedback to provide sufficient information about the response
4- Provide feedback clearly
technical parameters
pictures
1- Pictures and graphics are simple
2- Use familiar pictures and graphics
3- Considering the close connection between the selected images and graphics and the textual content.
4- Provides the ability to enlarge and reduce images and graphics.
5- Distribute images and graphics appropriately on the screen.
6- Using images and graphics functionally within the learning environment according to the educational need.
7- Pictures and graphics are of high definition and clarity.
8- Observe the accuracy of the colors of the pictures and graphics within the learning environment
texts
1- Texts appear within the learning environment clearly and legibly.
2- The wording of texts is grammatically correct.
3- The texts are clear
4- Avoid vague or complex terms.
5- Observe the use of punctuation marks in writing.
6- Follow one type of writing font in writing the main titles.

7- Follow one type of writing font in writing sub-headings.
8- Follow one line of writing for detailed writings (Matn).
9- Avoid unusual or ornate fonts, especially in text writing.
10- Use different text effects, in an appropriate manner
the video
1- The duration of the video does not exceed 7 minutes
2- The video clip focuses on a specific skill
3- The goal of the video is clear
4- The quality of the video clip is suitable for viewing clearly on different devices
5- Video and one accomplish one goal
6- The video can be played back
7- You can stop at a specific point in the video
8- Attract the learner's attention
9- The video playback speed is appropriate
10- Appropriate sound and image in the video clip with its purpose
User interface
1- The environment provides tools for interaction between the teacher and the learner
2- Allows synchronous and asynchronous communication between the teacher and the learner
3- Allows synchronous and asynchronous communication between learners and each other
4- The environment has a progress bar showing the learner's progress
5- An achievement board is available in the environment
6- The environment allows the learner to print documents
7- The environment allows the learner to upload the video clip