Original Article

Contribution of Pedagogical Scripting-Mediatization-Mediation to the Effectiveness of Online Learning System

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Abstract - *In times of the Covid-19 pandemic, teachers have faced various difficulties due to the rapid transition to distance learning, including the complexity of designing and mediatizing effective online learning systems. Confronted by this complexity, innovation in the design and development practices of these learning environments is crucial, especially after the health crisis and the 4th industrial revolution, which involve the use of new information and communication technologies and changes in teaching modalities. The objective of this article is to present a detailed description of the research methodology of our thesis, the research questions, the hypothesis, the problem and the objectives of the project. In this work, we assume that integrating mediatization-mediation in pedagogical scripting will contribute to designing and producing effective online learning systems. In conclusion, the quality of these systems will be greatly enhanced by the improvement of pedagogical scripting and mediatization.*

Keywords - *Mediation, Mediatization, Online learning system, Pedagogical scripting, Technologies.*

1. Introduction

The global educational landscape has undergone tremendous changes after the Covid-19 pandemic. Distance learning during this period involved using information and communication technologies, multimedia production tools, etc. During this health crisis, some teachers have encountered difficulties designing and developing online learning systems, using e-learning platforms and mediatising training and learning.

Faced with this emergency, to ensure the continuity of education, teachers have used "traditional" methods - the projection of face-to-face teaching methods onto distance learning. This is due to their traditional training and several constraints. Adapting their practices to this crisis situation was a complex process; they could not "plan and mediatize" for a crisis learning situation, two constraints that should be at the heart of instructional engineering, according to Peraya and Peltier (2020a).

Peraya and Peltier highlight the lack of attention paid to mediatization processes, which are part of the effective use of educational engineering. This little attention is an underutilization of the potential of this engineering, according to Leclercq [1]. Underestimating these processes would conceal the articulation between mediatization and its effects in terms of mediation, thus eliminating any possibility of examining the effects of media dispositifs on different aspects of learner behavior [1]. So, it is not enough to just focus on the mediation process and use an approach based on content effectiveness. Proper mediation requires taking mediation into account and adopting a learner-centered approach.

In the same context, Bonfils posed a number of questions that could be the subject of future research. A particular question sparked our interest so far as it relates to our subject: What place should be given to mediatization and mediation? [2]

In addition, the changes imposed by covid-19 on education have shown that traditional and artisanal design methods have proven inefficient and insufficient. Post-pandemic instructional engineering should promote and enhance mediatization and mediation processes. Therefore, rethinking practices in designing and developing online learning dispositifs remains necessary. In particular, emphasis should be put on mediatization and mediation, two important dimensions in these dispositifs.

In view of the recurring problem of underestimating the mediatization process and the arguments put forward previously, we have chosen a thesis topic entitled " Contribution of Pedagogical scripting-mediatization-mediation to the effectiveness of online learning systems".

In this topic, mediatization and mediation are considered necessary parameters for the effectiveness of an online learning system. The main objective is to improve the quality of online learning dispositifs by ensuring their design and development effectiveness.

2. Literature Review

According to J. Basque (2004), integrating ICT into university training environments has contributed to the complexity of learning systems. Therefore, the design and implementation of these systems require more rigorous methods than the intuitive and artisanal ones traditionally used by teachers [3].

Among the changes implied by ICT, the teacher must take on new roles in the instructional engineering process or delegate some of these new tasks to specialized professionals. In addition, the complexity of the design process of these new learning systems requires the intervention and collaboration of a multidisciplinary team of competent specialists [4]. Faced with this complexity, one of the tasks that a teacher can entrust or share with specialized professionals is the process of the mediatization of a learning system, which might be delegated to media production specialists or mediatization specialists.

Furthermore, designing an online learning system is a complex process. It is not the transposition of the practices of traditional face-to-face courses. This transposition involves a process of mediatization [5]. The projection of these practices does not allow the learner to develop his skills in a situation integrating ICT, which should arouse his motivation and enable him to build his knowledge by confronting him with a complex situation that triggers a cognitive conflict and helps him to use his prior knowledge.

As an example of the artisanal practices of teachers that Pierre-André Caron mentioned (2020): some teachers recorded themselves on a 4-hour video, exposing the course they used to give in a lecture hall, then they broadcast it on social media without knowing if it was watched and by whom [6].

In online learning systems, new roles for teachers emerge. They are no longer transmitters of knowledge but rather mediators, facilitators, moderators, tutors, designers, evaluators, etc. This role of the mediator is important to avoid the learner's isolation and to guide his learning.

Mediation is a social communicative act between a designer, who transmits a mediatized message, and a receiver, who receives it [7].

Peraya (2019) recalls the two forms of interactivity distinguished by researchers E. Barchechath and S. Pouts-Lajus in the context of instructional design and tutorial design (educational software design). The first is functional interactivity which manages the communication protocol between the user and the machine. The second form is intentional interactivity, which manages the communication protocol between the user and the software designer, physically absent but remains present by the trace he leaves through the software or any other mediatized technique [8]. The author's imprint, the way in which the recipient is approached, addressed and involved, constitutes a form of the mediatization of the relationship. It is a form of mediatized interaction rather than interactivity [9].

Introducing these 2 forms of interactivity into a dispositif, taking into account mediation in the mediatization process, can ensure the effective transmission of the mediatized message.

However, mediation is challenging for instructional designers, who often forget the interactional component when prioritizing content [7]. They are concerned about mediatization at the expense of mediation.

On the other hand, according to Peraya (2010), any act of communication must be divided into two distinct dimensions: the content and the relationship between the interlocutors. In addition, the human dimension and the pedagogical relationship must not be forgotten in the design of these systems. For Peraya, every pedagogical act, like any act of communication, has an important relational aspect. It is, therefore, not enough to simply mediatize content. The pedagogical relationship must also be the subject of a process of mediatization [10].

3. Problematic

Mediation is characterized by the diversity of its forms in literature. Peraya and other authors have proposed a model of technological mediation that retains 5 forms of mediation. In fact, technological mediation is considered the origin of other forms of mediation since it is constitutive of the dispositif, while other mediations result from the effect of the system on the behavioral and cognitive behaviors of its users [11].

Moreover, the complexity of the relationships forged by the forms of mediation and their interdependence hinders the achievement of the objective pursued by most educational designers, engineers and teachers, which is the design and implementation of a totally satisfactory and effective learning system [11].

This situation gives rise to a major problem, the difficulty of designing and developing an effective online learning system, which requires in-depth study to provide solutions that would make it possible to achieve the assigned objective. Indeed, it will be necessary to understand the

impact and influence of technological mediation and other forms of mediation on the entire mediatized system and the learning that takes place within it to mediatize this dispositif successfully.

On the other hand, the spatio-temporal rupture and the distancing of the teaching and learning process impose constraints on designers and teachers. D. Peraya and C. Peltier (2020a) have identified two constraints that should be at the heart of educational engineering: "The first is the obligation to plan, organize and schedule all teaching and learning activities throughout the course. It is, therefore, necessary to design both a global and specific scenario for each course's activities. The second, linked to the fact of teaching asynchronously, is that of mediatization, the putting in media of the resources and, progressively, the learning activities, then the learning system."

The problem also fits into another perspective, that of the constraints imposed on designers and teachers by the distancing of the teaching and learning process, which are the pedagogical scripting and the mediatization of the learning system.

Thus, our central problem in this research is posed as follows:

"How does the introduction of the mediatization-mediation relationship in pedagogical scripting contribute to the effectiveness of the online learning system? "

To address this issue, we will propose a mediation model that will serve as a basis for justifying the choice of mediatization tools. We will also work on a conception of mediatization according to the nature of mediation. Then, we will design a pedagogical scenario of an online learning system based on the choice of these tools and this conception of mediatization. Thus, our scenario will integrate two important dimensions - mediation and mediatization - in the scripting process of a dispositif. Finally, we will conduct an empirical study and test this scenario on a sample.

4. Project Objectives
4.1. General Objective
Ensure online learning systems' effective design and development to improve their quality.

4.2. Specific Objectives

- Provide guidance to teachers in the design and development of online learning systems.
- Optimize the pedagogical scripting process of an online learning system.
- Contribute to the success of the mediatization process of an online learning system.

The implementation of these objectives will be achieved through the design of a mediation model, drawing on existing mediation models in the literature, which will serve as a basis to guide the justification of the choice of mediatization tools. After justifying the choice of these tools, we will proceed to design the mediation according to the nature of the mediation. Finally, based on this conception, a pedagogical scenario of each learning activity will be designed, integrating mediation and mediatization as two important parameters.

The results and expected products of this thesis will allow the effective choice of media and technologies, the right choice of learning activities and a proper design of the mediatization of these activities depending on the nature of mediation.

5. Research Questions
We will use an instructional design model, the cyclical ADDIE model (Agile version of ADDIE), to design the learning system. This model proposes 5 consecutive and iterative steps that are interrelated. The evaluation phase is located at the center of the process. In the event of an error, it is necessary to return to earlier stages. This ensures successive revisions of the system under development. These five phases are Analysis, Design, Development, Implementation, and Evaluation. Due to its simplicity and fluidity, as well as the fact that it is a very broad and adjustable model, the ADDIE model is regarded as a good framework for the development of new training [12].

Instructional engineers, instructional designers, etc., are faced with several constraints in the design of an online learning system. For example, they must choose the most appropriate mediatization tool for the learning situation and the learning dispositif. First, it will be necessary to start with the choice of activities. Then, design a global scenario of the learning. The choice of mediatization tools as well as that of the LMS, should be made before starting mediatization, that is to say, in the design phase of the ADDIE model during which the pedagogical scenario is conceived. While mediatization takes place during the development phase of ADDIE.

The design and development of new learning systems cannot be approached as intuitive and artisanal processes. It is required to rethink traditional practices and consider designing and developing pedagogical content adapted to a coherent pedagogical scenario suitable for these new systems. The pedagogical scenario must be used as a reference in the mediatization of the educational resources of the dispositif. To this end, we intend to integrate the mediatization-mediation dimensions into the pedagogical scenario in order to improve the quality of learning systems.

In order to better operationalize the research, we have declined some research questions:

• What is the contribution of the mediatization-mediation relationship to the design and development of an effective online learning system?

• What criteria should be used as a basis for the choice of mediatization tools? What type of tool should be used and when?

• How to choose mediatization tools to mediatize learning activities according to the nature of mediation in order to show the impact of mediation on mediatization? Which mediation, for which mediatization?

• How to choose learning activities according to the nature of mediation?

• Based on the choice of mediatization tools and the conception of mediatization, depending on the nature of mediation, what pedagogical scenario for the online learning system?

6. Hypothesis

As a solution to manage the complexity of designing and mediatizing effective systems, we will present a pedagogical scenario, integrating mediatization and mediation, which will contribute to improving the quality of online learning dispositifs.

Based on the problem and the lack of attention to mediatization taking into account mediation, we have put forward a number of hypotheses. With this research, we seek to confirm the following hypotheses:

(H_1): Proper choice of activity + Proper global and particular scenario + Proper mediation + Proper choice of mediatization tools = Effective design

(H_2): Effective design → Effective mediatization

(H_3): Mediatization according to mediation + Pedagogical scenario of each activity = Effective mediatization

(H_4): Effective mediatization → Proper development

(H_5): Proper design + Proper development + Proper implementation → Effective device

6.1. Keys to the Effectiveness of a Learning System

(H_G): Effective design → Effective mediatization → (Proper development) + Proper design + Proper implementation → Effective dispositive

We assume that the right choice of activities, the proper pedagogical scripting, the proper mediation and the right choice of mediatization tools contribute to effective design.

Effective design will allow effective mediatization, which will be achieved through integrating the conception of mediatization according to the nature of mediation in the pedagogical scenario. Proper mediatization will ensure good development. Finally, the right design, development and implementation will lead to an effective system.

7. Research Methodology

Our research will be carried out as follows:

7.1. Bibliographic Search

• Search and read relevant publications related to our subject and analyze them in order to find out where the reflection on mediatization and mediation stands.

• Conceptual framework: Define the key concepts: online training, mediation, mediatization, learning system, pedagogical scripting, articulation between mediation and mediatization, etc.

• Theoretical framework: In this step, we will conduct a literature search to identify the topic, the different positions adopted by other researchers and the main theories related to the subject. This research will help formulate relevant research questions and hypotheses. Then, we will determine the existing gaps (research gap) in the literature to reveal the final research problem through an analysis of researchers' work on the subject. Finally, a review article on mediatization - mediation will be published.

To reach the results, we will proceed as follows:

7.2. Building Research

To build our research, we will draw on the work of researchers to design and conceive the following productions:

• Mediation Model Design

• Justification of the choice of mediatization tools

• The conception of mediatization according to the nature of mediation

• Design of a prototype of the pedagogical scenario of an online learning system integrating mediation and mediatization

• Publication of an article about the mediation model and the scenario.

8. Empirical Verification

Carry out an empirical verification to test the hypotheses through the experimentation of the pedagogical scenario on a sample. The stages of this study are:

• Carry out a sampling: target a sample likely to provide relevant results, study the representative sample to establish conclusions applicable to all, and justify the sample's choice and its characteristics. We will choose two samples from the Higher Normal School of Tetouan.

- Establish an action plan for the collection of data on the profile of learners: collect information on learner profiles through a qualitative and quantitative study using research tools: interview teachers to determine the profiles of their learners, use and adapt Kolb's learning style questionnaire (questionnaire survey) to this context.

- Preparation of study materials: LMS, learning resources, questionnaire, interview guide, measurement (note-taking, audio recording, transcription of recordings).

- Adaptation of the pedagogical scenario to the profile of the samples and its implementation in an LMS.

- Present the study results in the appropriate formats (numerical data or reasoned paragraphs).

- Analyze the results obtained to draw conclusions.

  - ✓ Discussion of results to confirm or refute hypotheses.

  - ✓ Publication of an article analyzing the empirical results.

  - ✓ Distinction of the research's strengths and limitations and openness to new research work (directions for future research) relative to ours.

9. Conclusion

In an era characterized by the proliferation of information and technology, educational engineering is forced to keep pace with dynamic changes, especially after the pandemic and the advent of the 4th industrial revolution. The new educational engineering should promote innovative practices in designing and developing online learning systems.

In the new dispositifs, the most important thing is to use technology in the service of pedagogy. There is no point in focusing on mediatization at the expense of mediation. The focus should not only be on mediatization and mediation but also on the most effective media and technologies that can be used to ensure the success of the mediatization process.

In our thesis, we assume that introducing the mediatization-mediation relationship in the pedagogical scripting will contribute to the system's effectiveness. Indeed, by integrating the conception of mediatization - which will be designed in this work - into the dispositif, mediatization can take into account the nature of mediation while using new technologies. The product will be a pedagogical scenario that is valid even with the technology change and that can be adapted and modified according to the training context and the profile of learners.

References

[1] Daniel Peraya, and Claire Peltier, "What the Pandemic is Doing to Pedagogical Engineering and what the Rubric can tell about it," *Distances and Mediations of Knowledge*, 30, 2020b. [CrossRef] [Publisher Link]

[2] Philippe Bonfils, "Rethinking Training Systems in Light of the Pandemic?," *Distances and Mediations of Knowledge*, 2020. [CrossRef] [Publisher Link]

[3] Daniel Peraya, and Claire Peltier, "Pedagogical Engineering: Twenty Times on the Job Let's Hand Over Our Work," *Distances and Mediations of Knowledge*, 2020. [CrossRef] [Publisher Link]

[4] Josianne Basque, "How has ICT Changed how University Professors Engineer Learning?," *International Journal of Technologies in Higher Education*, vol. 1, no. 3, pp. 7-13, 2004. [CrossRef] [Publisher link]

[5] Claire Peltier, "INFOX#7: E-learning is just a Simple Transposition of a Face-to-Face Course," Blog of the Pedagogical Innovation Laboratory, University of Fribourg. [Online]. Available: https://lip-unifr.ch/2020/04/01/infox7-le-e-learning-nest-quune-simple-transposition-dun-cours-presentiel/

[6] Pierre-Andre Caron, "Setting up Distance Education During the COVID-19 Pandemic," *International Journal of Technologies in Higher Education*, vol. 18, no. 1, pp. 102–113, 2021. [CrossRef] [Publisher Link]

[7] C. Cardona, "*Towards an Empowering Hybrid Dispositif for Future FLE Teachers in Colombia,*" Ph.D. Dissertation, Sorbonne Nouvelle University, Paris, 2015.

[8] D. Peraya, "Technical Objects in Training. Contribution of the Concept of Dispositif in the Analysis of Mediatized Learning Processes," *Humans and Machines, Tribute to the Work of an Explorer,* Dijon: Reasons and Passions Editions, pp. 206–218, 2019.

[9] Daniel Peraya, "Mediatization and Mediation. From Educational Media to DWE," in *Mediations,* V. Liquète, Ed. Paris: CNRS Editions, pp. 33-48, 2010. [Publisher Link]

[10] Daniel Peraya, "A Critical Look at the Concepts of Mediatization and Mediation: New Practices, New Modeling," *The Challenges of Information and Communication*, 2008. [Publisher Link]

[11] Bernadette Charlier, Nathalie Deschryver, and Daniel Peraya, "Face-to-face and Remote Learning: A Definition of Hybrid Devices," *Distances and Knowledge*, vol. 4, no. 4, pp. 469-496, 2006. [CrossRef] [Publisher Link]

[12] Hassane Kemouss et al., "The Addie Pedagogical Engineering Model: From Analysis to Evaluation," *Handbook of Research on Scripting, Media Coverage, and Implementation of E-Learning Training in LMS Platforms*, United States of America: IGI Global, pp. 42-70, 2023. [CrossRef] [Google Scholar] [Publisher Link]