Evaluation and Classification of a Learning Object in teacher education in the Region Valley do Jaguaribe, Ceará-Brazil

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Abstract: Being chemistry an experimental science, one can not rule out it of its essence that is the experiment, this working as a strategy for creating situations where problems will influence the learner in decision-making and therefore help in the improvement of knowledge. Unfortunately performing practices in many schools is hindered, either by lack of equipment or lack of suitable place. Forward the new era of computerization, with the support of new Information and Communication Technologies (ICTs), this may not be a problem, as with the insertion and dissemination of these new technologies the company is undergoing changes in their profile, these changes come including in the educational setting, it is impossible to imagine the distant school ICT world. Based on this, this study aimed to describe, classify and evaluate the use of an educational object, the Chemistry Virtual Laboratory (VLABQ). It was developed with a group of undergraduate chemistry course at the Faculty of Philosophy Dom Aureliano Matos (FAFIDAM / UECE-Ceará-Brazil). In this work we can see the learning object interface from their materials available to their practices and verified in accordance with the opinion of the licensing acceptance of the object for all (100%), which shows clearly on the subject, easy handling. Concluding that this object has some characteristics consistent with some previous work on the subject and can come to be an excellent tool to work in teaching chemistry.

Keywords: Information technology. Learning Objects. Chemistry teaching. Science teaching.

1. Introduction

Chemistry is a science whose "knowledge is established through the complex and dynamic relationships involving a very specific tripod: chemical transformations, materials and their transformations and models [01]" In this way the teaching of science to carry out experimental activities becomes needed to understand the content as it can function as a situation creation strategy problems which allows the contextualization, conducting questioning and investigation [02], since the experimental activities students are involved in experimental testing, evaluating results, exercising reasoning, solving problems and thus are encouraged to challenge [03], but this occurs when the practical activities are not carried out in the form of a cake recipe, which is when the teacher delivers students the results already expected [02].

Unfortunately not always the chemistry teaching is awarded experiments achievements, from the simple transmission of traditional classes are limited [04] be limited to short through mathematical calculations, laws, formulas and nomenclatures [01] which may have come to influence the theory and practice connection, thus affecting the entire learning process, as the experiment approaches the school content with everyday student.

The difficulties identified in the work of Novaes, Aguiar and Afonso [05], to carry out practical activity is the high cost of material, equipment, lack of infrastructure. The authors cite in their work the need to expand the concept to other laboratory environments such as kitchen, patio, library, garden and classroom. Thus, you can also enter the computer lab as a means to carry out experimental activities for the development of technological means of the current century also entered the education space, these new information and communication technologies have brought to teaching numerous educational objects they can come to allow the complementation of the teaching and learning process.

Technologies of Information and Communication (ICT) are rated as technologies used to gather, distribute and share information [06], they are increasingly present in our everyday lives, and
without realizing "adapt our way of acting, thinking, communicate by integrating these new means to our behaviors [07]. Today the distance is no longer a problem for people of different cultures and places to exchange information, communicate and therefore learn, since the "expansion of possibilities of communication and information through devices such as telephones, television and the computer changes our way of life and to learn today [07] ", that is, the inclusion of these new ICTs has been no change in society by changing the way how the information is received, conceived and transmitted [03].

In this modern society, the intelligent machines (computers, mobile phones, tablets) will populate more and more people's daily lives [08], because we are surrounded by these new technologies, at home, on the street, at work, in the hands and even institutions teaching. "Fitting the educational field include and take their communicational and educational potential the best out [08]", since its integration education is no longer an option, but a necessity, it is necessary awareness of all the innovative visions of education to take advantage of the "communicative and informative possibilities of new technologies [07]" to conduct a critical and quality education.

ICT used in teaching involving a way to bring more information to the student, allowing the development of more elaborate classes [09], for example, introducing non-existent material or is difficult to access in the schools, in addition, provide a construction knowledge together between the student and the teacher, and on the other hand also allows the teacher through the learning object use address a wider range of ideas and theme aspects in study [10], which can provide significant improvements in the scenario educational.

Learning objects are resources and digital tools that can be used and reused in order to assist in the learning process of teaching through play and interactive [11], allowing simulating an environment on the computer, develop multiple stages of a learning activity without necessarily handle a concrete material. [12] In addition to digital files are also classified as any resource that can complement lessons taught in [13] room.

Use the Learning Object (AO) enables the development of more freeform knowledge and autonomous, as on the many resources available the student can choose the one that most appeals to you according to your taste and preference [14] come to make if an active subject in the construction of knowledge, committing more to search for information which in turn will solidify increasingly learning [10]. Given the existence of numerous authoring tools of learning with characteristics very similar objects, it is necessary to use a common classification model that suits their users, taking into account two aspects, the aspect of how knowledge is created and past and technologies can be used [15].

Through the repositories, web site that contains useful digital resources for formal or non-formal learning, learning objects proliferating on the Internet making available user materials that facilitate learning in both distance learning as support classroom teaching [16], thus being more present in the daily lives of students, and can access both in formal education environment as non-formal spaces [17]. The Educational objects have some characteristics that are mentioned in the work of the Cross. [11] These characteristics are of educational and technical fields. Pedagogical features can mention interactivity, autonomy, cooperation, cognition and affection. The technical features are accessibility, aggregation, autonomy, durability, scalability, flexibility, metadata, portability and reusability. In the work of Santos and Amaral [17] are cited some forms of classification of an educational object, which are simulation and modeling, Hypermedia, Tutorial, Pedagogic Games, Exercises and practices and Intelligent Tutoring. Based on this, this study aimed to evaluate and classify an agreement with criteria of learning object established in the literature and opinion of a group of undergraduates in Chemistry, Faculty of Philosophy Dom Aureliano Matos (Ceará-Brazil).

2. Methodology

Limoeiro do Norte is a city located in the region of Valley do Jaguaribe, specifically the Lower Jaguaribe, region as well as in all semi-arid northeastern water is always a limited factor human occupation has the characteristics of the areas with greater water availability, are the most commonly used [18], and its culture based on agriculture and livestock. The installation of Faculty of Philosophy Dom Aureliano Matos (FAFIDAM) in Limoeiro do Norte, as stated before, the city of Lower Jaguaribe, provided teacher training in the various fields of knowledge, working in the various existing schools in this sub-basin of the Jaguaribe Valley.

The developed research was exploratory and descriptive, qualitative basis. Was performed with a group of licensing the course of Chemistry at the Faculty of Philosophy Dom Aureliano Matos (FAFIDAM), a unit of the State University of Ceara (UECE) based in Limoeiro do Norte-CE / Brazil.

The research aimed to describe, assess and classify a learning object the LABVIRTUAL®. The work was carried out in two moments, namely:

The first time was the classification of learning objects used; the second time the evaluation of the object by undergraduate chemistry course. For evaluation and classification of the learning object was used as well as articles related to Educational
Objects classification, a questionnaire where students they felt about the use of virtual learning objects in classes of chemistry discipline.

3. Results and Discussion

In the work of Santos and Amaral [17] cite some classifications for a learning object [16], the authors cite Simulation and Modeling, Hypermedia, Tutorial, Pedagogic Games, Exercise and Practice and Intelligent Tutoring. Among them the one that is closest to the object used in the work is Object Simulation, “features that simulate a real system or procedure which allows students to obtain or manipulate the data that simulated situation,” which according to Arantes, Miranda and Studart [16] allowed the visualization of concepts assisting in demonstrations in lectures. In this work we used the software VLabQ® (http://vlabq-laboratorio-virtual-quimica.programasejogos.com), consisting in a virtual laboratory chemistry, a great program to simulate laboratory practice (Fig.1).

Figure 1. Home screen of Virtual Chemical Laboratory.

Virtual Chemistry Laboratory contains 4 practices, Conservation of Matter, Simple Distillation, reversibility of the reactions, Titration acid and base and Specific Heat. Contains tools necessary for a real Fig.2 laboratory, glassware (such as test tube, beaker, flask, pipettes, beakers, pH meter, thermometer, flasks and test tubes), and other laboratory equipment (balance, heating plate, porcelain capsule Bunsen and crucible nozzle). Its characteristics also user option is to save his practice to open or continue at another time, and at the end of the activity can print it.

To start a new practice, the user must go to the File area, select the option to start practice, then select the desired practice, the labor wing appears to the introduction and methodology necessary information to build and run the practical activity, Fig. 03. After finishing the experiment has the option to save and print.

Figure 2: Demonstration of some materials available in VLABQ®

Figure 3: A method for opening a new practice

In each practice available in Vlabq, contains introduction, methodology and results, data that help the user to perform the same. Following the steps correctly can be mounted and run the experiment, achieving the expected results. At the time of evaluation and classification of the object, was mounted and run a simple distillation, Fig. 04. This virtual experiment presented beginning, middle and end, being flexible. In the Cross [11] work, mentions that the classification of a learning object should be taken into account if it is flexible, which is an essential feature.
The following are on each point marked in the figure shows each of the learning object that serve to start, open and run a simulation in VLABQ, Fig. 05. The file is the art where the option of starting a new practice, open an activity saved, save or clean work environment, equipment is are available all materials required to assemble and carry out practical activities in the entry bar is where it is available information on the experiment, the procedures bar are described step by step how to proceed and the necessary equipment, the results bar exposes questions that guide the user and the final conclusions. Following the steps in the methodology, the user can carry out their practice and get the expected result.

Figure 5. File menu, equipment, Introduction, Methodology and Results.

According to analyze the questionnaires answered by licensing, figure 6, we noted that when asked about clarity on the subject worked, 57.4 agreed and 42.6% strongly agree that the VLABq object presents clarity, which may influence the development of learner autonomy during their handling, which is an important feature in the classification of a learning object, which is quoted in the work of the Cross. [11]

When asked about possible uses of this or other learning objects in their regencies, it was observed that most said they would use in their classes, in relation to possible difficulties in using such classes resources, all (100%) disagreed to be difficult their use, the young people today are more familiar with these technologies, it is not so difficult to use in school routine out, what may come to be a difficulty in its use is related to lack of training of teachers and the pedagogical use of them [19].

Figure 6: Using the virtual object in future chemistry class

When asked about the use of this learning object for the simulation of an experiment, it was found that all (100%) approved the idea, and the same (100%) disagreed on the use of the virtual object is an activity difficult to apply this correlates with responses from undergraduates as the clarity of the object also is noteworthy that nowadays we often find schools equipped with computer laboratories school (laws). All (100%) agree that technological tools applied in education contribute to learning in a positive, figure 7, since the use of these new features can become the most visible concepts to students, allowing you to interact with some tools or relate the content covered with what he already knows. [20]

Figure 7: Use the virtual object in future chemistry

4. Conclusion

In the process of teaching and learning proposals which encourage the student to perform reflections and connect the knowledge acquired in school with their daily lives. The educational object presents characteristics consistent with some previous work which may allow its use in the completion of chemistry teaching.

According to the responses of undergraduate group chemistry course, it can be concluded that the object was well accepted by all, presents clarity, and easy to use to simulate an experiment, and can come to be an excellent tool to support chemistry teaching discipline in the various methods of teaching.

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6. References


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