Finding a Solution to the Problem "Low level of Scientific for Some Students in the High Schools", Using Hypermedia Technology online.

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Abstract: The development of educational tools is a very important target, encourage us to seek methods to improve and increase student education level. In this paper, the method to keep pace with the developments in technology is discussed and investigated in this field. On the other hand, it has compatibility with teaching methods in general, by using hypermedia technology to improve the student education level in preparatory school. This study is on the theoretical approach to specify and design the suggested prototype, ten schools randomly had been chosen in Karbala governorate as a sample within the boundaries spatial of study, select criteria prototype's work, because of it cannot replace the teacher, made a questionnaire for choosing schools which are covered in this work domain in prototype.

Keywords: Hypermedia technology, E-learning, Teaching aids, adaptive learning system, web application

1. Introduction

To improve the scientific level in students is an obsession of all educational establishments, especially teachers. We can see that they use various means which help them to make curriculum easer .These means used by teachers depend on the educational stage, in other words, the various as difficulty and ease as curriculum.using these means are for creating a mental link (mental link principle came from a study as a subject in conditional-response theory by Russian scientist Pavlov, he got Nobel award at 1904, theory 's concept was that "you hear, see, smell or feel a thing which makes you remember other things"). In this case, a mental link will connect information and place and time in student's brain to improve his memory, as result student will remember this information quickly and doesn't forget it, this useful for conclusion in students, Subsequently became development means of education or find new methods is a very important and urgent necessity because it helps teachers in explanation hard information.

In this work, an attempt to find the new method more interactive, in which help students and teachers to do progress in teaching and learning process, using hypermedia technique as a prototype on world wide web (www), design and this prototype was an attempt to improve teaching and learning process in the education field to get the desired results in teachers and students in the same time.

The main reason to choose this topic was that suffering school administrators generally of low scientific levels in their students. This work involves design a web application it will be included in Karbala education of directorate's website, which suggested the prototype will be.

The prototype should feed by the curriculum at the beginning, teachers can feed prototypes with information and questions that will lead to increased activity in the classroom.The prototype has to include a system to count student's levels depend on their activities in it, an questionnaire had been distributed randomly to a group of schools in Karbala governorate to elect the sample in which will apply the suggested solution. Then the elected list of schools must be done not to have any problems with staff deficiency because the schools which have not staff efficiency the issue of low level in students had been diagnosed as a deficiency in teaching staff.

Finally, the recommendations were that, firstly, develop and implement this model and apply it to get the real result, lastly working on a new version of the supposed model for self-education.

2. Background of study

The low educational level of students in high schools is a serious problem and cannot be ignored, because it is a major reason for wasting the efforts of the staff for both teachers and parents equally, on the other hand, it leads to Students' reluctance to attend school especially who have an intermediate level, either for voluntary

reasons (the student left the school by his will as a result of his belief that it is useless to continue) or compelling (by losing their opportunity due to repeated failure in the same stage).

The low level of students is Obsession to every teacher due relevant to the future of students, their professional and social lives, and this, in turn, affects their psychological stability and reflects their disorder in the stages of childhood and adolescence, while the issue is related to the surrounding circumstances, so the reasons that led to this must be investigated (Barakat and Harz Allah, 2010, Al-Awfi 2013).Also, academic achievement is the sum of factors related to motivation and the surrounding environment, while others are related to mental and cognitive abilities (Al-Astal, 2010). As a result, the teachers use motivational methods and Innovate illustrative methods that stimulate creativity change the student's direction towards learning (Abed, 2009).

3.Research problem

After the researcher was briefed on the general situation of schools in the holy Karbala governorate through field visits that include 10 schools, knowing the scientific levels in students through a questionnaire to obtain the required information and specifically the low level of the students, if it was related by specific lessons, the presence of educational means, the numbers of students in the class, the presence of libraries and laboratories in schools in addition to the efficiency of the teaching staff. It was found that all schools that absorb are suffering from the problem of the low level of students.

Figure1. Questionnaire for specifying the sample Subject to conditions for applying the proposed prototype

Research goal: Improving the scientific level of students in the high schools by creating a web application in the international network.

4.Research importance

The research derives its importance from the following points:

- Teachers' and school's administrations' anxiety besides their interest in improving the scientific level of students.
- Adoption and development of aids, especially in light of technological development in the modern world in which we live.
- The study hopes to attract the attention of students and exploit their interest in technology, especially computers and smart phones, and harness it in the field of learning and study.
- Therefore, we have sought in this work to find an entertaining and practical method to make the student acquire basic information in lessons in addition to the enriching information related to these lessons without getting bored.

5.The border of the study

The study border involves the follows:

- Spatial: Schools affiliated with the Iraqi Ministry of Education, Holy Karbala Governorate.
- Timeframe: The academic year 2017-2018.
- The human: middle schools in the holy city of Karbala (departments, teaching staff, students).

6.Study limitations

They are summarized as follows:

- It is determined in selecting a random sample for ten middle schools in Karbala Governorate.
- The study is determined by the sincerity of the research tools and the objectivity of the subjects under study, and their honesty in transferring information useful for the study.
- The data provided in the study are within the spatial border is mentioned above.

7.Theoretical literature and previous studies

The current study has dealt with the concept of the low level of education and academic achievement of students, hypermedia technology, previous studies, and experiences in the field of using hypermedia technology in learning, and in the following points are presented.

7.1.Academic level and academic achievement

It is the outcome of education, and it is the extent to which the student, teacher or institution achieves their educational goals. Academic achievement is usually determined to utilize tests or continuous evaluation, but not everyone has agreed on the best way to test this or its most important characteristics - procedural knowledge such as skills or declarative knowledge such as facts (Barakat, Z., and H. Harz Allah, 2010).

As far as the scientific level from the researcher's point of view, it is the scientific result acquired as a result of learning, and it is an indication of an increased academic achievement.

7.2.The Hypermedia technology.

Hypermedia is a term that expresses a new technical phenomenon that allows the learner to control many means by computer and provides the learner with an educational environment saturated with educational media that helps to unify forms of information from various sources in one system, which is a system that can be controlled by a computer and this system includes many of Media such as motion pictures, video clips, audio recordings, digital data, movies, photos, and music, in addition to the text, to help the learner achieve the goals expected of him when he comes to the information he needs through self-training.
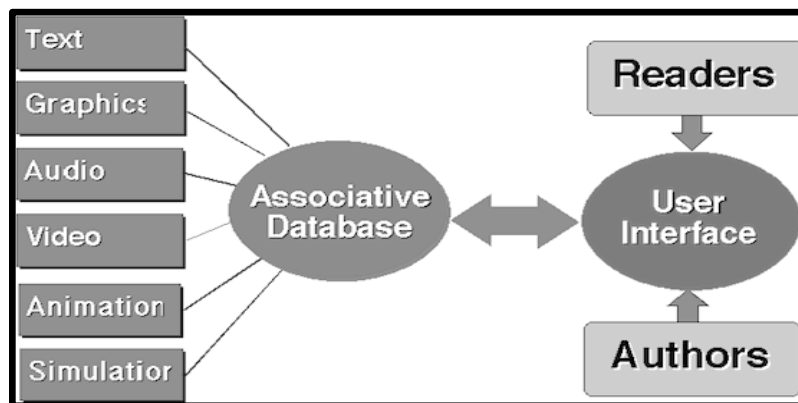
Figure 2. Diagram showing the work of hypermedia in the field of education

Hypermedia is defined as a mediator non-linear information that includes graphics, sound, video, plain text, and hyperlinks. This term was first used in an article written by Ted Nelson in 1965. The World Wide Web (www) is a classic example of super media, while a non-interactive cinema show is an example of standard multimedia with no hyperlinks.

7.2.1. Development tools

There are a lot of development tools for creating an application that works with hypermedia technology, but what we care about in this work is to use modern high media via web pages. So any text editor can be used to write code for instance (Notepad ++).Through application programming platforms, hypermedia is used as an intermediary and constraint in some APIs. Hypermedia is an application status engine and is under implementation from the REST application architecture where the client interacts with the entire server through the hypermedia dynamically provided by the application servers. The researcher believes that this technology can be harnessed to solve the mentioned problem.

7.3.Previous studies

7.3.1 Designing an adaptive learning system based on a balanced blend of learner design and the learner-centered scheme

Improving the effectiveness of teaching, facilitating learning among learners, encouraging lifelong learning and maximizing motivation, as well as reducing dropout rates are among the major issues of adaptive learning systems (ALS) that invade the interest of educational actors and partners, especially in higher education (Amal Battou).

7.3.2 Merging the learner model into the learning management system environment

Most higher education institutions use the learning management system to manage and assist in the learning process. However, most of the existing learning management system does not support allocation as found in the current adaptive learning management system. It is important to properly analyze the learner's activities to determine the type of information that should be saved (A. Sangodia, M. Munyande, BK Yuen).

7.3.3 Designing Adaptive Hypermedia Learning Systems: A Cognitive Approach.

In the past decade, a number of ultra-adaptive learning systems have been developed. However, most of these systems only allocate content for presentation and navigational support that familiar to students. On the other hand, previous research suggested that cognitive methods largely depended on students' learning because they indicate how learners can process and organize information (Freddy Mampadi, Sherry Y. Chen, Gheorghita Ghinea, Ming-PuuChen (May 2011)).

After reviewing the previous studies, the researcher demonstrated the following points:

- There is a close relationship between developing learning skills and the use of illustrative and educational aids.
- It has good capabilities and enabling us to use it to solve the research problem.

- Hypermedia technique is considered an auxiliary factor in developing skills and the teacher cannot be replaced according to previous studies.

8.Procedures

This part of the research deals with the study methodology, tools, statistics, design requirements, description of the characteristics and features of the proposed model. The study is based on the theoretical aspect through preparing the requirements and specifying the features for designing the applied model for the proposed solution, the treatments needed to access the information supporting the statistics.

Initially, a questionnaire was conducted to elect the sample to be worked on, the questionnaire is shown in Appendix No. 1. The purpose of the questionnaire is to choose an appropriate sample for the prototype, knowing that the model is supportive of the teaching staff and not to cancel their duties, the chosen sample has to fulfill the two conditions below.

- That the school does not suffer from a lack of teaching staff.
- -The number of students in the class must be within the prescribed limit.

Otherwise, the problem will be possible fix by increasing the number of teaching staff to be sufficient and reducing the number of students according to the planned number, which is 30 students as a maximum of the instructions of the Iraqi Ministry of Education.

Based on the questionnaire data, it became clear that there are only three schools that fulfilled the two conditions mentioned above, and thus the proposed model can be applied to these schools later, which will be with the following characteristics and requirements:

8.1. The requirements

The requirements are the most important part of the design, and through it, the features and the final form of the model are determined to be able to perform the tasks and functions for which it was prepared to obtain the desired results. Below is a viewing of the requirements that have been concluded through what has presented in the research problem above, and It is divided into two main sections, namely the educational side, the administrative, and the statistical side.

The educational aspect is the most important part of the model because it feeds it with the data needed to get the job done, This part includes user interfaces for students and teachers, and they contain curricula. Through it, the terms and concepts contained in the curriculum can be clarified through videos and external links that can benefit the students, the mechanisms of interesting presentations to trigger student curiosity, simulation programs for experiments to create an interactive environment, and finally online tests prepared by professors.

Administrative and statistical aspect, This part is concerned with presenting statistics on students' activities and attendance, calculating the levels of progress and view them to the administration and the teaching staff, as well as parents so that they can know the levels of students.

8.2. The features of the suggested prototype

Depend on the requirements mentioned above, the prototype will be a web application that we propose to have on the internet, which consists of three main parts.

(1) The teaching staff part.
(2) Students' part.
(3) Parents' part.

Below is a description of the features and characteristics of this prototype according to the mentioned components above.

8.2.1. The teaching staffs part

This basic part is to feed information and prepare lessons and lectures, and by it, the teacher can unleash his imagination and his ideas in a way to clarify and explain the lesson by setting the necessary links and videos to clarify some of the subjects that he considers ambiguous and difficult to understand, he will be free to act with

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this lesson, taking into account the orientation of the student's mentality, because he is the most knowledgeable of his students 'levels and he is more experienced than others about the subjects of the lessons, therefore he can use this space away from the time limitations, place and classroom or laboratory capabilities in the school.

8.2.2 The student segment

It includes the following elements (availability online and easy to use, suspense in presenting information and motivation and interactivity). The availability of the prototype online is useful to enable the students to access at any time and place, thus gives more freedom to the users (students) to deal with it without any restrictions, ᵊn addition to, the ease of use, it makes students not need skills to deal with it. Suspense is important to trigger the student's curiosity to discover and learn more without getting bored or tired, and for this, it is necessary to using interesting methods in presenting information and focus on the important ones and support it with practical examples, on the other hand, the motivation appears in the prototype as strategy game to create a kind of competitive spirit. Moreover, Interactivity is an important condition for the achievement of the mental link to be created to memorize the information the student had gained so that he can remember them easily.

9. Conclusions

Using hypermedia to create the proposed prototype which involves the mentioned characteristics could perform the desired purpose in improving students' scientific levels in general, especially if the aforementioned system has been fed with the basic elements of videos, images, and links to display more detailed and certain information, also interactive and deductive questions have a major role in motivating the student is to search for information that is useful for answering it, especially if all aspects of the lesson are covered through links to facilitate the search process and guide students towards the right path in the search for information related to the lesson. The statistical system helps teachers and school administration know the levels of progress of students and facilitates the process of Parents' follow-up to their children, students. Overall, the application of such a system will contribute to the development of educational methods and also facilitate the work of teaching staff in schools and stimulate and increase the desire of students to learn by exploiting their love for technology and smart devices.

References

1. Pavlov I.P. (1951). Twenty-year experience of an objective study of the higher nervous activity of animals // Poln. Sobr. Op. 2nd ed. T. 3. Book. 1. M.-L.1951.
2. Nelson, T. H. (1965, August). Complex information processing: a file structure for the complex, the changing and the indeterminate. In Proceedings of the 1965 20th national conference (pp. 84-100).
3. Barakat, Z., & Harz Allah, H. (2010). The Reasons for the Low Level of Academic Achievement in Mathematics at Elementary Level at Tulkarem schools. Al Queds Open University.
4. Al-Astal (2010). Factors leading to low academic achievement for students of the upper basic stage in UNRWA schools in the Gaza Strip. Master Thesis, Islamic University, Gaza.
5. Ribhi Mustafa Alayyan, Muhammad Abd al-Dibs. (1999). Communication Technology and Education Technology: Othman: Safa House for Publishing and Distribution.
6. Bashir Abdel-Rahim Al-Kloub.(1993). Technology in the Learning and Teaching Process. I / 2 Othman Dar Al-Shorouk.
7. Mampadi, F., Chen, S. Y., Ghinea, G., & Chen, M. P. (2011). Design of adaptive hypermedia learning systems: A cognitive style approach. Computers & Education, 56(4), 1003-1011.
8. Gorard, S., & Smith, E. (2008). (Mis) Understanding underachievement: a response to Connolly. British journal of sociology of education, 29(6), 705-714.
9. Heng, L. E., Sangodiah, A., Muniandy, M., & Yuen, P. K. (2018). Retracted: Integration of learner's model into learning management system environment. Journal of Fundamental and Applied Sciences, 10(6S), 1771-1778.
10. Lim, E. H., Sangodiah, A., Muniandy, M., Isawasan, P., Yuen, P. K., & al Nallusamy, S. (2019, November). Integration of Teaching Taxonomy into Personalized Learning Management System using Felder-Silverman Model. In 2019 IEEE Conference on Sustainable Utilization and Development in Engineering and Technologies (CSUDET) (pp. 29-33). IEEE.
11. Battou, A. (2017). Designing an adaptive learning system based on a balanced combination of agile learner design and learner centered approach. American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS), 37(1), 178-186.
12. Ward, A., Stoker, H. W., & Murray-Ward, M. (1996). Achievement and ability tests-Definition of the domain. Educational measurement, 2, 2-5.
13. Marchionini, G., & Crane, G. (1994). Evaluating hypermedia and learning: Methods and results from the Perseus Project. ACM Transactions on Information Systems (TOIS), 12(1), 5-34.
14. Obondo, G., Nabwire, V. K., & Too, J. K. (2018). Effects of hypermedia on learning achievement in geography for hearing impaired learners in mixed special secondary schools in Kenya.
15. Phobun, P., & Vicheanpanya, J. (2010). Adaptive intelligent tutoring systems for e-learning systems. Procedia-Social and Behavioral Sciences, 2(2), 4064-4069.