

Instructional design: missing loop in e-learning educational softwares for medical education

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Background: E-learning is one of the new ways to learn nowadays which for efficient e-learning in their formulation of electronic content that is usually presented through instructional softwares we should care. Not using educational design in designing softwares content is considered one of the main challenges in e-learning and also failures of this educational system. This study aims to investigate the Missing loop of educational design in educational softwares in e-learning in educational environments for medical education.

Methods: Qualitative content analysis method of deductive type is used in this study. The Society of the study is chosen from MA students of e-learning courses in medical education faculty of Shahid Beheshti University of Medical Sciences for which the purposeful sampling is used and 60 students are selected. The instrument for the study was Semi-structured interview through which the interviews were held with the individuals about the instructional software used in teaching in a purposeful way. The time for each interview ranged from 20 minutes up to 1 hour and all the interviews were lasted for a week. The interviews were held at the level of theoretical saturation until reaching a response. The questions of the interviews for the students were designed based on the standards of electronic learning equipment which included five levels of content, tracking, educational design, and educational and technical media.

Results: The results show that the software used in teaching for the students in medical education faculty of Shahid Beheshti University of Medical Sciences has the smallest correspondence with the criteria used from the aspect of electronic learning equipment standards and there are lots of problems especially in some aspects of content, tracking and educational design. The existence of such varied problems in medical educational softwares is arising from problems in technological approach and educational approach such as educational design. This proves the necessity of attention to the principles of instructional design in both preparation and production of such softwares.

Conclusion: This survey suggests that paying attention to the principles of design in the preparation and development of educational software can, as an approach, respond to some of the educational needs and improve the quality and effectiveness of educational training. Developing the educational software based on educational design patterns is one of the basic challenges of e-learning and also it's the key to success for this educational system. It's necessary that executing agencies and organizations and universities of e-learning have special attention to educational design and implementation of scientific approaches to put it into practice.

Keywords: Criteria and standards, Educational softwares, E-learning, Instructional design, Medical education, Qualitative content analysis

طراحی آموزشی: حلقه مفقوده نرم افزارهای آموزشی سیستم یادگیری الکترونیکی در علوم پزشکی

زمینه و هدف: یادگیری الکترونیکی یکی از شیوه های نوین یادگیری در عصر حاضر است که برای کارآمدی یادگیری الکترونیکی باید در تدوین محتوای الکترونیکی آنها که معمولاً از طریق نرم افزارهای آموزشی ارائه می شود دقت نمود، عدم استفاده از طراحی آموزشی در طراحی محتوای نرم افزارها یکی از چالش های اصلی در یادگیری الکترونیکی و عدم موفقیت این سیستم آموزشی محسوب می شود. پژوهش حاضر با هدف بررسی حلقه مفقوده طراحی آموزشی در نرم افزارهای آموزشی در محیط های یادگیری الکترونیکی آموزش پزشکی صورت گرفته است.

روش: در این پژوهش از روش تحلیل محتوای کیفی از نوع کیفی استفاده شده است. جامعه آماری پژوهش را دانشجویان دوره کارشناسی ارشد دوره یادگیری الکترونیکی دانشکده آموزش پزشکی دانشگاه شهید بهشتی تهران تشکیل می داد که از روش نمونه گیری هدفمند برای انتخاب آنها استفاده شد و تعداد 60 نفر به عنوان نمونه پژوهش انتخاب شدند. ابزار پژوهش مصاحبه نیمه ساختار یافته بود که از طریق آن مصاحبه ها با دانشجویان کارشناسی ارشد دانشکده آموزش پزشکی در مورد نرم افزارهای آموزشی مورد استفاده در تدریس به شیوه هدفمند انجام شد. طول مدت هر مصاحبه از 20 دقیقه تا یک ساعت متغیر بود، انجام مصاحبه با کل دانشجویان یک هفته به طول انجامید. مصاحبه ها تا رسیدن به پاسخ در سطح اشباع نظری انجام شد. سوالات مصاحبه برای دانشجویان بر اساس استانداردهای دست افزارهای یادگیری الکترونیکی که دارای معیارهای 5 گانه محتوا، ریایی، طراحی آموزشی، رسانه های آموزشی، و فنی طراحی شد.

یافته ها: نتایج نشان می دهد نرم افزارهای مورد استفاده در تدریس برای دانشجویان در دانشکده آموزش پزشکی از بعد استانداردهای دست افزارهای یادگیری الکترونیکی دارای کمترین تناسب را با معیارهای مورد بررسی هستند و مشکلات زیادی به ویژه از ابعاد محتوا، ره یایی و طراحی آموزشی در آن ها وجود دارد. وجود چنین مشکلات توعی در نرم افزارهای آموزش پزشکی، ناشی از مشکلات در رویکرد فن مدارانه و رویکرد آموزشی از جمله طراحی آموزشی است. این امر نشان دهنده ضرورت توجه به اصول طراحی آموزشی در تهیه و تولید این نرم افزارها است.

نتیجه گیری: این بررسی حاکی از آن است که توجه به اصول طراحی آموزشی در تهیه و تدوین نرم افزارهای آموزشی می تواند به عنوان یک رویکرد جدید آموزشی پاسخ گوی بخشی از نیازهای آموزشی بوده و کیفیت و اثربخشی آموزشی آموزش ها را افزایش دهد. تدوین نرم افزارهای آموزشی بر اساس الگوهای طراحی آموزشی یکی از چالش های اصلی یادگیری الکترونیکی و رمز موفقیت این سیستم آموزشی محسوب می شود. ضروری است سازمان ها و دانشگاه های مجری امر یادگیری الکترونیکی نیز به امر طراحی آموزشی و به کارگیری رویکردهای علمی جهت تحقق آن در اجرا عنایت ویژه ای داشته باشند.

واژه های کلیدی: آموزش پزشکی، تحلیل محتوای کیفی، طراحی آموزشی، معیارها و استانداردها، نرم افزارهای آموزشی، یادگیری الکترونیکی

التصميم التعليمي: الحلقة المفقودة من برنامج التعليم الإلكتروني للتعليم الطبي

الخلفية والهدف: يعد التعلم الإلكتروني أحد الأساليب الجديدة للتعلم في العصر الحالي، و للكفاءة في التعلم الإلكتروني من الضروري الانتباه إلى المحتوى الإلكتروني الذي يتم توفيره عادة من خلال البرامج التعليمية، إن عدم استخدام التصميم التعليمي في تصميم محتوى البرامج يعد أحد التحديات الرئيسية في التعلم الإلكتروني وفشل هذا النظام التعليمي. كان الغرض من هذه الدراسة هو فحص الحلقة المفقودة في التصميم التعليمي في البرامج التعليمية في بيئة التعليم الإلكتروني للتعليم الطبي. **الطريقة:** في هذا البحث، تم استخدام طريقة تحليل المحتوى النوعي. يتكون مجتمع الدراسة الإحصائي من طلاب المرحلة الجامعية في برنامج التعليم الإلكتروني في جامعة شهيد بهشتي للعلوم الطبية في مدينة طهران، وقد تم استخدام طريقة أخذ العينات المستهدفة لاختيارهم وتم اختيار 60 شخصاً كعينة. كانت أداة البحث مقابلة شبه منظمة، تم من خلالها إجراء مقابلات مع طلاب الماجستير في كلية التربية الطبية حول البرامج التعليمية المستخدمة في التدريس بطريقة هادفة، وتختلف مدة كل مقابلة من 20 دقيقة إلى ساعة واحدة، وإجراء المقابلات استغرق أسبوعاً واحداً لإكمال الطلاب. أجريت المقابلات للوصول إلى الإستجابة على مستوى التشبع النظري. تم تصميم أسئلة المقابلة للطلاب استناداً إلى معايير أدوات التعلم الإلكتروني التي تحتوي على معايير خماسية في التتبع، والتصميم التعليمي، ووسائل الإعلام التعليمية والفنية. **النتائج:** أظهرت النتائج أن البرامج المستخدمة في التدريس للطلاب في كلية التربية الطبية حول معايير معدات التعلم الإلكترونية هي الأقل ملاءمة للمعايير المدروسة ويوجد مشكلات عديدة وخاصة أعداد المحتوى، والتتبع، والتصميم التعليمي. ويرجع وجود مثل هذه المشاكل المتنوعة في برامج التعليم الطبي إلى مشاكل في منهج التكنولوجيا والنهج التعليمي، بما في ذلك التصميم التعليمي، مما يدل على الحاجة إلى الاهتمام بمبادئ التصميم التعليمي في إعداد هذه البرامج وإنتاجها.

النتيجة النهائية: تشير هذه الدراسة إلى أن الاهتمام بمبادئ التصميم التعليمي في تطوير البرامج التعليمية يمكن أن يكون نهجاً تعليمياً جديداً للإجابة على بعض الاحتياجات التعليمية وزيادة جودة وفعالية التدريب التعليمي.

يعد تطوير البرمجيات التعليمية على أساس أنماط التصميم التعليمي أحد التحديات الرئيسية للتعلم الإلكتروني ونجاح هذا النظام التعليمي. من الضروري أن تقوم منظمات التعلم الإلكتروني والجامعات بتصميم وتطبيق النهج العلمية لتطبيقها بطريقة خاصة. **الكلمات المفتاحية:** التصميم التعليمي، المعايير والمعايير القياسية، التعلم الإلكتروني، البرامج التعليمية، التعليم الطبي، تحليل المحتوى النوعي

تعلیمی منصوبه بندی : شهید بهشتی یونیورسیتی اف میڈیکل سائنسس کی میڈیکل فیکلٹی میں الیکٹرانیک تعلیمی سسٹم کا فقدان

ہیک گراؤنڈ: الیکٹرانیک میڈیم سے تعلیم حاصل کرنا آج کی دنیا میں تعلیم حاصل کرنے کا ایک ترقی یافتہ طریقہ ہے۔ الیکٹرانیک میڈیم سے تعلیم حاصل کرنا اس وقت میسر ہو سکتا ہے جب اس میڈیم کو عام نصابوں میں شامل کیا جائے۔ الیکٹرانیک تعلیم کے لئے سافت تیار کرنا نہایت ضروری ہے اسی وقت اس میڈیم کے ذریعے تعلیم حال کی جاسکتی ہے۔ الیکٹرانیک لرننگ میں یہ ایک اہم چیلنج ہے بالخصوص طبی تعلیم میں اس کا فقدان کافی محسوس کیا جاسکتا ہے۔

روش: اس تحقیق میں شہید بہشتی میڈیکل یونیورسٹی کے میڈیکل فیکلٹی کے پوسٹ گریجویٹ طلباء نے شرکت کی۔ ان افراد کی تعداد ساٹھ تھی۔ ڈیٹا کی جمع آوری شرکت کرنے والے طلباء کے انٹرویو سے کی گئی، اس انٹرویو میں میڈیکل تعلیم کے لئے استعمال ہونے والے سافت ویئر کے بارے میں سوالات پوچھے گئے، یہ سوالات مضامین، ٹریکنگ، تعلیمی منصوبہ بندی اور تعلیمی، صحافتی اور ٹکنیکل امور پر مشتمل تھے۔

نتیجے: اس تحقیق سے پتہ چلتا ہے کہ طبی مراکز میں طلباء جو سافت ویئر استعمال کرتے ہیں وہ کسی بھی طرح سے معیاری نہیں ہیں اور ان میں تعلیمی منصوبہ بندی، ٹریکنگ نیز مضامین کے لحاظ سے کافی مشکلات پائی جاتی ہیں۔ اس بات سے پتہ چلتا ہے کہ یونیورسٹیوں کو میڈیکل تعلیم کے سافت ویئر کو اپڈیٹ کرنے کے لئے فوری اقدام کرنا چاہیے؛

سفاارش: چونکہ آج کی دنیا میں میڈیکل تعلیم کے سافت ویئر سے تعلیم حاصل کرنا ناگزیر ہے اسی وجہ سے ملک کے طبی تعلیمی مراکز کو فوری توجہ کرتے ہوئے اس نقص کو دور کرنا چاہیے۔

کلیدی الفاظ: الیکٹرانیک میڈیم، سافت ویئر، میڈیکل تعلیم، یونیورسٹیوں

INTRODUCTION

E-learning is a wide collection of computer-based software applications and training, web-based tutorials, virtual classes, etc. Electronic learning is provided by computers through electronic media, the Internet, the web, organized networks, satellite broadcasting, hard disks, multimedia platforms such as CDs and audio and video tapes electronic learning is provided by computers through electronic media, the internet, the web, organized networks, satellite broadcasting, hard disks, multimedia platforms such as CDs and audio and video tapes and, in fact, e-learning is technology-based learning.

The capabilities of this tutorial are related to its educational creative methods, and it not only constitutes a new medium for distance education, but also as a kind of collaboration and partnership between the new model of new teaching and technology design that creates a potential context for fundamental changes in teaching and learning. Considering the benefits of e-learning and its special training capabilities, it seems that its integration into current campus programs, in a way that conventional training is presented in a combination of traditional education and e-learning, is unavoidable. E-learning is provided in a variety of ways, one of which is education through the use of multimedia and electronic content that is considered an e-learning variety (1). With the development of e-learning, educational software for this type of training has also been developed and diverse products have entered educational systems. Educational and educational assistance programs are usually available in the form of a "software program" (usable exclusively from a computer) and "educational videos" (available through a computer or DVD player). However; despite the expansion of these training collections, on one hand, some standards agreed by the majority of specialists in this area have not been designed and developed and there are very limited resources in this area. On the other hand, less attention is paid to such standards in designing and producing training software. There is no doubt that the content of the software and its design have a drastic role in achieving electronic learning objectives, so that producing electronic content, without considering special arrangements such as educational design patterns, jeopardizes its success (2).

Instructional design is recognized as both science and art. In fact, educational design is the framework for designing the design process and ensuring that learners' needs are met. The meaning of educational design depends on the background and theory of the individual (3). The educational design process involves independent stages including learner analysis, content and objectives, goals design, selection of strategies and evaluation tools, production of educational materials and assessment of learner performance, and assessment of the effectiveness of the instructional design (4). The educational design provides a framework for systematic design, development and adaptation of education based on the needs of learners and the content of instruction. Through the educational design process, teachers can assess the learners' needs, illustrate the

goal of the lesson, design the instructional content and do the assessment (5). The purpose of each type of design is to create an environment for each learner in which there is an opportunity for applying the whole capabilities of the students (6). The efficacy and effectiveness of the e-learning is in the flexibility of the instructional content design and considering the necessary educational standards in their design. Therefore, in order to create electronic content software, in addition to updating and improving the educational content, new methods and modules should be considered (7). Since the skillful role of educational designers is often the connection between concepts, unfortunately, the role of the training designer in e-learning is poorly understood. This is due to the lack of understanding of the e-learning needs and the complexity of the process. The correct design process in electronic content is a process that is put into learning development through learning, not technology at the learning development center (8). Nevertheless, in this research, standards were chosen for examining the software used in online classes, which included content standards, tracing and tracking, instructional design, educational media and technical. The present study, based on the above standards, examines a set of educational software from the perspective of students (60 students) of medical education faculty of Shahid Beheshti University of Medical Sciences.

As noted above, although electronic learning is possible in complementary ways, the most important form of these tutorials is twofold: a) CD-based; and b) network-based.

In the first place, the content designers put it in the form of compact discs. Often, these tablets include a curriculum vitae menu, a main menu, or a multimedia content list and content. The main advantage of these tablets is its ability to use without the need for internet access and the breadth of their use. In the second type, the content is designed to be loaded onto the server and the website address is given to the learners as the reference point for using its educational content. In the case of internet access, this kind of e-learning can be more effective. Because the internet network is much larger than the CD distribution network, and secondly, the ability to update educational content is much easier and faster. However, Internet speed and bandwidth are a deterrent to using this method, especially in developing countries.

The above-mentioned teaching methods are usually multimedia based on the sending of texts, pictures, educational speeches, exercises, examinations and maintenance of the results of the training course, including the grades and the most important ones. To complete this type of training, animations, simulations, audio-visual features, etc. can be used. Electronic learning is offered simultaneously or simultaneously. At the same time, all users log in to their account and communicate directly with each other. While in asynchronous training, communication is delayed, such as communication with e-mail (9).

The growing increase in access to hardware and software for e-learning has brought a new horizon to educational institutions. It seems that the use of these facilities for education helps to achieve the realization of some of the

aspirations that have been identified as quality education criteria, including: learning, lifelong learning, learning, interaction in learning and being multimedia. These educational institutions, both in the field of higher education and in the field of medical education, have, in recent years, taken a full range of training courses in electronic form through educational software, but there is still a lot of evidence about the results, Evaluation of these programs has not been published according to the required standards. This is especially true with regard to medical education, which has many contacts with a wide variety of interests, experiences and educational needs. The importance of changing in university education, along with the costly provision of e-learning facilities, especially the necessary software, shows the need for a more systematic and long-term approach to integrating e-learning into the current medical education system of the country. This approach requires creating scientific insights into the various aspects of e-learning and designing the change process based on existing conditions and logical aspirations in medical education. As this insight comes with the serious determination of the authorities and policy makers of the country's medical education, it is possible to take valuable steps to improve the quality of medical education and its more efficient use.

This approach requires creating scientific insights into the various aspects of e-learning and designing the change process based on existing conditions and logical aspirations in medical education. As this insight comes with the serious determination of the authorities and policy makers of the country's medical education, it is possible to take valuable steps to improve the quality of medical education and its more efficient use (10).

The purpose of this study is to investigate the Missing loop educational design in educational software in e-learning environments for medical education.

METHODS

The method of this research is to analyze the qualitative content of the deductive type. The sample of this study is chosen from the students of the e-learning course at faculty of medical education, Shahid Beheshti University of Medical Sciences of Tehran which the purposive sampling is used in selecting them and 60 students are selected in the end. The research tool was a semi-structured interview through which interviews were conducted with the students of the Faculty of

Medicine on the educational software used for teaching in a targeted manner. The duration of each interview varied from 20 minutes to one hour. An interview with the whole students lasted one week. Interviews were conducted to reach the response at the level of theoretical saturation. Interview questions were designed for students based on the standards of electronic learning equipment that has five levels of content, tracing and tracking, design, educational media and technical. The software used in the learning and learning process of the electronic learning system of Medical School of Shahid Beheshti University was studied with respect to standard criteria in the conceptual framework of content dimensions, tracing and tracking, designing, educational media and technical

To conduct the interview, a review of theoretical literature was initially developed, and general questions were formulated. Then he was interviewed with students. To select individuals, they proceeded in a targeted manner and continued until theoretical saturation. A total of 60 people were interviewed in this regard. The interview time was variable from 20 minutes to one hour. After completing each interview, the file was heard and converted into text, and for further interviewing, interview questions were modified and modified. Also, in the semi-structured interview process, interviewing the interviewee could be the basis for the next question.

Educational software standards provide standards for their effectiveness. Here we study the standards of content dimensions, tracing and tracking, educational design, educational media and technical (11).

In the following, we will examine the educational software used in the online medical education courses and, while answering the research questions, a sample of the analysis performed with respect to the various dimensions of the five. These examples, while demonstrating standards, standards benchmarks, provide a general overview of standards review in medical education software from the perspective of MA students.

Content aspect

Content is the most important part of the educational softwares. The e-learning educational softwares should have the right content and good organization, and at the same time provide a brief statement and presentation so that learners can learn the pre-defined content. Content aspect has 2 essential standards and the following 6 criteria are shown in table 1.

Aspect	Standard	Criterion	Result
content	accuracy	Accurate and precise	Criterion 1 – the content is accurate and precise
		Age ratio	Criterion 2- The content is appropriate for the target group's age and level.
		No bias	Criterion 3- Content avoids the bias and use of stereotypes, and focuses on implicit and indirect messages contained in writings and media (images, videos, etc.).
	Organization and Comprehensiveness	Logical organization	Criterion 1-Content syllabuses are logically organized.
		Fit with the title and duration of the course	Criterion 2- The content of the educational software is appropriate to the title and duration of the lesson and is adequate.
		Curriculum	Criterion 3- The curriculum covers the contents well enough.

Tracking aspect

An e-learning educational software should have appropriate tools for the learner's guide throughout the course so that they can effectively control their personal development. The tracking mechanism must protect the learner from any ambiguity and confusion among the various parts of the training program. This dimension has 1 standard, 2 standard and 3 criteria, as shown in table 2.

carefully selected, accurately identified and appropriately selected from learning pathways to enhance comprehension, and has strong interactions with appropriate evaluation and feedback. This dimension has 4 optional standards, which include a total of 12 criteria that are shown in table 3.

Educational Media Aspect

The effective use of educational media, the design of the user interface based on the principles of aesthetics, as well as the design and production of educational media and so on, will help promote learning and understanding of concepts. All in

Instructional Design Aspect

The design of the e-learning educational software must be

Table 2. Tracking and tracing aspect and standards and related criteria			
Aspect	Standard	Criterion	Result
tracing and tracking	tracking	Monitoring the progress	Criterion 1- The educational software provides the learner with a kind of learning that allows him to effectively monitor his progress.
		Ease of use	Criterion 2- Enabling and using the tracking elements is easy.
		Fit to learning level	Criterion 3- The visual icons, titles, and routing functions used in design are compatible with each other and are consistent with the common user habits and level of understanding.

Table 3. Instructional Design aspect and standards and related criteria			
Aspect	standard	criterion	Result
Instructional design	Instructional goals	Comprehensiveness of the goals	Criterion1-The educational software provides a comprehensive Instructional goals in a specific field. Criterion 2- The educational software correctly presents educational goals in all curricula. These goals are comprehensive and reflect the general educational goals of all software.
		Subcategory of General Objectives	Criterion 3- Software goals are not out of the reach of the overall goals
		Instructional Methods	Effectiveness on presentation
	A variety of methods		Criterion 2- The educational software uses more than two types of teaching methods to enhance learning
	Relationship with background knowledge		Criterion 3- Educational methods create links between the content of the course and the learner's previous knowledge.
	Practice and evaluation	Provide Practice and feedback	Criterion 1- The educational software is intended to help the learner to master the content of the course, practice and provide feedback.
		Possibility of formative assessment	Criterion 2- The educational software provides sufficient volume of content to achieve any educational goal.
		Conformity of the training with the goal	Criterion 3- Exercises and repetitions and formative assessments are consistent with educational goals.
	Coordination	Target and volume coordination	Criterion 1- The educational software provides enough content to achieve any educational goal.
		The ability to reaching the goals	Criterion 2- The content of the educational software is capable of achieving educational goals.
		The coordination of the goals, activities and assessment	Criterion 3- In general, educational goals, learning activities, and educational software measurements are consistent with each other.

all, in short, educational media refers to the use of moving images, animations, text, audio, images, photographs, or a combination of them to guide teaching or teaching content. This dimension has 1 essential standard and 2 optional standards, which include the total of 2 criteria that are shown in table 4.

Technical aspect

The next is the technical, educational media of the program software and hardware section. It goes without saying that if the course material is in violation of technical and software or cannot be run on a consumer computer, it will be useless to talk about the content and educational objectives, so one of the two standards related to the technical dimension is more important. Some of the essential standards are set. This

aspect has 1 essential standard and 1 optional standard and has 3 criteria as shown in table 5.

RESULTS

In tables 6 through 10, the matching of educational software with standards and criteria is reported from different dimensions.

As stated above, the purpose of the study was to investigate the missing loop of educational design in educational software in e-learning environment of medical education.

It should be noted that the results showed that the software used in the learning-learning process of the e-learning learning system of the Shahid Beheshti Medical School of Medicine was reviewed by considering the standard criteria mentioned in the conceptual framework

Table 4. Educational Media Standards and Related Criteria			
Aspect	Standard	Criterion	Result
Educational Media	Design and application	Promoting motivation and interest	Criterion 1- The use of educational media effectively increases the motivation and interest in learning.
		Help for getting the content	Criterion 2- The use of educational media effectively increases getting the content of the course.

Table 5. Educational Media Standards and Related Criteria			
Aspect	Standards	Criterion	Result
Technical	Ease of implementation and application	Ease of installation	Criterion 1- The educational software will run without problems on PCs.
		Ease of implementation	Criterion 2- The educational software will be installed and executed without problems in different environments.
		User-friendly	Criterion 3- The educational software is technically user-friendly.

Table 6. Matching educational software with existing standards and criteria from content dimension		
Aspect	Standard	Result
content	Accuracy and preciseness	Data analysis showed that the content of medical education educational software is not accurate and accurate. This can be seen in the comments of some of the interviewees. The interviewees of the codes 1,6,7,9,8,12,13,14,15,25,29,33,36,44,39 stated that the ((content contained within the software is not very accurate, and in some cases content errors There is a typo)). Interviewees also cited3, 6, 18, 28, 48,53,54,55, that they were not exactly aware of the goals of the course and did not know what the important subject was for the end of the course.
	Organization and comprehensiveness	Data analysis showed that educational software is not good organization and comprehensive. This can be seen in the comments of some of the interviewees. The interviewees of the codes 1,2,7,8,11,12,13,14,15,24,27,38,40,48,52 stated that ((the content contained in the CD is not set by the headings, and according to Needs and goals of medical education)). Interviewees also cited 7,33,11,17,22,23,24,33,57 that ((most of the contents of the software were presented theoretically and the content was kept paranormal, and the examples required for Content does not exist)).

section, which in five aspects of educational medical standards, Medical education software was not in a good position.

DISCUSSION

Educational software is an integral part of e-learning.

Table 7. Adaptation of educational software with the standards and criteria of the tracking dimension

Aspect	Standard	Result
Tracing and tracking	Tracking	<p>The results of the analysis revealed that the medical education educational software is not in desirable condition in terms of tracking and tracing. This can be seen in the comments of some of the interviewees. The interviewees of the codes 3.9,11,16,17,18,19,23,30,31,32,42,53,57,58 stated that ((the quality of educational software is not optimal because the implementation of the teaching materials of the century is very Time consuming)).</p> <p>Also, interviewees of codes 3.5, 11, 17, 20, 24, 28, 30, 36, 40, 41, 49, 38, 40, 44, said that the educational software has guides but this guide does not guide us in a correct way to different parts and there is no guide to the optimal use of the software.</p> <p>The readers of the codes 3,4,8,9,12,14,19,23,44,52 stated that ((there is no possibility of sticking in slideshows in educational software, and only moving from slide to slide is possible, even There is no possibility of interrupting the software.))</p>

Table 8. Adaptation of educational software to the standards and criteria of educational design

Aspect	Standard	Result
Educational Design	Educational Goals	<p>The results of the analysis of collected data indicate that the design of training objectives has not been done correctly in the design of medical education software. This can be seen in comments made by some of the interviewees. Interviewees reported the codes 1.5.8, 10.11, 12.13, 16.19, 20.21, 23.27, 39.41, 29, 31, 33, 32, 36.52, 55.56. ((There are several targeted educational materials for the educational software, but they are not complete and do not include all the content or the content of the CDs does not represent the primary goals)).</p> <p>The interviewees also included codes 1,3,4,5,7,10,11,13,14,17,19,20,23,25,29,30,31,32,35,39,43,44,49, 53,56,57,60 stated that ((most goals are in the cognitive domain and do not address the goals in the emotional or psychological domain of movement)).</p>
	teaching methods	<p>The results of the analysis of the findings indicate that in the design of educational software, various educational methods have not been used and all interviewees stated that ((the instructors who teach inside the software use only the lecture method in all educational content and various methods They do not use instruction and they only express the content. The only method of lecture is to offer one-way and passive teaching to the student)).</p>
	Practice and evaluation	<p>The analysis of the findings also showed that Practice and evaluation standards and educational standards have not been adequately addressed in the design of educational software.</p> <p>This can be seen in the comments of some of the interviewees. Interviewees 1,2,3,5,7,10,11,13,14,15,17,19,22,25,26,30,33,35,37,40,44,45,47,50,52,54,55,57,58,59,60, said that ((there are a few questions at the end of the software, but many of the questions put at the bottom of the software are wrong and some of my questions are with the content of the tutorials. Learning is not compatible, and when we respond to questions, we do not receive feedback on whether our response is correct. Because these are the final questions of the software and are not provided and answers during the training courses)).</p>
	Coordination	<p>The results indicated that the medical education educational software did not fit well. This can be seen in the comments of some of the interviewees. The interviewees of the codes 1,3,13,14,16,18,20,21,22,28,34,38,42,47,49,52,55,58,59 stated that ((sometimes educational materials inside the software were inaudible Or their volume is small and not fruitful. Sometimes the content is repeated several times, and there are too much content in some lessons, and we have no opportunity to study all of them and only read them. We do not learn the content well, and after the exam, we forget everything)).</p>

Table 9. Compliance of Educational Software with Standards and Criteria from Educational Media		
Aspect	Standard	Result
Educational media	Design and application	The analysis of the research findings suggests that the educational software in the field of medical education is not well designed and applied. This can be seen in the comments of some of the interviewees. Interviewees of the codes 1,2,3,8,9,13,14,15,18,19,22,20,23,28,33,36,37,40,54,56,57,60 stated that ((the content Software is just text and is the only facial image of the course professor who teaches lectures and has no appeasement within the software)). Also, interviewees of codes 2,3,9,7,11,12,16,17,20,21,25,29,30,32,34,16,54,58 stated that the problems involved in the preparation, installation and use There are educational software available to eliminate the student's motivation and interest for complete use and study. Apps are text-centric and have little features, and it's not even possible to slide back and forth, and only slides to slides are possible. All the interviewees stated that they do not have the quality of educational software in terms of color and educational environment, and sometimes there are some definite sound and slides for some reason.

Table 10. Compliance of Educational Software with Standards and Criteria from Technical Issues		
Aspect	Standard	Result
Technical	Ease of implementation and application	Failure to adhere to this aspect is one of the drawbacks that were evident in the results of the analysis of the findings and showed that the educational software does not have the ease of implementation and desirability in technical and standard terms. This can be seen in the comments of all interviewees. ((There is usually no CD to the number of students, and sometimes it takes time to reach the students, and when it comes to us, it usually crashes, and often does not open at all, and when opened, the software format may be formatted in the system. Student is not familiar with the installation, and if it does not fix it, it has a long install time and the installation process is very difficult and has different stages. After installing it, it's hard to use because of the lack of guides for the different parts, and ultimately we're going to dominate it with the test and error and understand how to use the material)).

Therefore, the idea of implementing e-learning is increasing day by day, so it's sometimes difficult to choose the software you need from a huge collection of them. In such a situation, the availability of software is necessary from the minimum standards and educational standards. The results show that the software used in teaching for students at the faculty of medical education on the aspect of standards of e-learning educational media has the least proportionality to the criteria studied and there are many problems, especially content dimensions, Tracing and tracking and Educational design. The existence of such a variety of problems in medical education software is due to problems in the technology-based approach and educational approach, including educational design. Perhaps it can be argued that educational software providers are mostly software engineers and are not well informed about the principles of software development, in particular the ways of the educational design. Amir Teymouri calls this Disadvantage a "skill-oriented" approach. He believes that the examination of multimedia educational software shows that their more productive approach is more skilled than training. They used these media solely for the transmission of information, not as a communication tool for the exchange of effective educational messages (12). The study also suggests that

paying attention to the educational design principles in the preparation and development of educational software can be a responsive part of educational needs as a new educational approach and increase the quality and effectiveness of educational, training. Educational software development based on educational design patterns is one of the main challenges of electronic learning and the key to success of this educational system. Educational content is part of the data with specific components and relationships designed to enhance the level of knowledge and skilled learner. Since the use of educational design strategies and techniques in the production of electronic and multimedia content in the production of electronic and multimedia content is significantly related to the learning and motivation of medical students, it is essential that e-learning organizations and universities conduct Designing educational materials and applying scientific approaches to it is of special interest. Since medical universities in addition to providing health services to people, it is important to train skilled human resources and specialized specialists in different sectors of society. This requires that the medical education is continuously reviewed and strive to promote it through educational design patterns. Students, professors, educators, educational content, educational methods, educational

resources, the growing trend of educational technology and e-learning are among these factors. Therefore, considering the effectiveness of multimedia education in learning without reducing students' satisfaction and memorization, it is better to include this new method as part of the training in the curriculum of universities, especially medical science universities. On the other hand, medical science universities need to thoroughly develop their e-learning education in order to achieve the vision of the system and its effective presence on international arenas (13). In this situation, it is necessary to create monitoring systems and monitor the quality of the electronic learning system, including software. This is a necessity for software that ultimately leads to the classroom. Among all the factors mentioned above, it is suggested that the implementation of e-learning courses and the designers of these courses should be used in designing the production of electronic content in educational software using behavioral design, cognitive,

and constructivist design patterns.

Also, the provision of in-service courses and workshops in order to become familiar with educational design patterns, especially constructive educational design patterns for designers and e-learning professionals, can be effective in this regard.

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