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# Exploring the components of student support system in blended learning for Iranian Universities of Medical Sciences: A thematic analysis

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## Abstract:

**BACKGROUND:** Support services are a very important element for all educational institutions. The aims of this study were to explore the components of the student support system in blended learning for universities of medical sciences in Iran.

**MATERIALS AND METHODS:** The present study was performed qualitative with exploratory approach. The tool used to collect data was a semi-structured interview, after conducting interviews with 17 e-learning experts and specialists of universities of medical sciences, we reached information saturation. The study was conducted at Aja University of Medical Sciences in Tehran in 2020. Data analysis was performed as Thematic Content Analysis by Attride-Stirling method.

**RESULTS:** From the content analysis of the interviews, 6 main themes and 19 sub-themes were obtained. Main themes included “Scientific- cognitive Support”, “Systematic Support”, “Human Resource Support”, “Emotional Support”, “Technical Support” and “Financial- economic Support”.

**CONCLUSION:** Based on the results of this study, 6 basic components and its subcomponents of the student support system were obtained. It is suggested that the educational officials of medical universities with blended learning use the results of this study in setting up their student support system for academic success in e-learning and medical students.

## Keywords:

Support system, blended learning, qualitative research, student, Iran

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## Introduction

Contemporary education, based on the distant Information technologies (IT), goes beyond the national boundaries, transforming into an open space, providing the opportunity to obtain high-quality education for anyone around the world, regardless of its location and accommodation. At the same time, it is an additional opportunity for each country to declare itself in the international environment, spread its cultural and political influence, and increase their competitiveness.<sup>[1]</sup>

Blended learning is the integration of an online and face-to-face learning experience and online interactions using appropriate Information and Communication Technologies (ICTs).<sup>[2]</sup> In recent decades, blended learning has become increasingly important in academic education. Online learning as a preparation for face-to-face training sessions has many benefits: nowadays, it is easily accessible anywhere and anytime, and students can learn at their own pace and start and follow the course.<sup>[3]</sup> The results of studies show the effectiveness of blended learning compared to traditional face-to-face training and fully online training

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for health professionals. It has been shown that blended learning is more effective in utilizing knowledge than face-to-face learning and fully online learning.<sup>[4]</sup> Distance education (DE) in definition means education using technology. In these educational systems, technology is used to design instructional system for students who are not physically present in a traditional class or university and have distance learning.<sup>[5]</sup>

Krishnan (2012) defines student support services (SSS) as a set of facilities and activities to make learning processes easier and more interesting for the learner.<sup>[6]</sup> Despite the strategic role of distance education universities in providing access to higher education, these universities face many challenges. One of these challenges is the lack of proper support for the learner. Many learners in this field believe that providing appropriate support services will increase the quality of their learning. One of the most important factors in distance learning and e-learning is paying attention to the student support system. The results of various studies have shown that the use of appropriate support leads to the success of virtual learning systems in schools or higher education.<sup>[7]</sup>

The results of a research study by Nurmukhametov *et al.* have shown that in order to have a quality education, it is necessary to pay attention to the monitoring support service, software and Internet access, their management, creation of digital educational resources, automation of management analysis monitoring system, and finally, specialized training of teachers and staff.<sup>[1]</sup>

Kumtepe *et al.* (2018) stated that one dimension of student support in distance learning is to create a positive interactive environment between the learner, faculty, and staff. The researchers said that this positive integration could be a successful model for effective teaching and learning. Therefore, all individuals and structural resources in the DE system should be considered an integral part of support services.<sup>[8]</sup>

A study by Chatpakkarattana in Thailand emphasizes that learner support systems should include pre-, during, and postgraduate students, and the study emphasizes the role of these systems in student academic achievement.<sup>[9]</sup>

Allama Iqbal Open University is the first distance learning university in South Asia to teach about 1.3 million students for a year. The university has a support system to support students' learning, which is being developed using the latest open-source technologies to gather all the student questions on a single platform for optimal data analysis and quick answers. In other words, interaction and personal support services at the university have become a platform that includes both individualism (interaction with the individual

and their own learning systems) and intrapersonal interactions (learner-learner, learner- teacher, learner-content/materials/interface, etc). Supporting services here include not only learner-oriented learners but also all stakeholders in the system including faculty members or academic staff who are responsible for producing and delivering educational content. Administrative personnel are responsible for administrative processes and technical personnel are responsible for technical work in the system.<sup>[10]</sup>

According to studies, SSS in DE is generally actions taken by DE institutions to facilitate students' learning and reduce the disadvantages associated with distance learning. Therefore, DE institutions try to provide guidance and counseling services to students, course content, face-to-face tutorials, library resources, and many other services to strengthen information and administrative systems effective in the teaching and learning process.

A review of available information sources shows that despite the theoretical background, no research has been done on the student support system in blended learning and e-learning in Iran. Therefore, due to the importance of the subject, the present study was conducted to investigate the components of the support system of medical students in a blended learning from the perspective of experts in Iran. The results of this study can be applied to Iranian universities of medical sciences that have blended and virtual learning. It is important that these universities pay attention to the dimensions and each component of the student support system in setup of virtual and blended learning courses.

Given the importance of the subject and the lack of research in Iran on the student support system in e-learning, this research aimed to explain the components of SSS in blended education in medical sciences in Iran from the perspective of experts. This study was necessary because blended education is becoming popular in Iran, and SSS plays an important role in its development. The results of this study are vital for universities to consider the components of the support system that should be given greater emphasis and improvement to ensure a higher level of satisfaction and academic success among learners.

## Materials and Methods

The present study is a qualitative study. The study was conducted at Aja University of Medical Sciences in Tehran, Iran, in 2020. Semi-structured interviews were used as data collection tools. The validity of the interview questions was confirmed by three experts. This method allowed the interviewer to examine the topic in

greater depth Interviews with experts participating were conducted in two ways. A number of people who were in Tehran were interviewed in person or face to face and a number of other professionals who lived in other cities were interviewed by telephone because of the distance. Sampling was performed purposefully in purposeful sampling in qualitative studies, the researcher selects as an example for herself those who must help to understand the research issues and the process of its interpretation and have a key role in this regard after obtaining the preliminary samples, and the samples introduce other people to participate in the research.<sup>[11]</sup> Interviews were saturated data with 17 professors and experts of e-learning in the field of medical education at Iran University of Medical Sciences. Participants in the interview were from Tehran, Shahid Beheshti, Iran, Isfahan, Shiraz, and Iran Virtual University.

The main questions of the interview were:

- What do you think the concept of medical students' support system in combined education means?

What is your opinion about the importance and necessity of the support system of medical students in combination education compared to face-to-face education?

What abilities are required in the staff and professors and combined education experts to provide support and support to medical students?

What are the dimensions and components of the student support system in combined learning and teaching?

The interviews were conducted after coordination with individuals and their satisfaction with participating in the study. The interviews lasted about 30–45 min, depending on the interaction between the participant and the interviewer. Face-to-face interviews were conducted at the interviewee's workplace and in a quiet environment. All interviews were recorded, and each word-for-word interview was typed carefully. Thematic analysis was started after the first interview; in addition, coding and categorization work began after two interviews. Inductive content analysis defined by Attride-Stirling method was used by following data transcription.<sup>[12]</sup> Data analysis was started after the first interview; in addition, coding and categorization work began after two interviews. According to Attride-Stirling, content analysis has three main stages:

The thematic analysis method was used, including familiarity with the data (implementation of interviews, reading and re-reading them, which led to the writing of initial ideas) and generation of initial codes (data are systematically encoded throughout the data set), and

this was a constant back-and-forth between the codes extracted from the text of the interviews and the new data (new interviews), and the data from the text of the interviews were encoded in several steps to extract the most concise categories that are understandable at the same time. The next step, the codes from the previous step were merged based on similarities and finally classified into categories and sub-categories based on similarities and differences. This process is shown in Figure 1.

Based on the evaluation criteria introduced by Lincoln and Guba,<sup>[13]</sup> the study data were used to evaluate the data, which are credibility, transferability, transferability, and confirmability. In this study, the credibility of the qualitative findings was ensured using member check. In order to ensure the accuracy of the data, the people who had the experience of conducting qualitative research were asked (peer check) to review the initial interviews, coding, and categories.

In this research, moral considerations (satisfaction, the reason for recording of interviews, and confidentiality of the identity of the interviewed person) are observed in this method. The study was approved by the Ethics Committee of Iran Medical Affairs Strategic Research (970252). All of the participants were informed about the objectives of the study, and the participation was voluntarily in the study.

## Results

A total of 17 experts have been participated in the interview. The mean age of interview participants was  $48.82 \pm 5.97$  years. The participants in the interview were 5 males and 12 females.

The results of the interviewees' analysis on the definition of the student support system in blended learning and

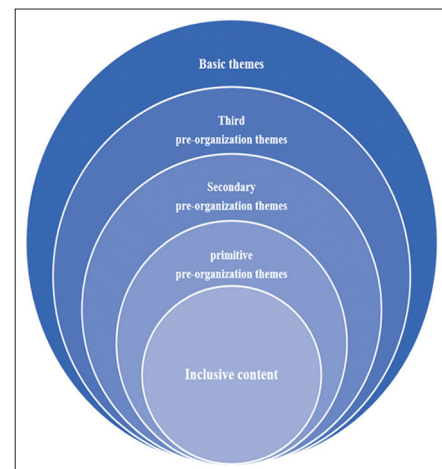


Figure 1: The process of content analysis

its necessity in comparing to the traditional education system showed:

Support system as a purposeful system by providing support and service conditions in all cognitive and metacognitive dimensions according to the time and place conditions that are appropriate to the needs and conditions of the learner from the time of entry, during the study to after graduation with systematic support and guidance. Guidance facilitates the learning process of the learner, which leads to the effectiveness of the teaching process and ultimately the academic success of the students.

- All interviewees pointed out the need for a student support system in each training, both traditional and virtual learning. However, they emphasized the importance and necessity of the student support system in the virtual and blended learning of medical sciences compared to face-to-face training and traditional education.

In total, 618 primary codes were extracted. After reviewing several times, the codes were summarized and classified into 6 main categories and 19 subcategories based on similarity and appropriateness, which are listed in Table 1. The result of this study was six primitive preorganization themes (theme) as follows: "scientific-cognitive support," "systematic support," "human resource support," "emotional support," "technical support," and "financial-economic support."

A concept map of 6 main themes and sub-themes has been drawn with the help of Mxqda software [Figure 2].

**Table 1: Themes and subthemes extracted from the interviews**

Themes	Subthemes
Scientific-cognitive support	Content of curriculum Learning strategies Evaluation Library support Educational well-being
Systematic support	Support systematic model Administrative support Management support Legal support
Human resource support	Teacher support Staff support Interactive support
Emotional support	Psycho-cognitive support Advisory support Cultural support
Technical support	Technical infrastructure Physical support
Financial-economic support	Economical education Financial support

### Scientific-cognitive support

This primitive preorganization theme (theme) includes 5 secondary preorganization themes (categories): (1) content of curriculum, (2) learning strategies, (3) evaluation, (4) library support, and (5) educational well-being and 12 third preorganization themes (subcategory) [Table 2].

Curriculum content, how to design curriculum content and curriculum content present. One of the important components in the design of blended learning by the participants in the study of educational content was that if properly designed can support the learner in successful and effective learning.

*P7: "The content should be user-friendly, the principles of content design should be observed, the view that professors and students have of the content."*

*P10: "In this support system, they design the content in such a way that the content is flexible and they can move forward with their own strategy."*

Learning strategies are referenced according to learning styles, student-centered learning, attention to the nature of the learner, and the use of space and various learning resources. Learning style includes the beliefs, convictions, priorities, and behaviors that people use to help them learn in a given situation. The teacher's attention as an educational designer to students' learning styles in virtual and blended learning, like other learning methods, can pave the way for sustainable, deep, and rich learning.

*P2: "Educational psychology is where we come to pay attention to students' styles, that is, if we want to have a successful education, we will see which of our students are verbal and which are verbal. It is important to know the Student's learning style and to plan and work according to the Student's learning style."*

Assessment from the point of view of the interviewees in the study plays an important role in the mentioned support system in virtual and blended learning as in any other education. From their perspective, two important aspects of evaluation include assessment and providing effective feedback to the learner and the learning system.

*P3: "The evaluations that are done should be from different angles, and the feedback should be quick and forward and backward and backward. Sometimes when I take the exam myself, I define four things only for them and now I am going in that direction. They learn and I get feedback, but sometimes I ask management questions in the evaluations. Now you were the director. What did you do? Sometimes I look at them from the Student's point of view. The evaluations should be*

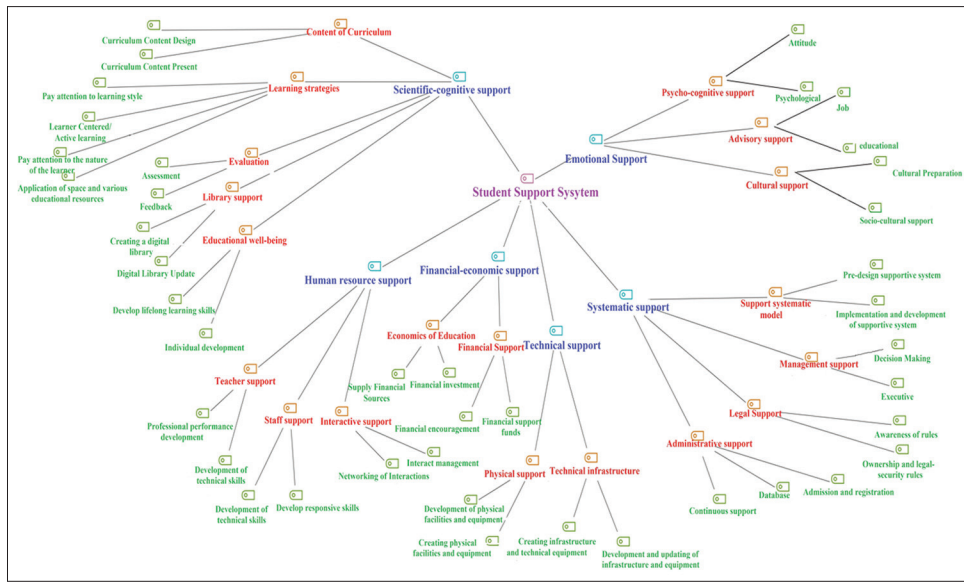


Figure 2: Conceptual map of the themes

so practical that the Student’s analysis should be measured. The student has started.”

One of the components emphasized by all participants in this study was library support and the possibility of accessing a variety of educational content via the Internet offline or online. In category of library support, the creation and updating of a digital library is a major concern, and ultimately, the educational well-being category with two subcategories of develop lifelong learning skills and individual development emphasizes supporting students in combined medical science education. The main feature of e-learning is the provision of learning and teaching activities, especially the delivery of learning content in a digital environment. Unlike traditional libraries, digital libraries can provide students with library services and resources over the Internet, regardless of space or time constraints, to support the e-learning process.

P7: “Let’s teach him different strategies. How should you take notes? How can you be sure that you actually learned it? Let’s teach him different teaching skills and give him things. In fact, his metacognition should be strengthened. Meta cognitive is that all of this is part of student support “.....” How to become self-directed learning, how to make meta-excells and metacognitions actually something, all of these can be put together in one aspect.”

### Systematic support

Most of the participants agreed that there should be a pre-designed model for virtual education systems and student support in the university and educational institution, in which attention should be paid to the implementation and development of the learner support

system. Analysis of interviews was obtained under the components of a systemic support system including four categories:

1. Support systematic model includes predesign supportive system, implementation, and development of supportive system [Table 3]

P15: “... to know our environment, our students and our field of study. Then let’s get to know our own model, and these are very important to design that particular model. In addition, let’s see what models are now in the world and read, even do a pilot of the method, and then we can bring our personal model.....”

2. Administrative support includes admission and registration, database, and continuous support. One of the factors that directly affect learning and quality in e-learning systems is the managerial and administrative component. This support also includes student registration and admission, relevant and appropriate information about curriculum and the schedule of educational program and student support by introducing and accessing them to the university educational networks

P13: “There are a number of factors at the pre-virtual or pre-combination training stage, such as informing the student, registering the student’s name, and actually training the student.... Support can be on Policy making, and you can provide a series of available guidelines, to students.”

1. Management support with two subcategories: Decision making and executive

P5: “In order to run this story smoothly, I have to say in advance that we must first be the most complete managers and policymakers to know what Blended learning is...and what is necessary and why are we talking like that? When they are

**Table 2: Codes, subcategories, and categories derived from the scientific-cognitive support theme**

Secondary preorganization themes (category)	Third preorganization themes (subcategory)	Basic themes (code)
Content of curriculum	Curriculum content design	Interactive content design/pay attention to the needs of students' new generation in content/content flexibility/observance of principles in content design/problem-based content design/consult with learners in content selection/content production with student participation/using different content design models/using a specialized team to support content/team working of instructors in content design/interdisciplinary team in content design/paying attention to the nature of courses and disciplines/attention to learners' needs/analysis of the virtual, face-to-face and combination parts in the lessons/appropriate goal setting for technical facilities and training courses
	Curriculum content present	Specifying the composition of the content presentation in the form face to face and nonface-to-face/providing lesson-related practical examples/how to present and arrange content/provide content tailored to learners' needs/coordination between content provided/learning activities at home/continuous presentation of content online or offline to students/consider combining supplementary resources/provide content guidelines for students
Learning strategies	Pay attention to learning style	Application of various educational styles/pay attention to different learning styles of learners
	Learner centered-active learning	Student-centered growth/to give direction to learners/guide students to achieve learning goals/provide group discussion among learners/holding meetings questions and answers with students/open space for classroom questioning/critical learning/analytical learning/learning exploratory learning development/collective learning/using different theories of learning/consulting learning/participatory learning/creating intellectual rainfall/creating meaningful learning/learning during action/active learning/variety in teaching methods/use different combination of learning models
	Pay attention to the nature of the learner	Learning fit with learners' learning speed/attention to students with poor performance/cognition of learners/personalizing student learning
Evaluation	Assessment	Variety of study resources/use and application of all messengers in the training process/using educational videos for students/use of advanced technologies/existence of discussion forums/creating a fun space for students to learn/creating space for discussion and students/creating space learning in virtual network
	Feedback	Proportion between course topics and exams/application of evaluation methods from different learners/continuous assessment during the course of learners/assessment of learner satisfaction/teacher satisfaction assessment/self-assessment/using formative assessment/using a combination of evaluation methods/applied appraisal appropriate to learners' performance/student survey/internal structure assessment/evaluating the efficiency of training/efficiency and effectiveness of technical system support
Library support	Creating a digital library	Pursuing student learning activities/providing feedback for students/providing feedback for professors/providing feedback to evaluate the effectiveness of training for officials
	Digital library update	Creating a digital library/providing book sales services and digital library to students and faculty members/ability to access electronic resources
Educational well-being	Develop lifelong learning skills	Update electronic resources and books and digital library
	Individual development	Improving self-management skills for students (such as time management)/increasing study skills for students/developing student entrepreneurship ability/cognitive counseling/self-efficacy learning skills/self-regulation in learning/attention to critical thinking/strengthen self-learning
		Student personal development/workshops on technical empowerment of students/long-term plans to empower students/development of previous readiness student presetting the developmental summer courses for students/workshops for student development

fully justified, then the necessary conditions and context are created."

2. Legal support includes ownership and legal security rules and awareness of rules. In blended learning environments as a method of distance learning, compliance with copyright laws is very complex and requires great care. Plagiarism on the Internet is easy and information is plentiful, so the issue of copyright is more important. In blended learning environments as a method of distance learning,

compliance with copyright laws is very complex and requires great care. Plagiarism on the Internet is easy and information is plentiful, so the issue of copyright is more important. Familiarization of students with these laws and intellectual property rights as a supporting component of the e-learning system is important. It is clear that in virtual learning environments, such as traditional environments, the behavior of educators and teaching staff in the lawful use of resources demonstrates a pattern of behavior

**Table 3: Codes, subcategories, and categories derived from systematic support theme**

Secondary preorganization themes (category)	Third preorganization themes (subcategory)	Basic themes (code)
Support systematic model	Pre-design supportive system	Recognizing existing models in the world and model world experiences/designing system suitable for indigenous conditions/designing systematic support processes/presentation specific definition of support system/editing objectives for the support system/accurate conceptualization of support system/consulting experts in design/fit designing system with course content/designing systems with the presence of educational assistants and supervisors/designing systematic theoretical foundations for the system/designing system structure for the system/have a proper understanding of the system/consider the desired learning environment in the design/proportional with global standards/personalize a model based on environmental and background conditions
	Implementation and development of supportive system	Feasibility to implement the system/flexibility and system adaptability/providing different platforms for design and implementation/development system/specify expectations from the support system/prioritize support programs/justification of managers from the necessity of its design/supporting from the technical and scientific achievements of students/diversification to student support system/use the collaboration capacity of different parts of the university to implement
Administrative support	Admission and registration	Student academic support over time register/student support in deleting and adding, selecting courses, etc./determining students' job descriptions during the course/providing educational services especially for students with disabilities
	Database	Create database from student information/formation centers of graduates
	Continuous support	Offering online and offline support/precourse support-during the course, after the course/continuous support for students while studying/continuous communication of graduates with the university/provide opportunities for students to collaborate as interns in various organizations
Management support	Decision making	Pay attention to policies and long-term planning/having superior support/determining the mission and organizational leadership/drawing a vision/provide a clear vision and roadmap for students' abilities and needs (roadmap)
	Executive	Specialization in hiring faculty members/separation of virtual and nonvirtual education departments/balance in teacher-student ratio/pay attention to the ratio of employee to student/design guidelines for using the system/employing a specialized team in support/providing technological guidelines to students/designing specific technical guidelines for students/employing university vice-chancellors/development of university employment contracts with companies/facilitate processes/efficient management
Legal support	Ownership and legal-security rules	Introducing the issues of intellectual property rights/observance of ethical principles in education/observance of ethical principles of activity in online environments/management and information security/save privacy
	Awareness of rules	Clear and accurate information of university regulations/sharing rules and regulations of university/provide comprehensive information from teachers/information on ways to communicate with the university/informing the hours of classes, how to score, etc./transparency of administrative system/information about university/facilitate rules of educational regulations/development of new rules and regulations

for learners. Their adherence to intellectual property rights and publishing rights will lead learners to learn this ethical principle.

*P16: "... especially about moral debates, we have to pay attention to them, we have moral debates both in person and in absentia. It is possible to have more appropriate context for violations only in non-attendance spaces. Either we pay attention to our support can keep the student alert....Or we support them in some places to implement a series of rules in some places, that it needs instructions, regulations, and so on."*

*P1: "... Learning in this environment, in addition to technical functions and a content access, copyright ethics ethical functions and a lot of that because the student didn't get the*

*information that he or she needed at the beginning. I think all of this is kind of in students support."*

**Human resource support**

Human resources are always considered as one of the most important assets of an organization, and not paying enough attention to it can impose a lot of costs on the organization. One of the most important components of a learner support system is human resource support. Human resource support theme includes three categories: teacher support, staff support, and interactive support [Table 4].

1. Teacher support includes development of technical skills and professional performance development. One of the most important factors for the success of

**Table 4: Codes, subcategories, and categories derived from human resource support theme**

Secondary preorganization themes (category)	Third preorganization themes (subcategory)	Basic themes (code)
Teacher support	Development of technical skills	Cognition and awareness of teachers in the field of virtual education/having the knowledge of virtual teaching of faculty members/improving the ability of professors to use electronic tools and various teaching aids in blended education/updating the scientific knowledge of professors in the field of blended education/increasing previous readiness teacher/increasing teacher's interest in using tools/applied knowledge in the field of technology
	Professional performance development	Development of faculty teaching skills/development of faculty communication skills/ability to transfer information/clear expression/teachers believe in this type of learning system/previous experience/professional knowledge/ability to generate content/content segmentation and heading/knowledge of various learning resources/master's availability/having a lesson plan at the beginning of the semester/using the mentoring method to synergize the experience of faculty members/students responsibility/to be compassionate/being consistent/commitment/competence/flexibility in training/liquidity/conscientiousness/interest of the master
Staff support	Development of technical skills	Improving IT knowledge of experts/holding conferences/participating in virtual training courses
	Develop responsive skills	Continuous and full-time response of the technical team to the problems of students/empowerment commensurate with human resource needs/empowering human resources before entry/use of specialized workforce/providing knowledge and skills development workshops/empowering experts during service
Interactive support	Networking of Interactions	Developing students' relationship with content/creating bilateral and (multilateral) interactions/continuous student communication/creating workgroups among students/developing interactions between students/developing teacher-teacher interaction/developing teacher-student interaction/paying attention to the interactive space (between teachers and learners and learners together) in designing curriculum/continuing communication with graduates/space for students to learn from each other
	Interact management	Organizing interactions through electronic tools such as podcasts/organizing communications in the system/developing interactions through various messengers such as email and social networks

universities with virtual training of teachers is what skills they know and teaching and research are its teachers. To support them, a support system needs to know what skills they need to teach successfully online. Providing support for teachers' professional development helps them succeed in an e-learning and learning environment

P17: "... A major part of it is that the people who are going to provide these services have one that they have experienced special training and that they themselves have the capabilities needed to work with the virtual system so that they can transfer.....Part of it, if possible, is Orientation for teachers, what does the virtual system expect from children... Teacher training that should also have content knowledge, Have virtual teaching knowledge.... Virtual teachers need to know the curriculum well, know instruction design, and know content knowledge well enough to be able to convey content through this system."

P7: "He must know the role of e teacher; he must learn that the empowerment of faculty members is ultimately an important part. In addition, the very characteristics of the master himself can be adapted to this environment.

2. Staff support with subcategories: Development of technical skills and develop responsive skills. Staff

knowledge and skills are very important in providing the required services and supporting learners in virtual and e-learning. Lack of IT training and skills, lack of knowledge and information about e-learning, and staff lack of motivation were the most important obstacles to e-learning and the weakness of a student support system from the perspective of experts in this study.

P16: "The employee who provides the service in absentia training, I have to obtain this complete knowledge and skill to be able to help others and To have this view..... The employee of the system should know that the type of services that may be provided should be wide-ranging and he should have enough knowledge and skills in this field."

P10: "Definitely a technical team that can solve technical problems regularly, because technology has its own problems anyway. A responsive ethnical team is a team that must be available for all the time, for example, on the time that student can't see his file, or can't download or upload it, and the time that he or she have question and problem that should be answered."

3. Interactive support includes two subcategories: Networking of interactions and interact management. Interactions in distance learning and blended learning



systems include learner-to-learner interaction, learner-to-content interaction and learner-to-teacher interaction.

P15: "One of the cases is the amount of interaction between teacher and students, which is one of the important indicators of quality..... In addition to interacting, the learner, he or she should be active and form his/her cognitive structure by interacting with other students, his/her teacher, and content."

**Emotional support**

Emotional support includes behaviors, attitudes, respect and concern and interest in students, appreciation, recognition, fair behavior, encouragement, and listening. In this study, experts listed emotional support as one of the important components of the student support system in virtual and blended learning. Emotional support theme includes three categories: (1) psycho-cognitive support, (2) advisory support, and (3) cultural support. Psycho-cognitive support refers to attitude and psychological. Advisory support addresses the job and educational support required for students in the blended learning in medical education system. Finally, the cultural support refers to cultural preparation and sociocultural support [Table 5].

P13: "I think students need support emotionally. Students also need to be given some psychological counseling, for example, their psychological well-being and the motivational support they need to be given..."

P10: "We also want a team that can mentally prepare students and relieve their stress, for example, I remember last summer when it was a virtual training course and these students had a terrible stress about what to do?..."

P1: "... An in-person student or a virtual education student needs to enter the university Because you are faced with a different environment, you need to be familiar with the environment in which it enters Now, legally, the things he can do, the extracurricular activities, all of which should actually be available to him, there is someone who can refer to him if he has any questions.....We have a professor of academic counseling who can provide support for what you can do now, for example."

P5: "Students aren't ready for their main life; therefore, I think about this story and the support can play a role in that part of their lives for their private lives... Empowering them so that they can be citizens is all that can be thought of."

P2: "A debate is a social debate that has to deal with social debates, each of which has its own components. Of course, I think they are all interdependent, and if he wants to get the right support, we have to look at the social, psychological, and economic components. So that we can have an effective training. Identifying cultures is important that we get involved them so that our students can use and enjoy this training."

**Technical support**

One of the important components in creating and developing e-learning and combined learning is hardware infrastructure and software infrastructure, and the necessary condition for the development of hardware infrastructure is the provision of the necessary facilities for communication and connection to the Internet or intranet network. According to the experts in this study, technical support theme has two categories: (1) technical infrastructure includes two subcategories – a. Creating infrastructure and technical equipment and b. Development and updating of infrastructure and

**Table 5: Codes, subcategories, and categories derived from emotional support theme**

Secondary preorganization themes (category)	Third preorganization themes (subcategory)	Basic themes (code)
Psycho-cognitive support	Attitude	Emotional support for the teacher/emotional support for students/increase student confidence/support for gender issues/behavioral improvement/changing the attitude of teachers and students towards virtual and combination education/attention to students' beliefs and attitudes/consider valuable issues/increase student s' motivation/increase teachers' motivation
	Psychological	Psychological and mental health counseling/provide psychological counseling to students (to control anxiety and stress, etc.)/attention to students' psychological issues/auxiliary system based on the needs of students
Advisory support	Job	Provide job recognition guidelines/attention to students' job skills/providing services and career counseling
	educational	Providing lesson advice/provide guidelines before choosing a field (academic knowledge)/introducing the introductory course for students/promoting students' knowledge of the course/provide private education to students
Cultural support	Cultural preparation	Creating a culture in society (accepting virtual education)/cultural context in universities/cognition and planning appropriate to cultural conditions, customs
	Sociocultural support	Attention to cultural diversity/support for cultural issues/attention to social class differences learners/attention to life skills development/attention to students' social issues/responsible citizens

equipment and (2) physical support refers to creating physical facilities and equipment and development of physical facilities and equipment.

P4: "The technical and IT part is a part that is in the platform as Default, but of course this is in the system. Students are told to be empowered, the LMS system itself is embedded in them, in fact in that help their disks and guidelines and guides are placed depending on the suitability of the students...."

P 6: ".... There should be a discussion of dormitories and facilities in dormitories. Prepare these preparations for the public spaces that students use. We have to have the necessary minimums, whether in libraries, pavilions or dormitories..."

P8: "..... What's his class like, his commute, where they sit, the quality of the heating and the cooling of the air... In order for this to happen and for you to have good support and for blended education to be good and for your students to be ready, these conditions must be provided for them..."

### Financial-economic support

Based on the opinion of experts in this study, financial-economic support includes two categories: (1) Education of economics and (2) Financial support.

Resources include support units including legal aid, student loans, administrative regulations, administrative discipline, administrative processes, and how the organization is managed. Obviously, if the appropriate support is provided by the university in the mentioned areas, it will lead to a good relationship with the university environment and more compatibility of the student with the university and the student's academic success. Based on the result of this study, education of economics refers to financial investment and supply financial sources. Financial support refers to financial support funds and financial encouragement.

P2: "This is an economic debate that I think is important. The economic debate I'm talking about and the one I'm talking about is the education economy. We have to pay attention to how much we want to spend. A student who wants us to go through this process." How much does that person have to pay and get this training? Does he have the ability to do this or not?..... It seems to me that combination education helps a lot with educational justice and helps the education economy a lot. So, if we can make good use of this process and support it, I think it can be effective."

P9: "... Let's build a system and provide resources. This will make us not have any losses, such as a fallen student. Another issue is that a poor student puts money into the system. If our design is in the support system from the beginning, we will pay more to it but, in the end, our total cost may not be higher because we have a higher quality."

P10: "We definitely need to have a good technical team. We definitely need to have such people in our service. We definitely need more financial support for these people... "We want employees to be trained in this area and have strong financial support so that they can be accountable."

### Discussion

Based on the results of the present study, 6 main components and 19 subcomponents of the student support system in combined learning of Iranian universities of medical sciences were identified. The result of this study was 6 main components (themes) as follows: "scientific-cognitive support," "systematic support," "human resource support," "emotional support," "technical support," and "financial-economic support." From the perspective of the experts participating in this study, the student support system is essential in any educational system, especially the virtual educational system, and blended learning is more important than face-to-face and traditional education.

Effective SSS is an important tool for activating students to cope with academic and personal pressures of distance learning. Student satisfaction assists to attract new students and retain current ones, improve their overall performance, and increase students' progression rates.<sup>[14]</sup> In confirmation of this issue, support services are important for keeping traditional and distance learning; however, distance learning requires more student support than traditional training due to the physical separation of teacher and student.<sup>[8]</sup> The research findings highlight the importance of academic and nonacademic support and the roles of technologies in activating more flexible, interactive, and personal learning environments that require new ways of providing learning support for open, distance, and online students.<sup>[15]</sup>

This support includes support for learning, students, teaching and learning process, and assessment of learning, institution, and programs. The research to identify the main concerns of distance learning students in the Asian region shows that there are five main types of support for distance learning students, including affective support, reflective support, cognitive support, gender support, and systemic support.<sup>[10]</sup>

Efforts to provide services to students such as guidance and counseling sessions, library facilities, interactive education through television and radio, and other similar activities that are components of Student Support System (SSS).<sup>[16]</sup>

Based on the results of this study, one of the most important components in supporting students is scientific-cognitive support. This support includes

support for curriculum content, learning strategies, evaluation, library support, and educational well-being. Consistent with our findings, the role of educational design is critical in distance and open education because distance learners are physically or geographically separate from their teachers. The educational design process includes identifying learners' needs, definition of educational goals, designing assessment, and designing teaching and learning activities to ensure quality instruction.<sup>[17]</sup>

Sego states that educational support includes intellectual, mentorship, tutorship, and all learning activities. He states that learning support should provide a framework for guiding students through their studies; furthermore, it leads to the development of learning and coping skills, the development of independent learning and decision-making skills, and the growth toward lifelong learning.<sup>[18]</sup>

Learning material support is a feature that a course module must have in order to make it effective and include learning objectives, useful advances, using many examples and case studies, top coherent content, use symbols, using assessment tools to assess students' progress, brief descriptions, spaces to respond to your evaluation, review topic, and self-assessment questions.<sup>[16]</sup> Learning skills training is a useful support for students who need to acquire time management skills, study, self-regulation and responsibility, independent learning, student-centered learning, written assignments, and assessment and general coping mechanisms.<sup>[19,20]</sup>

The systematic support in this study refers to support systematic model, administrative support, management support, and legal support. Resource studies indicate the importance of this support in the student support system. In this regard, ethical considerations of e-learning are related to political and social impact, cultural diversity, prejudice, geographical diversity, learner diversity, access to information, laws and regulations, and legal issues. The institutional dimension of the framework addresses issues related to administration, education, and student services related to e-learning.<sup>[21]</sup>

One of the components of support in the student support system in this study is the support of human resources. In the support system, students should also pay attention to the support of teachers and staff to present their duties in e-learning. Consistent with the findings of this study, Daneshvar's study has shown that successful DE programs require balanced performance with many different components, including teacher support, including educational support, psychological-emotional support, and technical support.<sup>[22]</sup>

Investing in human resources and strengthening their skills and knowledge in universities and organizations and educational institutions with virtual and combined education is important. Research findings have shown that knowledge management can have significant effects on organizational learning and organizational innovation of faculty members. Organizational learning due to its role in increasing the mental ability and knowledge of the organization leads to increased innovation in the organization; knowledge is a strategic resource that must be created in order to survive and maintain a competitive advantage. Thus, the management of such a strategic resource enables the organization to achieve special benefits, including cost reduction and quality improvement.<sup>[23]</sup>

One of the layers of this theme in the present study is support for interactions. In the support system, it is necessary to pay attention to the interactions that exist in this type of training and provide a suitable basis for creating and supporting these interactions. Based on the findings of the present study, one of the important components in supporting the learner in combined education is paying attention to the effective establishment of interactions between the learner and the content, the learner with the teacher, and the learners or each other. This finding is consistent with the findings of Shaihidi *et al.*'s study, and interaction plays an essential role in the teaching and learning process. E-learning, using emerging technologies, provides a wide range of interactions for access to a wide range of information as well as communication. The interaction in the electronic environment should be designed very carefully and thoughtfully to achieve the goal of education, which is the correct and complete transfer of content to the learner. More interaction seeks to engage students with each other, professors, and inhuman forms of content. Familiarity with the concept of interaction and the use of its various forms in e-courses, develops existing capacities to help and strengthen e-learning programs and their presentation.<sup>[24]</sup> This finding is consistent with the findings of Mokaripour *et al.*'s study, the task of a learner in distance learning is to interact with the content, and through such interaction, the teacher and other learners must take responsibility for their own learning and transfer all their knowledge to the learner.<sup>[25]</sup>

Emotional support in this study refers to psycho-cognitive support, advisory support, and cultural support. This support includes attitude support and psychological, advisory support, and cultural support. In confirmation of the findings of this study, counseling support includes various aspects of guidance and counseling. In the corresponding studies or other media, it relies more on individualistic. The focus of such services is on how to deal with academic concerns or career

counseling. According to this study, support for the learner includes the following: mentoring, tutoring, coaching and counseling, assessment, and advice and guidance.<sup>[26]</sup> Students need a sense of physical and mental safety to create learning because fear and anxiety weaken cognitive capacity and short circuit the learning process.<sup>[27]</sup>

According to the results of the present study, technical support is an essential component for supporting students in e-learning, including the creation of hardware and software infrastructure with appropriate bandwidth and Internet access for learners. In agreement with the results, studies related to DE have shown that various factors are needed for the success of DE and the role of technology in this field has been widely acknowledged. ICT infrastructure is important for distance learning.<sup>[28,29]</sup> Institutional technological capabilities (bandwidth, technical support, and infrastructure) are essential to support e-learning and distance learning programs.<sup>[30,31]</sup>

In this study, financial-economic support is one of the components of the student support system in combination education, which points to the support and financial assistance to learners, professors, and staff, and it emphasizes the educational economy. According to the results of this study, one of the challenges that students face in accessing support services is economic constraints. Learner support is a general term used for a wide range of services provided by institutions to help their students achieve their learning objectives, to gain knowledge, expertise, and skills to be successful and complete their course or studies.<sup>[32]</sup>

### Limitation

The data collection tools were interviewers; therefore, this qualitative research is not without errors because sometimes the interviewers' opinions and opinions affect the subject of the research and the process of data collection.<sup>[33]</sup> However, the researcher has tried to direct the interview path to the subject of research as much as possible. On the other hand, the limitation of this research was its main focus on interviews with faculty members in the field of virtual education and combined education. Staff and students were not part of the study, and their experience may add to the richness of the study. Therefore, it is suggested that researchers pay attention to the issue in future research and these limitations need to be addressed in future research.

### Conclusion

The absence of student support system may indicate that learning support issues may not be known. This may be due to various constraints such as financial costs, insufficient human resources to support the learner, or

the role of learning support may not be considered as a matter of value and attention.

The results of this study showed the important and basic components in the system of supporting students in teaching medical sciences. One aspect of quality in any education system, especially the combined education system, is the student support system. From a competitive perspective, higher education needs to pay special attention to designing and implementing a system of student support along with other important elements in education in order to be successful in combination education and to have an effective combination education system. University officials and educational institutions can play an important role in students' academic success by addressing this issue and implementing SSS. In this regard, using the results of this study can be helpful.

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### Conflicts of interest

There are no conflicts of interest.

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