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Review Paper

A conceptual remote educational framework based on Massive Open Online Courses in vocational and Kar-o-Danesh schools

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Abstract

A conceptual remote educational framework was introduced based on Massive Open Online Courses (MOOC) in vocational and Kar-o-Danesh schools in Fars Province-Iran. The study was a developmental work with a qualitative design, which was carried out using content analysis and semi-structured interview. The participants were selected through a purposeful sampling method based on theoretical saturation criterion. The designed framework contained four main aspects, namely directors' support (awareness, commitment, and responsiveness), upstream policies support (vision, amendment of plans, and policy making), preparing the ground (expert forces, beliefs, hardware, software, appeal for users, support, education, and motivation), and planning (setting goal, content development, and evaluation), and execution (feasibility study, design, application, and evaluation). The presented conceptual framework in mentioned schools of Fars province helps educational policy makers in launching the MOOC system and its application gives students the opportunity of learn online using new interactive tools, actively participate in the education process.

Key Words: Conceptual framework, vocational schools, Fars Province

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Introduction

In history and around the world, education has always been a function of society's goals and has changed depending on the condition in society. The education system may emphasize physical aspects and foster bravery or it may emphasize virtues and spirit and foster good personality or both of them. Still, vocational education is one of the items that is valued in all societies and social and cultural situations by all social classes. In fact, prosperity and pride of any society depend on professions and jobs considered as industries, expertise, and products of that society.

These industries and expertise have been transferred from fathers to sons and from masters to pupils and they have grown and developed over ages. Therefore, the history of vocational education is as long as the history of man's social life. Whether taught by fathers to sons or by institutes beyond family, vocational education has been always considered as a serious matter. Currently, vocational education is one of the main national agendas in the developed and developing countries to expand businesses and fight unemployment (Mathur et al., 2022; Atangana and Tabi., 2022).

Vocational education in Iran was started 93 years ago with the establishment of the first vocational school in Tehran in 1926. There have been lots of ups and downs and despite recognition of the value and necessity of vocational education among legislators and officials the system has failed to be as successful as expected. The reasons for this poor performance include outdated approach to this type of education, lack of a comprehensive planning, very limited interaction between the work market and education, lack of a centralized policy making and management, failure to implement the laws, inefficient trainers, lack of equipment, and failure to update the job pyramid. A pathological examination of the process of changes in vocational and Kar-o-Danesh education over the past 100 years shows that changes, macro/micro reforms and even copying educational plans and programs have not been compatible and mostly implemented in an unorganized and uncoordinated manner. Thereby, there is a need for educational revision and reform and use of other countries and educational bodies' experiences (Bahrami Jazi, 2016).

With the introduction of new technologies and information and communication technology (ICT) in particular in education systems and at all levels, we can see tremendous changes in the education systems of the developed and developing countries. ICT comprises hardware, software, and thought-ware that makes the flow of information and use of information possible (Jafari et al., 2019). One of the outcomes of the expansion of ICT is remote education. The new phenomenon appeared as correspondence study, independent study, off-campus study, and remote education and later developed into electronic education, distributed education, virtual learning, computer learning,

internet learning, network learning, and web-based learning (Moeinikia et al., 2016). Remote education is a type of education where diverse technologies and media are employed and education takes place using textbooks, radio programs, email, interactive TV, satellite and Internet-based technologies like social media, forums, online conferences, and so on (Loveridge, & Spector, 2014). One of the new technologies that has created noticeable changes in remote education is MOOC.

MOOC is the latest remote education method, which is still growing (Altalhi, 2021). It started with conceptualization of communicative learning and open education resources movement. MOOC is a relatively new phenomenon, which has drawn a great deal of attention in universities and higher education systems (Kala et al., 2022). According to Oxford dictionary, MOOC is a free educational course provided via the Internet to users (Parry, 2013). It is an online course delivered to users around the world via the Internet (Rezaie et al., 2017).

Aside from the common features seen in different types of MOOCs, there are two main types of MOOCs. One is a classic MOOC that needs specific planning to guide the learner like an instruction. Classic MOOC is also known as transition MOOC. The second main type of MOOC is communication MOOC with less emphasis on guiding and directing. In this type of MOOC, educational materials are provided to learners and they design the course for themselves, control it, and learning is realized through interactions between the learners. This type of MOOC is also known as cMOOC. These courses are held by university professors and experts. MOOC has created opportunities for free and open access to education for everyone so that learners can experience online learning (Teo et al., 2020). Today's world is the world of speed and progress, which entails facilitated access to education. The expansion of virtual education and penetration of remote education technologies designed to offer education through new methods is one of the shortcuts to major destinations (Esmailpour, Grami, and Pourghaznavi,2016). Clearly, with the expansion of computer-based education, the traditional education models need to be replaced with new models. One of the hot topics in science education in many developed countries is how to prepare students for a society that undergoes a fast process of computerization. In this sense, emergence of MOOC is of great importance (Green, 2012).

Studies on MOOCs have shown that when designed and implemented with high standards, they can be a great step toward equal access to educational opportunities (Dortaj et al., 2017), education globalization (Bozkurt et al., 2017), and attracting more learners. Researchers believe that moving toward equal educational models using MOCC model is the key for the survival of educational organizations and they introduce it as an efficient and desirable model to improve educational

performance (Donitsa et al., 2022; Liang et al., 2022; Liu et al., 2022; Wadams et al., 2022). Still, several studies have shown that the successful design, codification, production, implementation, and delivery of a MOOC depends on a thorough examination of different aspects such as pedagogy and education, sociology, culture, economy and trade, computer engineering, and ITC (Buzkart, 2016). The breadth and diversity of MOOCs have highlighted the cultural and social and technology (Borrella et al., 2022) necessities and requirements for implementing MOOCs.

The expansion of ICT, changes and replacement of science and knowledge with new ones within a few years and the tendency in people to keep learning all are the causes that make online and remote education one of the most important educational mediums. Many educational institutes have entered into this field recently. In addition, the COVID-19 pandemic and the lockdowns in many countries accelerated expansion of this type of education (Amado et al., 2022).

In this situation, many schools and universities have found online and remote education programs, online courses, MOOCs, and open stage courses as the only way to deal with the limitations caused by COVID-19 pandemic. Still, the novelty of the infrastructure, lack of know-how, and doubts about its efficiency are the main challenges in the expansion of MOOCs. Researchers believe before introducing MOOCs courses in Iran, the education system needs to examine executive necessities and elements. In addition, vocational and Kar-o-Danesh schools need to equip themselves with the latest technologies and educational programs and utilize them to improve their performance and knowledge of learners. Taking into account this necessity and paucity of research works in this field, the present study tries to develop a conceptual remote education framework based on MOOC in vocational and Kar-o-Danesh schools in Fars Province, Iran. The question asked is "What would be a conceptual framework for remote education based on MOOC in vocational and Kar-o-Danesh schools?

Method

The study was carried out as a qualitative work and an applied work in terms of the objectives. The study method was inductive qualitative through content analysis based on Attride-Stirling's approach. The study was performed in three steps. The study method is based on a theme network, which is widely used in research projects. The theme network contains three sets of codes and concepts including basic themes, organized themes, and comprehensive themes (Gholizade et al., 2021).

The potential participants were experts in the educational management field in Fars Province with at least 10 years of experience in vocational schools. In addition, academic community members and those in Farhangian University (specialized in training school

teachers) who had a published book or paper in this field were included. Sampling was done through purposive sampling. After determining the sample size, 32 individuals were interviewed through a semi-structured interview (20 men and 12 women including nine university professors and the rest were experts, students, and school principals and deputies). The interviews were stopped when theoretical saturation was realized, which was achieved with 28 interviews and the interviews continued up to 32 interviews. All the interviews in the qualitative phase were semi-structured interviews.

The research tool was semi-structured interviews without time limitation so that on average, the interviews took 40 to 70 mins. After the interviews, the theoretical ground study and document review were carried out based on a content analysis strategy. The patterns in the qualitative data were identified and along with designing the content frame and network, content analysis was carried out. To make sure of the credibility of the results, coding was done by two experts and to make sure of consistency between the coders, the interviews were performed with different groups (university and higher education institutes professors, experts, students, and school principals and deputies with at least 10 years of experience). As for transferability of the results, interviews were conducted with 32 experts and to observe neutrality (confirmability) all details were recorded. Two checking methods including participants check and non-participating expert checks, were used in the study.

Results and Discussion

Through the content analysis method, the content of each model was extracted and categorized in three steps. Step one was descriptive coding so that the elements in each model were extracted as codes and basic meanings (i.e. recurring and unique specifications of the content). Step two was interpretive coding so that the basic meanings were categorized based on the theoretical grounds and interviews and named as organized (axial) themes. A comprehensive theme that encompasses all the meaning was determined in step three. Through this, 250 codes were extracted and after removing duplicates, the codes were categorized and combined based on their similarities and relevance. The results were 181 basic themes, 21 organized themes, and five main themes (Table 1).

The obtained themes were modified and revised based on the interviews and responses by the participants. Through this, abstract themes were extracted; the results are listed in Table 1.

Table 1- Basic, organized, and comprehensive themes of MOOC model

Main	Comprehensive themes	Organized themes	Basic themes
MOOC	**Directors' suppose**	***directors' familiarity***	Directors' familiarity with ICT, MOOC- utilization of the technologies by directors, familiarity with the current and future potentials of MOOC
		Support by directors	Support for virtual and IT programs; support for change in programs; support for implementation of MOOC program; support for executive policies and laws of MOOCs; leading change processes; covering expenses; rewarding; regular payments; adequate payment for content development.
		Responsiveness of directors	Accepting regulations and having power; dedicating physical and financial sources; identifying the factors in MOOC and the controls
	Upstream policies support	***Vision***	Proper time vision to codify and implement MOOC; observing upstream development plans; developing strategic plans and existential philosophy of MOOC, futuristic perspective; requiring move toward MOOC as an education method for the future
		Amendment of upstream policies	Flexibility and adaptability in upstream policies about MOOC- adding MOOC to upstream and development policies; emphasis on virtual education in upstream policies; emphasis on involving stakeholder in preparing the development policy
		Policy making	Determining short/long-term objectives; developing supportive legislations for MOOCs; developing executive regulations for MOOCs.
	Preparing grounds	***Expert forces***	Skillful teachers; web experts; human resources experts; computer experts; expert human forces; server security; teacher's knowledge of working with multimedia software; support experts; experts who can solve problems; experts with good communication skills.
		Beliefs	Observing religious concerns, students' beliefs; defining

			different access levels for different age groups; observing religious requirements during Ramadan in particular; believing the MOOC is not free; informing families when their kids used mobile devices; solving families' concerns; controlling students' web surfing; creating value; paying attention to ethics;
		Hardware	Proper hardware; updated equipment; compatibility with mobile devices; VR goggles; providing powerful servers; preparing hardware as needed by students; preparing PC and laptop units.
		Software	Developing required applications; software; developing software for physics and chemistry courses, simulators; cloud processing and web potentials; developing video clips and films
		User friendliness	Simulating function; engaging students; handwork; user-friendly MOOC; replicating actual work environment; offline compatibility; ease of use; simplicity; compatibility with different systems; ease of sharing information; accessibility from different places;
		Backup	Timely update for software and hardware; training instructors and teachers; online back up; good upload and download speed; access to online support; continuing polling about MOOC performance
		Educational	Familiarizing teachers with different systems; recruiting compatible teachers for content development; holding workshops for teachers; teaching how to use MOOC; education performance assessment; providing pre-organizers; preparing students; emphasizing on practical works; using different styles; paying attention to education method; multi-activity learning; facilitating role of teachers; combining offline and online education; deepening education

			through giving examples; taking into account pre-organizers.
		Motivation	Preparing the ground to sell educational content on the web; making MOOC financially viable; right to publish on the web; introducing teachers and stakeholders through producing efficient content; connecting ranking system to content production; creating interest in students; self-energizing in students; removing Internet filtering
	Programming	***Setting goals***	Paying attention to the needs of the learner community; paying attention to behavioral goals; macro and micro goals; determining job market needs; paying attention to curriculum structure.
		Content production	Content integrity; determining headlines; updated content; using students' opinion for designing group learning content; content development group work; participation of teacher and student in content development; motivation to create content in stakeholders; optimizing content volume; content development based on vocational school strengths.
		Evaluation	Test analysis; test center at county level; step-by-step feedbacks using software; continuous assessment; coordinated and system tests; observing and monitoring tests using camera; authenticating using GPS; diverse tests; practical assessment in actual environment; project-based

			assessment; giving personalized homework; giving feedback to students; timely feedback to students.
	Execution	***Feasibility studies***	Pilot plans; face to face and remote planning, determining the number of students; checking the number of students online; simulator apps number; developing software based on expected number of users; providing enough processing power given the number of online users; providing required CPU power; preparing hardware and software given the number of students; taking into account offline-online content at the same time; combining traditional and MOOC systems.
		Design	Taking into account the principles of psychology in developing MOOC; taking into account security concerns; multi-step password compatibility; energy saving concerns; future job opportunity; observing standards; taking into account goals and needs; comprehensive-oriented approach; taking into account educational justice; semester designs and prerequisites; flexibility
		Application	Step-by-step implementation; pilot planning; free publication of content on the web; using YouTube, Instagram and SHAD applications; parallel execution with other programs;
		Evaluation	Awareness of strengths and disadvantages; internal assessment; giving feedback to designers; carry out poll among students, teachers, and beneficiaries; learning about organizing process and effectiveness of MOCC; preparing the ground for program development

As listed in Table 1, after removing duplicate themes; 181 base themes; 21 organized themes; and five comprehensive themes remained. The themes network (Fig. 1) was developed in the next step.

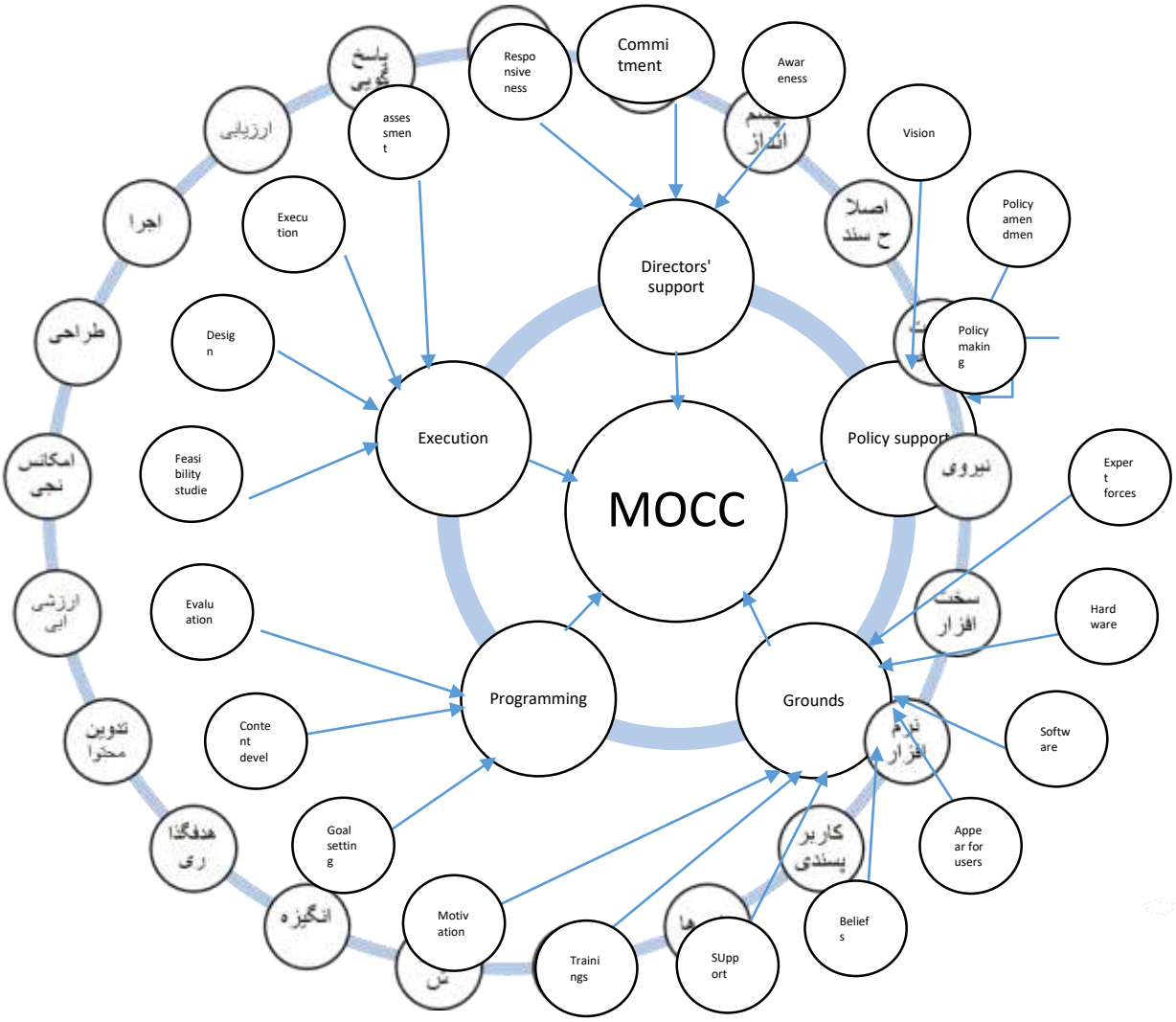

Figure 1- Theme network of MOOC model elements

As shown in the figure above, the MOOC model for vocational schools contains five themes including directors' support, upstream policy support, ground preparation, programming, and execution. Each theme in return is composed of organized themes. Directors' support consists of awareness of organizers, commitment, and responsiveness. That is, directors have a notable role in executing MOOC. In addition, upstream policies consist of vision, development plan reform, and policy making. The preparation ground theme consists of human force, hardware, software, appeal for users, beliefs, support, education, and motivation. In addition, the comprehensive theme of programming consists of setting goals, content development, and assessment. Finally, the execution

theme consists of feasibility studies, design, execution, and assessment.

Discussion and Conclusion

There is a paucity of studies about the conceptual framework of remote education based on MOOC. The present study was carried out following Attride Sterling (2001) and the indices and measures of the framework were found and reported. The findings indicated that the framework consisted of the themes upstream policies, directors' support, preparing the ground, planning, and execution.

The main themes in this framework are upstream policy support and directors' support. Without vision and proper policy making in the design and execution MOOC in education, satisfactory outcomes may not be expected. Therefore, it is essential to have a vision and take into account indices such as a reasonable timeframe to develop and execute MOOC; observing development policies; developing a strategic plan and existential philosophy of MOOC; adopting a futuristic point of view; and necessity to walk toward MOOC as the future education. The education organization of Iran can clarify its policies and beliefs about designing and executing MOOC by developing its vision document. The authors found no similar study or model of MOOC where the elements were discussed. One of the guiding documents in the field of education system development and changes is the Fundamental Document of Development. The participants believed that reforming the developing document and adding the instructions for designing the MOOC system was of great importance. They noted that the Fundamental Document of Development must highlight flexibility in the development policy regarding MOOC, add MOOC to upstream policies and development documents, emphasis on virtual education, and also acknowledge participation of the stakeholders. This element was not mentioned in previous studies. Another topic under upstream policy support was policy making. The participants highlighted the necessity of codifying long/short-term goals, codifying MOOC supporting laws, and codifying MOOC executive laws.

Another important aspect of the framework of the MOOC model in vocational schools was directors' support. The three key indices for acceptance and expansion of a technology are top directors' support, external pressure, and expertise of information management departments. Directors' awareness, commitment, and responsiveness regarding designing and executing MOOC programs were highlighted by the participants. As for the awareness element; familiarity with ICT director; familiarity with MOOC, application by directors; and familiarity with the current and future potentials were important. The commitment element consisted of support for future and virtual programs, supporting changes in plans, supporting execution of

MOOC programs, supporting executive policies and regulations, leading changes, determining costs, rewarding, regular payment, and good payment for content creation. As for responsiveness, accepting regulation and having power, allocating physical and financial resources, determining factors affecting MOCC, and controlling them were important. The authors found no similar study on directors' support for comparison. Zhao and Liu (2018) carried out a study titled "practicing and studying promotion of MOOC in higher education based on the theory of dissemination of innovation." They highlight three key elements of top directors' support, external pressure, and expertise of the information department director about designing MOOC. In this regard, our findings are consistent with their results regarding the aspect directors' support. In addition, the proposed framework had another aspect named "preparing ground." This aspect encompassed experts, beliefs, hardware, software, appeal for users, support, education, and motivation. It is not possible to design a MOOC program without the knowledge of experts. Skillful teachers, web experts, expert human forces, computer experts, server support experts, teachers' knowledge of how to work with multimedia, work forces with problem solving skills and communication skills were considered essential by the participants.

Another element under preparation for the ground was beliefs, which has a notable role in the design, implementation, and execution of MOOC programs. Taking into account religious beliefs, students' beliefs, defining different access levels for users, respecting limitations of Ramadan month and praying times, informing parents when their children use their mobile devices, answering concerns of families, controlling students' access to websites, creating value, and observing ethical concerns are critical in this regard. Doubtlessly, respecting religious beliefs, informing families, and controlling students' access to websites in Iranian society are of higher importance given the religious beliefs in the society.

The next element under preparing the ground was hardware. Access to proper and up to date equipment, compatibility with mobile devices, VR goggles, powerful servers, capacity to meet the demands, access to PC and laptop were mentioned as important factors.

As for software, efficient applications, diversity of software, creating software for special majors like electricity, developing simulators, providing access to cloud processing and available options on the web, and producing video clips and films were highlighted by the participants.

Appeal for users was another element found in the study comprising the capability to

simulate student engagement, handwork, user friendliness, similarity to actual environment, offline compatibility, good timing, simplicity, compatibility with different systems, ease of sharing information, and mobility.

The next element was MOOC support encompassing timely updates for software and hardware, training teachers and instructors, online support, upload and download speed, access to system support, and continuous polls about the performance.

Education was another main element in this conceptual framework. Familiarizing teachers with different systems available, training teachers capable of content development, holding workshops for teachers, training courses of working with MOOC, education evaluation, considering pre-organizers, preparing students, taking into account practical works, using different aspects, paying attention to teacher method, multi-activism in learning, facilitating role of teachers, combining online and offline educations, and deepening education using examples.

The last element under preparing the ground was motivating. Opportunity to sell using web framework for content creators, making MOOC profitable, freedom of publishing content on the web, acknowledge teachers and stakeholder with good content produced, adding content developing to the promotion system, creating motivation in students and promoting self-motivation in them, and removing Internet filter were highlighted under this element to create motivation and desire in content producers.

Another aspect of the MOOC framework was programming with elements including setting goals, codifying content, and evaluation. Setting goals included the learners community's needs, behavioral goals, macro/micro goals, detecting job market needs, and curriculum structure.

The content development element contains aspects integrity, headline codification, updated content, using students' opinion in developing group learning content, content work group, teacher and student's engagement in content development, development of content by stakeholders, optimization of content volume and production based on the advantages of vocational schools.

Evaluation element contained items including test analysis, test centers at county level, step-by-step feedback at software level, continuous evaluation, coordinated and systemic tests, monitoring tests using cameras, authenticating using GPS system, diverse tests, practical tests in actual environment, project-based evaluation, assigning personalized assignments, and giving timely feedback to students. Green (2012) mentioned and emphasized the role of evaluation in the MOOC system.

The next critical aspect of the framework was execution with elements including feasibility study, design, implementation, and assessment. The aspect feasibility study included indices pilot design, face-to-face and remote program, total students report, total online students report, number of simulator apps, software designed for the expected number of students, providing adequate RAM capacity, providing powerful enough CPUs, preparing hardware and software based on the number of students, available online and offline content, and mixing traditional and MOOC systems. The design aspect also included items paying attention to psychological principles in MOOC development, MOOC security, multi-step password, energy saving concerns, future job demand, standards, objectives, needs, comprehensive-orientation, educational justice, semester designs and requisites, and flexibility. The aspect execution included indices step-by-step implementation, pilot implementation, freedom of publishing content on the web, using YouTube, Instagram, and SHAD, and parallel implementation of programs. Application and making MOOC program implicational entails step-by-step implementation of the program and pilot program.

The final aspect was assessment with elements including awareness of advantages and disadvantages, internal assessment, giving feedback to designers, conducting polls among students, teachers, and stakeholders, knowledge about organization and effectiveness of MOOC, and preparing grounds for developing the program.

We were not able to find similar studies on the education system and vocational schools in particular to compare the proposed framework with other studies. As noted, there was no study emphasizing the role of upstream policies in the design and implementation of MOOC. Still, Zhao and Lio (2018) highlighted three key indices of top directors' support, external pressure, and expertise of information department directors about designing MOOC programs. Dortaj et al. (2017) designed and validated a remote MOOC education model for university students and highlighted content development, evaluation, preparation, and execution, which are consistent with our results to some extent. Our findings are also consistent with Farzan et al. (2019) in terms of element support and expert forces. They emphasized the role of support and professional merits in the design of the MOOC system. In terms of appeal for users, software, and hardware, our findings are consistent with Zhao and Lio (2018). Regarding results and programming, our findings are consistent with Jafari et al. (2017); who placed goal, content, method, and evaluation as the central phenomenon of their paradigm model and highlighted the role of culture in using MOOC. Culture was represented in this story as

beliefs, which is a wider concept that was mentioned in Jafari et al (2019).

Designing and implementing a MOOC system in vocational and Kar-o-Danesh schools in Fars Province entails reforms in the upstream policies and top directors' support. By implementing the reforms and showing the importance of MOOC to top directors, they will have the motivation to support it and prepare the ground for implementing and executing it. Programming is the next step followed by the execution process and implementation. Evaluation is a major concern throughout the whole process. Future studies can evaluate and validate the proposed conceptual framework using quantitative methods in larger population sizes.

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