Managerial Analysis and Explaining the Viewpoints of the Students on Virtual Education During the COVID-19 Pandemic at the Virtual School of Medical Education and Management of Shahid Beheshti University of Medical Sciences in 2020

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Abstract

Background: In the current COVID-19 crisis, the necessity for respecting social distancing and making the new decisions by officials, and the closure of universities moved the classrooms to entire online home learning. Strategic planning allows the university to adapt its activities to meet the changing needs of the environment.

Objectives: The present study aimed at explaining the viewpoints of students and evaluating the phenomenon of virtual education of students during the COVID-19 pandemic in the Virtual School of Medical Education and Management of Shahid Beheshti University of Medical Sciences in the academic year 2020. Internal and external factors affecting this system were identified and analyzed.

Methods: The present descriptive-survey described the conditions and characteristics of virtual education and surveyed students' viewpoints on factors affecting this system of education. Using the TOWS (Threats, Opportunities, Weaknesses, Strength) matrix, the internal and external factor evaluation matrices were plotted, and the final score of each factor was achieved by determining its coefficient and rank, and proper strategy was formulated after analysis.

Results: The TOWS matrix analyses showed the overtake of threats by opportunities and the exceed of strengths over weaknesses in factors affecting the virtual education, indicating the strategic status of the virtual education of the virtual school in the ST (strengths-threats) cell.

Conclusion: Coronavirus outbreak is not the end of a pandemic, and there is still the risk of the emergence of other diseases and crises. The valuable experience learned from the Coronavirus era can be used in the development of virtual education in the studied and other faculties. Fortifying strengths, benefitting from opportunities, reducing weaknesses, and fixing threats can provide a suitable strategic basis for planning virtual education in Iran.

Keywords: TOWS Analysis; Distance Education: Virtual Education; Student; COVID-19

Background

In the 21st century, the academic community increasingly moves from the industry-oriented world towards the information-oriented, and transition from the physical world to the virtual one. By accepting to learn through computers, CDs, the internet, and similar technologies of the current century, traditional university education shifts onto virtual learning. If Peter Drucker's (2004) statement as: "We will not have a university in the future as what we have today" (1) comes true, it is essential to think of a solution and look into the future. The growing demand for virtual education opportunities significantly increases the number of courses offered by higher education institutions. Students unable to attend university due to work, family refusal, and far distance try to find ways to access education despite their limitations (2). Universities turn their attention to virtual education; through this simultaneous and asynchronous communication, teaching and learning are formed well (3). Many universities and higher education institutions are rapidly preparing various virtual education programs (4), and an institutional commitment to virtual education and virtual students form in them accordingly (5). All the activities and programs of virtual courses are to develop professors professionally and grow students scientifically (6). In the second half of the previous century, Iran experienced eight years of Imposed War that led to the closure of schools and universities for several months, when distance learning was not possible and extracurricular classes were held after reopening. On the way to move toward the information-oriented world, COVID-19, was suddenly introduced in Iran in February 2019. Despite its small size, the creature caused severe complications, greatly affected human life, and significantly changed the routine life. It also entered the education system and easily affected the second semester of the 2019-2020 academic year. Because of the possibility of irreparable consequences in educational spaces due to people gathering, there was no way to deal with the Coronavirus except the closure of academic institutions, which caused the students to stay home and learn remotely. Using the capacity of cyberspace was essential under such circumstances. Although this educational system is useful, the unavailability of all the educational options in cyberspace, the lack of appropriate infrastructures, and economic and cultural poverty prevented its successful implementation.

It is gratifying that this virus emerged when the internet, smartphones, and modern equipment are available to most of the world's population. Technology came to the aid of people in this global crisis and even compensated for some disturbances in education. COVID-19 caused the dominance of special conditions over the country, especially universities, and led them to strive to maintain their academic connections with students through virtual and distance education (7).

Beat believes that "electronic (e-learning) or virtual learning is a way allowing learners to work and study in the desired place, and communicate with the instructor without face-to-face contact at the desired time. Most institutions are rapidly offering virtual education programs and strive to reduce challenges and problems faced by this education system (7). Despite the excitement, facilities, and attractiveness of a virtual course, its application without analyzing the effectiveness may lead to failure in achieving the objectives (8). Holding virtual classes requires extensive financial, material, and human resources, and organizers and participants expect the courses to be useful (9). Management is always a stressful process (10). Planning is the management pillar, which links the present to the future (11). Strategic planning is an organized effort to make fundamental decisions and take measures shaping the direction of the organization activities within the legal framework. Strategic planning- an umbrella for the whole organization- determines goals, outlines, and the mission of the organization in a long time; it is comprehensive, long-term, at the highest level of the organization, and a framework for tactical and operational planning. The strategy of each organization is affected by its interaction with the external environment; therefore, predicting the future situation plays a pivotal role in the organizational success (11).

In the current COVID-19 crisis, the necessity of respecting social distancing and making the new decisions by officials, along with the current situation of education in Iran, the strategic planning allows the organization to adapt its activities and services to meet the changing needs of the environment. This planning codifies a framework for improving the program and provides a platform for restructuring programs and organizational communications and collaborations, and evaluating organizational progress in these areas. One of the methods used in strategic planning and the main instrument for strategic analysis in today's organizations is the SWOT (strengths, weaknesses, opportunities, and threats) analysis model or TOWS matrix. The uncertainty caused by environmental changes, as well as the acquisition of more profit, has made the TOWS matrix an undeniable necessity for organizations. The TOWS analysis is a tool to identify the threats and opportunities existing in the external environment of a system and recognize its internal weaknesses and strengths to assess the situation and formulate a strategy to guide and control the system (10, 11).

In internal factors, strengths include the distinctive competencies through which the organization can gain a competitive advantage over competitors. The organization should pay special attention to its internal and external strengths (15). Weaknesses include defects and negative points, limited or lack of resources, skills, facilities, and abilities that significantly hinder the performance of the organization (15). In external factors, the opportunity is a major desired success in the external environment of the organization-e g, recognizing a part of the market that was forgotten until then, and is an environmental element that the organization can take advantage of it. Accurate analysis of the external environment may lead to the identification of new opportunities involving in organizational development (15). The threat is an unfavorable situation in the external

environment of the organization that can be troublesome and dangerous. It occurs when the conditions of external environment endanger the reliability and profitability of the organization (15).

The TOWS analysis was first introduced in 1950 by George Albert Smith and Roland Christensen, Harvard Business School graduates, and Jack Welch employed it to examine the GE (General Electric) matrix of strategic planning and increase his organization's productivity. Bonnie Taylor considers the ultimate purpose of TOWS analysis as helping organizations to be fully aware of all the factors influencing decision making. The TOWS analysis helps organizations become fully aware of all the factors that influence decision making. TOWS analysis helps to have a complete and comprehensive view of the right decision (11). This model then is a strategy that sometimes maximizes strengths and opportunities and minimizes weaknesses and threats. For this purpose, strengths, weaknesses, opportunities, and threats are linked in the general framework of SO.WO.ST.WT, and the strategy is chosen among them (12). Strategic planning is an investment in performance improvement. However, managers who want to use strategic planning to achieve success face obstacles to its implementation (13). Approaches to organizational management are different, each of which has strengths and weaknesses, and their introducers according to their knowledge, experience, and skills, focused on particular aspects. These models, considering multiple indicators, provided appropriate tools for evaluating the performance of modern organizations, which, over time and to meet environmental needs, became more comprehensive and considered more criteria and evolved (14).

Given the global importance of virtual education and a new perspective on this issue in the Coronavirus era, the internal and external factors affecting this system of education should be identified, using the TOWS matrix, to take appropriate and correct measures by determining its technological status; otherwise, they might be ineffective and lead to waste of resources.

Considering the general structure of the TOWS matrix and its influencing factors, the effectiveness of strengths, weaknesses, opportunities, and threats existing in virtual education was considered as the research hypothesis.

Objectives: The current study aimed at utilizing the management method of TOWS matrix to explain students' viewpoints, and evaluate the phenomenon of virtual education during the Coronavirus era in the Virtual School of Medical Education and Management of Shahid Beheshti University of Medical Sciences to identify internal (strengths and weaknesses) and external (opportunities and threats) factors to develop virtual education at this school and other universities, and use it as the basis of proper planning for virtual education in Iran.

Methods

The present descriptive-survey research described the conditions and characteristics of virtual education and surveyed students' viewpoints on internal and external factors affecting this system of education. Given the closure of universities, the statistical population available for the study included the students of the Virtual School of Medical Education and Management of Shahid Beheshti University of Medical Sciences that received the research questionnaire via email and returned it after completion. The questionnaire had two parts; the first included demographic information. In the second part, the students were asked to mention the strengths, weaknesses, opportunities, and threats of virtual education they received during the COVID-19 pandemic in the TOWS table, according to the provided definitions; then, the data were analyzed.

To use the TOWS model, first, the internal factor evaluation matrix (IFE), used to assess the strengths and weaknesses of the organization, is completed. Then the strengths and weaknesses are listed in order of relative importance or priority, and the coefficient of each factor is determined. The highest coefficient is assigned to the factor that has the greatest impact on the organization. The total weaknesses and strengths of the organization are a maximum of 100. The zero coefficient is trivial, and 100 coefficient means very important. Then the rank of each factor, ranging from 1 to 4, is determined; 4 means a very high strength; 3 strength; 2 low weakness; and 1 fundamental weakness. The final score is calculated by multiplication of the obtained sore in the rank number, which, regardless of the number of factors in the matrix, ranges from 1 to 4. If it is less than 2.5, it means that the organization is weak in terms of internal factors, and if it is more than 2.5, it indicates the strength of the organization in internal factors.

The second step in using the TOWS model is to plot the external factor evaluation (EFE) matrix, which is similar to that of IFE. After the plotting and identifying external factors, first, 10-20 factors causing opportunities are listed. Then the threat factors are put in the matrix, and a coefficient or weight is given to each of them, which indicates their relative importance in terms of influencing the opportunity or threat of the organization. These factors are ranked again from 1 to 4; it indicates the effectiveness of the current strategies in showing the reaction to the factor. Rank 4 means the excellent; 3 above average; 2 the average; and 1 the weak reaction by the organization. Finally, the coefficient is obtained by multiplying the coefficient in the rank. In this matrix, regardless of the number of opportunities and threats to the organization, the final score ranges from 4 to 1. The mean of this sum is also 2.5. If it is close to 4, it means that the organization can react well to opportunities and threats. If it is 1, it means that the organization could not exploit opportunities and avoid threats in formulating the strategies (11).

In the next step, the TOWS matrix, a suitable tool used by managers to select one of the four general strategies of SO, WO, ST, or WT, is formed. It combines the EFE (the vertical column) and IFE (the horizontal column) matrices and determines the final score of the matrix, and depicts the most appropriate strategy (11).

Table 1. The Evaluation Matrix of Internal Factors Influencing Virtual Education From the Viewpoint of Students

Internal Factors	Coefficient	Rank, 1-4	Final Score
Strengths			
1. Creating a suitable situation for students to access e-learning and prevent the loss of educational communication	4	3	12
2. Student-centered e-learning and the guide role of the teacher	3	2	6
3. The access of most students to the e-learning system	2	2	4
4. Announcing the readiness and willingness of student committees and students to produce educational materials	3	2	6
5. Proper cooperation and interaction between teacher and student	4	1	4
6. Experience of higher education students in using the LMS and learning during the relevant courses	5	3	15
7. The active presence of most students in NAVID system	3	2	6
8. students welcome to online problem-solving and the possibility of communicating with students outside of class time	1	2	2
9. Dividing the final exam to get a better grade	3	4	12
10. Benefiting from specialized, technical, and compassionate professors and educational experts in e-learning and their appropriate and timely responsiveness	3	4	12
11. Protecting students against Coronavirus, staying home with virtual education, observing home quarantine, and following the recommendations of the National Headquarters of the Fight Against Coronavirus Outbreak	8	4	32
12. Benefiting from virtual learning without attending classes, saving time, especially for traffic, owing to traffic jam problems, and the Coronavirus outbreak	4	4	16
13. Access to the content of sessions, files, and booklets uploaded any time	3	3	9
14. Gaining experience in virtual education and e-learning, and moving away from the atmosphere of traditional teaching and lecturing	3	2	6
15. The student's desire to search on the internet and learn more about the subject of the course after class	2	1	2
Weaknesses			
1. Lack of access to educational experts due to the school closure	5	2	10
2. Lack of full readiness of some professors in providing educational materials or their fatigue to hold consecutive online classes	5	4	20
3. Lack of paying attention to students' viewpoints in the evaluation of professors who hold online classes, until the end of the course, and the lack of an appropriate incentive mechanism to promote studens pationpartici	6	4	24
4. Students adaptation to traditional and in-person learning methods and resisting this system of education due to the lack of face-to-face communication	6	4	24
5. Lack of the mastery of some professors on e-learning standards and criteria (accumulation of the content, non-compliance with the time, etc.)	4	3	12
6. The high cost of the internet to access the system and imposing cost of the necessary equipment and hardware	7	3	21
7. Low quality of the audio, video, and even PowerPoint files provided by professors	2	2	4
8. Lack of familiarity of some students with the system environment (particularly undergraduate and older students in higher education)	3	2	6
9. A large number of training files, and the stress of students and confusion over the way of holding practical courses	6	3	18
10. Lack of easy access to the internet for some students who cannot attend and interact with the class, and worry about getting low grades	5	1	5
	100	-	288

Table 2. The Evaluation Matrix of External Factors Influencing Virtual Education From the Viewpoint of Students

External Factors Opportunities	Coefficient	Rank, 1-4	Final score
1. Creating an opportunity for students' empowerment using social networks and informal learning methods	4	4	16
2. Deployment of electronic infrastructures to produce and present educational materials by professors in the school and university	4	3	12
3. Configuration of Adobe Connect dedicated server	5	2	12
4. Proper access to acoustic rooms, video and audio recording facilities, and production of educational materials	3	1	3
5. Ability to upgrade the system and benefit from professors and students comments	4	2	8
6. Benefiting from capable professors and education officials in solving educational problems following the closure of the university	6	4	24
7. Accelerating the compilation of clear and practical instructions for the virtual education of students and public informing			
8. Proper interaction of educational officials with the National Headquarters of the Fight Against Coronavirus Outbreak, and informing the public through media	4	2	8
9. The feeling of responsibility, and pursuit of officials in solving the educational challenges following the closure of the university	5	3	15
Threats			
1. Unexpected lockdown of the university following the Coronavirus outbreak	5	2	10
2. The disbelief of some officials in the necessity of virtual education	4	2	8
3. Lack of a proper evaluation program	4	1	4
4. Delay in students' access to instructions for holding and participating in virtual learning courses	4	2	8
5. Lack of surveys of students in compiling e-learning guidelines	3	3	9
6. Lack of student representative in the e-learning committee at the university level	3	1	3
7. Problems in accessing high-speed internet with appropriate bandwidth to hold and attend online courses	5	2	10
8. Students difficulties in getting a report from NAVID system	4	2	8
9. Applying limits to the size of files uploaded by professors to avoid students' confusion	3	2	6
10. The newness of the system that needs dynamism and upgrading	3	1	3
11. Failure to fully access the NAVID system through some smartphones	2	1	2
12. Impossibility of the evaluation of professors by students in the system	2	2	4
13. Lack of a specific protocol or appropriate tool to evaluate the quality of e-learning	2	2	4
14. Lack of rules for the evaluation of students, which makes them unmotivated	3	2	6
15. Lack of getting e-learning feedback from students	3	1	3
16. Inability to hold online practical, internship, and apprenticeship courses	4	2	8
17. Lack of synchronization and unification of the rules to hold online programs in all the country universities	4	2	8
18. Insufficiency of the NAVID system infrastructures and limitation of servers in accepting a high volume of educational content	5	2	10
Total	100	-	218

Results

The Virtual School of Medical Education and Management of Shahid Beheshti University of Medical Sciences has four departments and disciplines: medical education, community-based education in the health system, e-learning, and health policy management and economics in-person and online in master's and Ph.D. degrees; this school had 594 students and 17 faculty members. According to the study results, the students were within the age range of 36 to 41 years, 86% in master's degrees, and 14% in Ph.D. courses. The majority of the students studied in medical education (72%) and minority (8%) in health policy management and economics; 68% were employed with an average work experience of 6 to 10 years. All of the students

had e-learning experiences. Due to the virtual nature of some courses, the provision of infrastructures and software facilities for many years, and with the authorities' decision to hold online courses to prevent a health crisis in the COVID-19 pandemic, the courses offered online. However, any change in the working environment first faces resist and is associated with problems, so changing the education system from in-person to online created many problems for both the school and students and was not welcomed at first. Although some students did not attend virtual classes in the early days due to unfamiliarity with the method of teaching and the low speed of the internet, the number of students in online courses increased with the improvement of conditions and increase of the internet bandwidth. The results of the present study can be considered in terms of factors influencing this education system to strive to improve virtual education, along with fortifying and benefiting from the strengths, reducing weaknesses and turning them into strengths, optimally using opportunities, and turning threats into opportunities.

The results of the evaluation of students' viewpoints as two internal (strengths and weaknesses) and two external (opportunities and threats) factors in virtual education are shown in tables 1 and 2 by determining the coefficient, rank, and score of each factor.

The score of strength and weakness factors in the present study was obtained by dividing the sum of the final score into the sum of coefficients (100) that was 2.88, greater than 2.5, indicating the strength of the school in internal factors or, in other words, the school strengths were more than its weaknesses.

The score of factors listed in the table of opportunities and threats in the present study was calculated by dividing the sum of the final scores into the sum of the coefficients (100), which was 2.18, smaller than 2.5, which, compared to

the reference number of 4, indicated that the organization reacted moderately to the opportunity and threat factors, and tried to use opportunities and limit the threats.

Strategy Formulation: The set of variables in the TOWS matrix is not new, but the novelty of this technique is its ability to coordinate and find a systematic relationship among the variables. Although many authors of strategic planning believe that organizations need using their strengths to take advantage of opportunities, other important equations, such as a reduction of weaknesses, should not be neglected in this way. However, weakness means a lack of strength, and strive to reduce it can lead to a distinct strategy for the organization. The TOWS analysis is also a technique to persuade decision-makers to find more effective tactics. The TOWS analysis systematically analyzes the strengths, weaknesses, opportunities, and threats after listing each factor, and by writing them down in cells by weighted scores from the intersection point of each, the desired strategies are obtained, and those fit the situation are reflected. Therefore, according to Figure 1, the TOWS analysis always leads to four categories of ST, WT, WO, and SO strategies (16), and the selected strategy is placed in the ST strategies cell by drawing the line intersects the point 2.88 from the horizontal axis- i e, the final score of the internal factor matrix, to the point 2.18 from the vertical axis-i e, the final score of the external factor.

The results of the present analysis indicated the overtake of threats by opportunities, and the exceed of strengths over weaknesses in factors affecting virtual education, indicating the strategic status of the Virtual School of Medical Education and Management of Shahid Beheshti University of Medical Sciences in the cell of contingency planning (maximum-minimum or ST). It is formulated based on taking advantage of system strengths to deal with threats, and aimed to maximize strengths and minimize threats. However,

Figure 1. TOWS Matrix Analysis
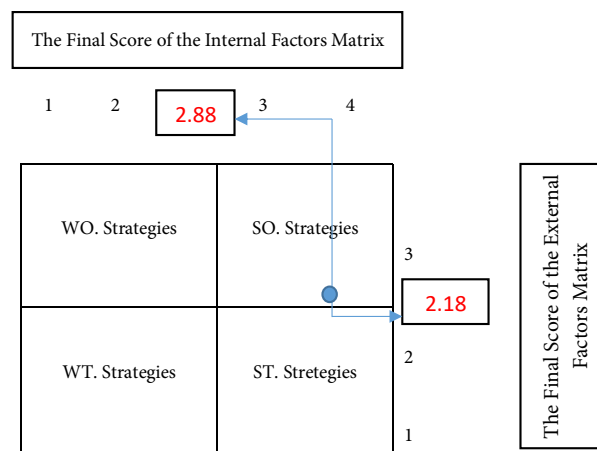
since according to evidence the misuse of power can have unintended consequences, no organization should misuse it to fix threats. This strategy is competitive, interactive, diverse, and convergent; it optimizes production, reduces costs in providing educational services, and increases the number of customers and training orders, even in content production, with coordination at technical, tactical, and operational levels. The development of production capacity (education) is an effective and goal-oriented strategy, seeking to do the right thing. The management model in this strategy is rational, aims to act efficiently and effectively, and has a mechanical structure using planning tools.

Discussion

It can be concluded, based on the obtained results, that the today's globally reputable educational institutions, which serve as the model for other institutions and official organizations to transform talented humans into healthy, creative, growing, balanced, and developed ones, and provide human resources required at different cultural, social, and economic levels, are expected that while examining the internal and external factors affecting them, to overcome weaknesses and fortify strengths, and take advantage of opportunities and avoid threats. University, as an educational organization with extensive and rich resources, plays a pivotal role in human life, since a significant part of modeling responsibility lies with higher education. Higher education has always been an issue for governments and a master topic for the progress and success of nations. Due to the extensive changes in the higher education system, as well as the high social demand for higher education, and considering the new obstacles, limitations, and challenges faced by the education system, it is necessary to formulate a strategic plan in this area. Undoubtedly, considering the particular circumstances of Iran, today's organizations, particularly universities and higher education institutions, are affected by political, social, economic, cultural, and technological evolutions, and their internal environment always changes with these influencing external factors. In strategic planning, the university is a dynamic system that accepts external influences and also influences the external environment. Also, the university is a complex organization that affects culture. One of the features considered in the Vision Document of the Islamic Republic of Iran in 2025 for the Iranian society is to have advanced and dynamic knowledge of the production of science and technology, relying on the superiority of human resources and social capital in the national production (17). Similar results were reported in studies by Little John (1997), Hitch (2000), Mani (2007), Perry (2004), and Niwang (2001), investigating factors affecting virtual schools, and determining the future status (18, 19, 20, 21, 22). The only distinguished point in the present study was the TOWS matrix analysis, which considering the factors remarked by the students on virtual education, the ST strategy was presented.

Virtual education for emergencies, including the current Coronavirus crisis, is the best environment and tool for maintaining the academic connection among the university, professor, and student, which completes in-person training under normal conditions. The implementation of virtual education was a good thing that brought qualitative planning and coherence to virtual education. The closure of universities is a sudden event in a country that, due to the lack of prior planning, in addition to surprising the authorities, requires time-consuming planning and is one of the weaknesses of e-learning. In the current days of Coronavirus lockdown, the professors should be appreciated for spending their resources, trying to compensate for the shortcomings with redoubled efforts, providing virtual training in a short period according to the students' weekly schedule, and achieving their relative satisfaction. In online education, before students, professors should be trained in this regard. Also, Iran's Ministry of Communications and Information Technology should provide facilities to enable the use of cyberspace for everyone. In addition, facilities should be provided so that professors and students can access smart facilities and equipment; hence, the Coronavirus could enhance educational capacities. Constraints have always led to human progress, and the Coronavirus, which poses a challenge to the education system, led humans to concentrate on education in extensive dimensions. Therefore, the authorities should strive to use all educational capacities. Based on the experiences gained during this period, virtual training can be a complementary and integrative method in many courses, even at some points of the time that capacity building is a priority in the development of such programs. Based on the results of the study and the selection of ST strategy for the studied school, considering the mentioned status through plotting the TOWS matrix, 16 strategies were identified, and by determining the attractiveness and importance of each using a quantitative matrix of strategic planning, five strategies with the following priorities were selected and introduced for the codification of operational programs so that while taking advantage of the school strengths, the existing threats can also be addressed: 1. Development of virtual education infrastructure, 2. Possibility of investment in virtual education, 3. The purposefulness of education and virtual learning evaluations, 4. Increased purposeful extra-organizational interaction, and 5. Improved participation of experts inside and outside the organization.

Conclusion

Undoubtedly, the Coronavirus outbreak is not the end of a pandemic, and the risk of the emergence of other diseases and crises still exists. It is worth making the lessons learned during recent months a valuable experience by fortifying strengths and taking advantage of opportunities, and reducing weaknesses and fixing threats in order to be used as a guideline in future crises by the officials, professors, and students.

Recommendations: According to the results, it is recommended that the educational officials identify the obstacles to the implementation of the strategic plan and try to fix them. Concerning the dynamic nature of management processes, it is recommended to hold training courses based

on needs and priorities derived from research, so that schools and affiliated organizations can promote the effectiveness of virtual education. It is also recommended that similar studies be conducted in universities starting virtual education, and the appropriate strategy be determined.

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