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Explaining the Strategic Position of Iran's Agricultural and Natural Resources University in Using Virtual Social Networks in Teaching and Learning Process

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Abstract

Virtual social networking (VSN) is an important new technology that can redesign the structure of society and help create a learning community on campuses. This research aimed to explain the strategic position of universities in the implementation of VSN and formulate appropriate strategies for its effective implementation. SWOT analysis, along with the construction of multilevel matrices, was used to achieve this goal. The statistical population was composed of the faculty members of Iran's agriculture sciences and natural resources universities, 28 of whom were selected as a statistical sample using the "special cases" sampling method. Data were analyzed using SPSS and MS-Excel software. In the qualitative phase, verifiably was confirmed by the following steps: 1) self-review of the research committee during the process of data collection and analysis; 2) use of special coding procedures in the analysis stage; 3) carrying out research steps by testing items such as raw data, data summarization products, and the noting process; 4) interview with faculty member separately and comparing their answers, and 5) using a steering committee to evaluate and conduct interviews. The validity and reliability of the research instrument were confirmed by the universities' faculty members and Cronbach's alpha calculation (0.83-0.92). Findings from the SWOT matrix showed that the studied universities were in a reformation (ST) position in using VSN. By using the SWOT matrix, we developed four strategies to implement VSN in the studied universities, which included attack strategies (SO), diversification (WO), reformation (ST), and defense (WT).

Keywords:
Agricultural universities, social networks, teaching learning

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INTRODUCTION

Learning is a purposeful activity that all the university's activities are formed around and involves many human and non-human elements. Therefore, the learning process cannot be designed and managed in isolation from other factors. In other words, "every educational phenomenon arises in a specific field or context. Therefore, achieving it requires specific conditions" (Bagheri et al., 2018). So, if we come down from the university's holistic perspective and focus on the students, their academic life will be viewed in the context of social media and constructive interaction with other actors, which is rooted in socio-cultural theories and approaches. Based on socio-cultural theories of learning, Fischer et al. (2007) argue that learning and innovation take place within social aggregates that share a common practice. Knowledge emerges by discursive assignment of meaning and social identification. It has also been argued that learning, thinking, and knowing occur through interpersonal relationships in a structured society. Therefore, it is not limited to "in-place learning" and/or "learning by doing", but the learner, as a newcomer, engages in environmentally sensible partnership with the ancients. Since the flow of information in the networks of communication has speeded up so radically, it appears to be warranted to speak of a new type of personality: the network individual. The network individual is the person reintegrated, after centuries of relative isolation induced by the printing press, into the collective thinking of society—the individual whose mind is manifestly mediated, once again, by the minds of those forming his/her smaller or larger community. Accordingly, Zarmpou et al. (2012) define learning as the creation of external networks of nodes (linking information and knowledge resources) and internal networks (neural networks). In this definition, instead of being limited to learning some separate topics without interrelation between them, learners effectively manage their learning environment utilizing the functional capacities of social networks such as influence on the learning process, problem-solving opportunities, and new ideas, fostering synergy, participation and promotion of innovation dissemination, cognitive development of lesson content, facilitation of positive learning outcomes, and development of teamwork skills, participation, critical thinking skills, and improvement of learning, friendship, and information exchange (Kolleck, 2013; Harris, 2013; Hommes et al., 2012; Pittaway et al., 2011; Petropoulou et al., 2010).

These changes have led to the emergence of the idea that the just pathway for achieving society advancement is knowledge-oriented development and the attempt to achieve a learning society is the first step of the movement (Krimi & Sharif, 2014). The emergence of such a vision created challenges for universities to apply new strategies to achieve a learning community around the world. Moreover, higher education has faced many challenges due to factors such as reduced quality of education and its incompatibility with society's needs. Some of these challenges are globalization and international higher education (Williams & Lee, 2015; Altbach & Knight, 2007), quality assurance (Mishra, 2007), privatization (Jamshidi & Zeinabadi, 2013), lifelong teaching (Mohammadi Mehr et al., 2012), and massification (Trow, 2007). Various approaches have been proposed to overcome these challenges one of which quality assurance in higher education systems. The quality assurance approach states that since the ideal learning environment is constantly changing, designers of educational philosophy constantly need to review the factors that determine the quality of educational services (Higgins et al., 2005). The importance of technologies in the teaching and learning process becomes more palpable when we know that the community structure is designed or redesigned by these technologies (Campbell et al., 2017). These technologies include online games, iPads, and smart mobile phones, which have entered the teaching and learning

process (Campbell et al., 2017). These technologies play a vital role in fascinating the learning process, so educational researchers emphasize their use in the educational process (Clark and Sampson, 2008). Meanwhile, Hartnell-Young and Heim (2008) argue that using various features of smart mobile phones provides an opportunity for students to learn from outside the classroom as well. Some of these learning opportunities include taking photos of experimental cases, sharing audio and video training files, and exchanging information using web-based software (Hartnell-Young & Heim, 2008). In addition, students can use their smartphones to connect to the learning sites of a university, record instructors' voices during class, and create short videos about subjects (Johnson & Kritsonis, 2007). On the other hand, the expansion of smartphones has allowed the development of Virtual Social Networks (VSNs), which are based on Web 3.0, and has allowed VSN members to exchange information in various types, such as text, video, and photos. VSNs are a type of Information and Communication Technology (ICT) that enhances interaction among individuals and allow teachers, students, and even their parents to collaborate in producing educational content inside and outside the classroom (Greenhow & Askari, 2017). Using social media, teachers and students go beyond face-to-face interactions and can exchange information and knowledge. Instructors and students can use broader ranges of information resources and they can provide feedback on these networks, so their performance will increase in terms of learning outcomes. According to these advantages, the use of VSN is increasingly expanding in teaching and learning processes as an attractive innovation (Greenhow & Askari, 2017).

According to VSNs' role in the construction of co-creation knowledge, on-time access to specialized information contributes to integrating knowledge, developing interpersonal relationships among students and graduates, and removing the boundary between learning, social, and recreational spaces (Manca & Ranieri, 2013). However, no research has specifically focused on examining the strategic position of Iran's agriculture and natural resources in using VSN in the teaching and learning process. There are also several unanswered questions, some of which are as follows: What is the strategic position of Iran's Agricultural and Natural Resources University in using VSN in the teaching and learning process? What are the university's strengths, weaknesses, opportunities, and threats to use VSN in the teaching and learning process? And what are the university's strategies to use VSN in the teaching and learning process? Answering these questions requires a holistic review of previous studies in this domain. Hence, some of the important studies, which comply with the manuscript aims, are reviewed below.

In a feasibility and pathological study on tablet entry into the teaching and learning process, Asadian et al. (2018) indicated that it is not possible to use tablets in the teaching and learning process at the studied schools according to socio-cultural, educational, and organizational aspects. In return, the situation of technological, legal-administrative, and economic dimensions have been in a favorable position to introduce tablets into the teaching and learning process. Moreover, applying explanatory factors analysis and Delphi technic, they identified five fundamental disadvantages of using technology in the teaching and learning process including educational, cultural, environmental, psycho-behavioral, structural, and security disadvantages. *Educational disadvantages* include the complexity of the teaching process, ineffective learning, lower effective interaction and face-to-face communication between teachers and learners, and teachers' inability to effectively convey scientific content. *Cultural and environmental disadvantages* include the introduction of unethical contents and pictures into educational envi-

ronments, isolating students, conducting teaching and learning activities in an individual manner, resisting environmental changes, unwillingness to engage in real work, changing the subcultures that govern the traditional classroom, and exposure to moral and cultural dangers. *Psycho-behavioral disadvantages* include lack of proper understanding of education requirements among schools' top managers, lack of appreciation of teachers for their efforts to teach and produce content. *Structural disadvantages* include such issues as lack of proper understanding of the educational requirements by the officials of educational centers, lack of appreciation of teachers' efforts to teach and produce educational content by authorities, blind imitation of non-native educational systems that do not fit domestic educational conditions, weakness of some educational institutions due to the lack of appropriate information on training, and lack of technical support and advice on technical issues. *Psychological and behavioral disadvantages* include such issues as excitement and stress for learners due to addiction to tablets and smartphones, lack of control on learners and discipline in cyberspace, development of psychosis due to the overuse of tablets and smartphones, addiction to VSNs due to unrelated use of tablets and smartphones during off-hours, and the disorders and effects of these communication devices on the health, body, and mind of learners. *Security disadvantages* include illegal copying and publication of teachers' pamphlets and endangering their job and professional security, hacking of information related to the process of teachers' assessment of students' achievement, inadvertent or intentional leak of personal information in virtual space through tablets and smartphones, the dissemination of users' private information without permission, and the anonymity of the audience on VSNs.

Moradi et al. (2017) listed the most important opportunities of online education as the development of multicultural education, academic freedom, scientific character, expansion of educational coverage, creation of interactive learning environments, and promotion of critical thinking. According to them, the main weaknesses are the spread of scientific dishonesty (whose major forms include collusion, deception, plagiarism, misuse of technology, and misrepresentation of information), breach of privacy, and non-compliance with copyright law. Finally, they argue that web-based education expands education around the world, where learners from all cultures, ethnicities, races, religions, and languages are studying and living together scientifically without prejudice and with mutual respect. Also, online education has been able to lead its audience to such values and attributes as respect, honesty, courage, and self-sacrifice, which are universal, thereby preventing the development of dogmatic and one-dimensional people. In addition, online education improves learners' cognitive development, increases multicultural, racial, and ethnic understanding, and strengthens social sense and civil participation.

In a study on the representation of virtual training challenges in Iran's higher education system with a phenomenological approach, Ghorbankhani and Salehi (2017) showed that these challenges can be identified in five categories including (i) university-related, (ii) instructor-related, (iii) learner-related, (iv) system-related, and (v) class-related challenges. University-related challenges include policymaking and planning (coercion of teachers for virtual teaching, high cost versus available facilities, and lack of virtual courses for majors required by society), lack of response to learners, disorder and inconsistency in holding the main and extra-time classes, lack of orientation and skill courses for teachers and learners (lack of users' mastery will likely affect the quality of the teaching and learning process, which can be identified within the categories of lack of mastery of tools and lack of uniformity in methodology among teachers), and lack of supervising the courses and the content presented. Teacher-related challenges include

teaching method (teachers' teaching methods are different in virtual classrooms so that some teachers have a lot of variety in teaching methods and some just lecture), lack of access to teachers, inattention to the virtual course and learners (discrimination between face-to-face and virtual course learners), insufficient teacher training (insufficient skills of many teachers in using tools and facilities and lack of training of many of them for this type of training), and insufficient information literacy. Learner-related challenges include not attending classes, not taking virtual classes seriously, and not mastery of the system. System-related challenges were identified to include Internet problems, e.g., low speed, high usage volume for users, disconnection and connection of the Internet, and non-allocation of special bandwidth for learners. Also Sedghi Bukani et al. (2015) identified five important challenges of e-learning as follows: pedagogical-behavioral, managerial-structural, economic-cultural, technological, and individual-professional challenges. Their research method was a series of exploratory mix performed by interviewing faculty members and then completing a questionnaire.

Sauers and McLeod (2012) conclude that the use of tablets in educational environments has the following benefits: 1) increasing participation, 2) improving learners' attitude to attend the educational environment, 3) attention to and participation in project-based learning and reducing their sitting on traditional chairs in educational settings, and 4) making more use of independent research and reducing direct learning. They finally state that there is a positive attitude towards using the tablet in educational settings.

Hong and Eun (2010) examined the use of social media technology in higher education by a survey in which a questionnaire was employed. Their research findings showed that many learners have formed very strong social relationships with other classmates and have had a good sense of their learning experiences using VSNs in the classroom.

Garcia-Álvarez et al. (2018) and García et al. (2014) state that virtual learning environments include a set of simultaneous and non-simultaneous tools that enable the development of 'collaborative learning environments'. In other words, non-simultaneous tools (e.g., messaging tools) allow people to communicate with each other at different times without having to respond at the same time. On the other hand, simultaneous tools (such as virtual chat environments) allow different groups to communicate with each other through cyberspace at the same time. The use of these learning environments modifies the feedback processes to achieve a common goal during a training course in the short run, and this feedback process is done by providing more information and resources or changes in the curriculum during the course. In their research, they listed some benefits of using virtual learning environments (such as VSNs) as follows: increasing the quality of learners' learning, ease of access to large amounts of information and knowledge in the world, fast and timely access to information in a short time, reducing some educational costs, improving the quality and accuracy of curriculum and scientific materials, scientific advancement of learners and teachers, creating the necessary conditions for mutual interaction between educators and learners and between learners, forming educational working groups, and using suitable educational technologies. In contrast, Keller et al. (2009) described a set of challenges in using VSNs in the teaching and learning process as follows: poor knowledge of technology, lack of motivational factors and weakness of organizational culture, impossibility of nurturing because of the lack of face-to-face interactions, insufficient information and communication technology infrastructure, lack of teachers' mastery of e-learning methods, non-compliance with global standards of e-learning, lack of support for higher education students that use virtual methods, low trust of some learners

and teachers in VSNs, and low ability of some learners to use web-based technologies (Keller et al., 2009). This study aimed to explain the strategic position of Iran's Agricultural and Natural Resources University to use VSN in the teaching and learning process.

METHODOLOGY

The mixed method research was used to achieve research aims. In the first phase, a semi-structural questionnaire was shown to identify the universities' strengths, weaknesses, opportunities, and threats (SWOT) regarding applying VSNs in teaching and learning processes (28 individuals were interviewed in this stage). SWOT analysis is a significant and effective method used for strategic planning issues (Fertel et al., 2013). It greatly helps in determining VSN strategies in teaching and learning processes, which may increase the strengths and opportunities and decrease the weaknesses and threats. SWOT analysis usually has two key phases: (i) the establishment of the SWOT matrix and (ii) the formation of strategies employing the SWOT matrix. The establishment of the SWOT matrix has two key phases: (i) listing the strengths and weaknesses (internal factors) and (ii) listing the opportunities and threats (external factors). The SWOT matrix essentially comprises strengths-opportunities (SO), strengths-threats (ST), weaknesses-opportunities (WO), and weaknesses-threats (WT) strategies. The purpose is to determine the strengths (internal) and opportunities (external), which are known as SO strategies. The optimal use of opportunities (external) would decrease and/or remove the weaknesses (internal) and are known as WO strategies. The best use of strengths (internal) would decrease and/or eliminate the threats (external) and are identified as ST strategies. Finally, the use of threats (external) could be reduced by addressing the weaknesses (internal) and are considered to be WT strategies (Alptekin, 2013). The conceptual model of the research process is presented in Figure 1. To achieve the research goals, the special case sampling method was used. Special method sampling is a method in which samples are selected according to their important role in employing the research's subject (Stroos, 2008). Special cases are which places or individuals that providing rich information, and when are appropriate to use that it possible to select a small sample. The rationale for special case sampling is that "if it happens here, it could happen anywhere, and vice versa" (Solangi et al., 2019). After interviewing the cases, the content analysis was used to identify the universities' SWOT concerning the implementation of VSNs in the teaching and learning process. Finally, according to the identified SWOT, the strategies were developed (Table 5). Then, the AHP method was used to prioritize the identified strategies. This method commonly comprises two parts: a) establishing pairwise comparisons, and b) ranking the decision alternatives (dos Santos et al., 2018). Twenty-eight experts (who had been interviewed in the previous stage) were consulted to determine their inputs and preferences under the AHP methodology. All these experts were consulted through a webmail service. A questionnaire was provided to these experts, and their opinions were sought about the importance of one criterion to another using Saaty's 1-9 point scale (Solangi et al., 2019).

To confirm the credibility of the findings, we used the following techniques: 1) self-review of findings by research committee during data collection and analysis process; 2) using special coding procedures in the data analysis stage; 3) conducting research by testing row data, data summarization products, and the note-taking process; 4) interviewing faculty members in an individual manner and matching their answers; and 5) using a steering committee to evaluate and conduct interviews. The validity of questionnaires in the quantitative phase was confirmed by faculty members of the department of agricultural extension and education at Khouzestan University. The reliability of the questionnaire was also confirmed by Cronbach's alpha coefficient (0.83 - 0.92) using SPSS software.

RESULTS

Findings of the descriptive statistics showed that the mean age of the respondents was 42.54 (SD = 4.65 and the minimum and maximum ages were 36 and 49 years, respectively. In terms of genderwere male (84.4%). In terms of academic rank, 51 percent were assistant professors, 39 percent were associate professors, and the rest were professors.

To present comprehensive findings and de-

Figure 1. The research conceptual framework

Table 1

Strengths and weaknesses matrix (internal structures for using virtual social networks in Iranian's universities of agriculture and natural resources)

Strange	Weakness
S1: Welcome to share contents on social networks	W1: Sharing non-educational content
S2: Familiarity of students with how to work with virtual networks	W2: Keeping out of the main purpose of the educational subject.
S3: Extensive information for professors and students	W3: Students are far from the scientific environment of the classroom.
S4: Saving time and money	W4: Inaccessibility everyone
S5: solving problems related to curriculum in online VSN by knowledge sharing.	W5: Not commitment to participate in the virtual class
S6: Possibility to hold classes at anytime and anywhere.	W6: Some students do not have access to smartphones.
S7: VSNs speed in transferring information and knowledge	W7: The class managing is difficult.
S8: Reduction in the cost of buying books and pamphlets	W8: Missunderstanding course contents which presenting in righting forms.
S9: Expressing beliefs away from worry and stress	W9: Low quality of presente contents
S10: Increasing the speed of performing learning activities	W10: Lack of laws requiring students and faculty members to participate in such classes.
S11: Sharing knowledge and personal specialized experiences.	W11: Incomplete contents presented in virtual classes
S12: Increasing the speed of learning by increasing the students' self-learning activities.	W12: The incompatibility between some agricultural curriculum contents with the structure of VSNs.
S13: Access to documents at any time and place.	W13: Endangering the job security of faculty members.
	W14: Misuse of some information.
	W15: A waste of time
	W16: Restrictions on communication between students.
	W17: Lack of face-to-face communication

scribe the steps taken in the research process, each of these steps is separately presented with the findings of each section.

Step 1) As described in the Methodology and Conceptual Framework (Figure 1), we used content analysis to identify universities' strengths and weaknesses (internal issues) and opportunities and threats (external issues) concerning the use of VSNs in their teaching and learning process. After comprehensive content analysis of the interviews, we identified 13 strengths and 17 weaknesses (internal issues) and 11 opportunities and 13 threats (external issues) faced by universities to deploy VSNs in the teaching and learning process. These findings are presented in Tables 1 and 2.

The evaluation matrix of external factors related to the use of VSNs in the teaching and learning process is shown in Table 4. The findings show that the most important opportunities of the university in the field of using VSNs in educational activities are getting acquainted with other cultures, getting experts out of the classroom, increasing the speed of access to science, and reducing educational costs. Based on the final score related to each of the external threats, it was identified that the most important threats that agricultural and natural resources universities face in using VSNs in the teaching and learning process are the students' being far from the scientific environment of the classroom, Internet filtering and limited access to the Web, low security of the web environment, and scientific theft. It should be noted that the average final score of external factors (opportunities and threats) is equal to 1.425 and is lower than 2.5. This indicates that the conditions for the use of VSNs in the teaching and learning processes at agricultural and natural resources universities are not favorable due to external opportunities and its threats.

Step 3) determine the strategic position of agricultural and natural resources universities to use VSNs in the teaching and learning process: To achieve this goal, the final scores obtained for each of the four sections of the SWAT matrix (Tables 3 and 4) were used. The chart drawn in Excel software (Figure 2) indicates that universities of agriculture and natural resources are currently in the ST position to use VSNs in the teaching and learning process.

Table 2

Opportunities and threats matrix (internal structures for using virtual social networks in Iranian's universities of agriculture and natural resources)

Opportunities	Threats
O1: Using the information of other universities	T1: Low Internet bandwidth.
O2: Up-to-date information	T2: access to classroom content by other individuals
O3: Access to new knowledge	T3: Low security of the web environment
O4: Awareness of new technologies in education area	T4: Inadequate infrastructure for ICT
O5: Opportunity for scientific promotion	T5: Lack of support from university administrators
O6: Creating new job opportunities	T6: Scientific theft in VSNs by privacy invaders
O7: Ability to communicate with people outside the class	T7: Destructive cultural effects on students
O8: Reducing educational costs	T8: Improper communication in virtual social networks
O9: Increasing the speed of access to science	T9: The attractiveness of other content presented in social networks
O10: Getting acquainted with other cultures	T10: Increasing the use of virtual context and distance from the real-life environment
O11: The arrival of experts from outside the classroom	T11: The destructive effects of the Internet use on health
	T12: High cost of the Internet
	T13: Internet filtering and limited access to the Web

Table 3

Evaluation matrix of internal items (strengths and weaknesses) of agricultural and natural resources universities to use VSNs in the teaching and learning process

Strangest	**Level of importance from 4**	**Wight coefficient**	**Total score**
S4: Saving time and money	3.142	0.036	0.113
S3: Extensive information for professors and students	3.106	0.035	0.11
S6: No need for a specific place	3.106	0.035	0.11
S12: Increasing the speed of learning	3.025	0.034	0.105
S8: Reducing the cost of buying books and pamphlets	3.022	0.034	0.104
S1: Welcoming the share of contents on social networks	3	0.034	0.103
S2: Familiarity of students with how to work with virtual networks	2.991	0.034	0.102
S13: Access to documents at any time and place	2.984	0.034	0.102
S10: Increasing the speed of performing learning activities	2.878	0.033	0.095
S7: VSNs speed in transferring information and knowledge	2.831	0.032	0.092
S5: Solving problems related to curriculum in online VSN	2.705	0.031	0.084
S9: Expressing beliefs away from worry and stress	2.628	0.03	0.079
S11: Sharing knowledge and personal specialized experiences	2.391	0.027	0.065
Total	37.815	0.434	1.269
Weaknesses	**Level of importance from 4**	**Wight coefficient**	**Total score**
W12: The incompatibility of some agricultural curriculum content with the structure of VSNs	3.184	0.036	0.116
W13: Endangering the job security of faculty members	3.172	0.036	0.115
W11: Incomplete content presented in virtual classes	3.147	0.036	0.113
W14: Misuse of some information	3.042	0.034	0.106
W10: Lack of laws requiring students and faculty members to participate in such classes	3.021	0.034	0.104
W9: Low quality of provided content	2.978	0.033	0.101
W1: Sharing non-educational content	2.962	0.034	0.100
W8: Missunderstanding course contents which presenting in righting forms.	2.945	0.033	0.099
W7: Difficulty of class management	2.903	0.033	0.096
W16: Restrictions on communication between students	2.899	0.033	0.096
W6: Some students do not have access to smartphones	2.875	0.032	0.093
W4: Inaccessibility to everyone	2.81	0.032	0.09
W5: Not commitment to participate in the virtual class	2.785	0.031	0.089
W2: Keeping out of the main purpose of the educational subject	2.773	0.031	0.088
W3: Students are far from the scientific environment of the classroom	2.735	0.031	0.085
W15: A waste of time	2.605	0.029	0.077
W17: Lack of face-to-face communication	2.47	0.028	0.07
Total	**49.294**	**0.566**	**1.648**
Mean of final score of internal items 1.458			

Table 4

Evaluation matrix of external items (opportunities and threats) of agricultural and natural resources universities to use VSNs in the teaching and learning process

Opportunities	**Level of importance from 4**	**Wight coefficient**	**Total score**
O10: Getting acquainted with other cultures.	3.184	0.046	0.149
O11: The use of experts from outside the classroom	3.173	0.046	0.148
O9: Increasing speed of access to science	3.147	0.046	0.145
O8: Reducing educational costs	3.021	0.044	0.134
O6: Creating new job opportunities	2.945	0.043	0.127
O5: Opportunity for scientific promotion	2.903	0.042	0.124
O7: Ability to communicate with people outside the class	2.978	0.043	0.123
O4: Awareness of new technologies in education area	2.875	0.042	0.120
O2: Up-to-date information	2.810	0.041	0.116
O3: Access to new knowledge	2.785	0.041	0.114
O1: Using the information of other universities	2.735	0.04	0.110
Total	32.542	0.479	1.422
Threats	**Level of importance from 4**	**Wight coefficient**	**Total score**
T13: Internet filtering and limited access to the Web	3.121	0.045	0.143
T10: Increasing the use of virtual context and distance from the real life environment	3.058	0.045	0.137
T1: Low Internet bandwidth	3.042	0.044	0.136
T3: Low security of the web environment	2.899	0.042	0.123
T11: The destructive effects of the Internet use on health	2.873	0.042	0.121
T6: Scientific theft	2.840	0.041	0.118
T8: Improper communication in virtual social networks	2.710	0.039	0.108
T2: Access to classroom contents by other individuals	2.605	0.038	0.099
T5: Lack of support from university administrators	2.588	0.038	0.098
T4: Inadequate infrastructure in relation to ICT	2.470	0.036	0.089
T7: Destructive cultural effects on students	2.403	0.035	0.085
T12: High cost of the Internet	2.415	0.035	0.085
T9: The attractiveness of other contents presented in social networks	2.302	0.033	0.075
Total	35.335	0.521	1.428
Mean of final score of external items 1.425			

Step 4) Based on the previous steps and the SWOT matrix, strategies of SO, ST, WO, and WT were developed in this step. The SO strategies of the universities to use VSNs in the teaching and learning process include designing domestic virtual networks to advance educational goals, creating virtual classrooms alongside classroom environment to increase the knowledge and experiences exchange, and networking among universities to increase their knowledge and skills exchanges. Establishment of technology centers in the university environment for students to become more familiar with IT businesses, and creating an online database for students and professors to have better access to scientific content in the classrooms and the university. ST strategies of universities to use VSNs include managing students' virtual communications and interactions, the establishment of high-speed Internet by government, culture building among students and teachers to appropriately use web and VSNs, establishing social protection headquarters at universi-

ties, and preventing the harms of social networks, and creating academic websites to reduce the uncertainty of using VSNs at the classroom. Universities' WO strategies to implement SVNs in teaching and learning processes include educating users of the virtual network in the university, providing digital textbooks on the web, holding virtual classes in the leisure time of students and professors, establishing web security, monitoring university's virtual classroom activities, and holding online video conferencing to preventing the lack of visual communication between students and professors. Finally, universities' WT strategies to use VSNs in teaching and learning processes include holding face-to-face classes to ask and answer questions from students about the quality of classes offered on the web, elimination of organized and harmful activities in the social networking environment by the university security, the requirement to attend virtual classes, and cultural building to use web and VSNs. These findings are presented in Table 5.

Step 5) Determining the relative importance of the identified strategies, at this step, as noted in previous sections, the AHP method was used to prioritize the identified strategies. Findings indicate that the ST strategies (0.484) have the highest weight in driving universities towards applying VSNs in their teaching and learning process. The next ranks were for WT (0.231), WO (0.197), and SO (0.088), respectively (Figure 3). Finally, all 25 strategies were analyzed altogether according to the research aim. The weights and ranking of these strategies are shown in Figure 4. The results of these analyses reveal that the ST1 strategy is top-prioritized, followed by ST7, ST3, and ST9 as the second, third, and fourth important strategies, respectively.

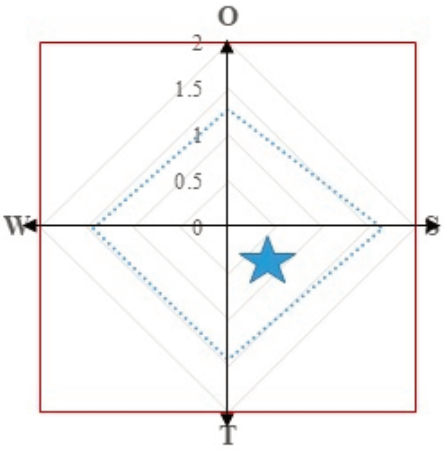
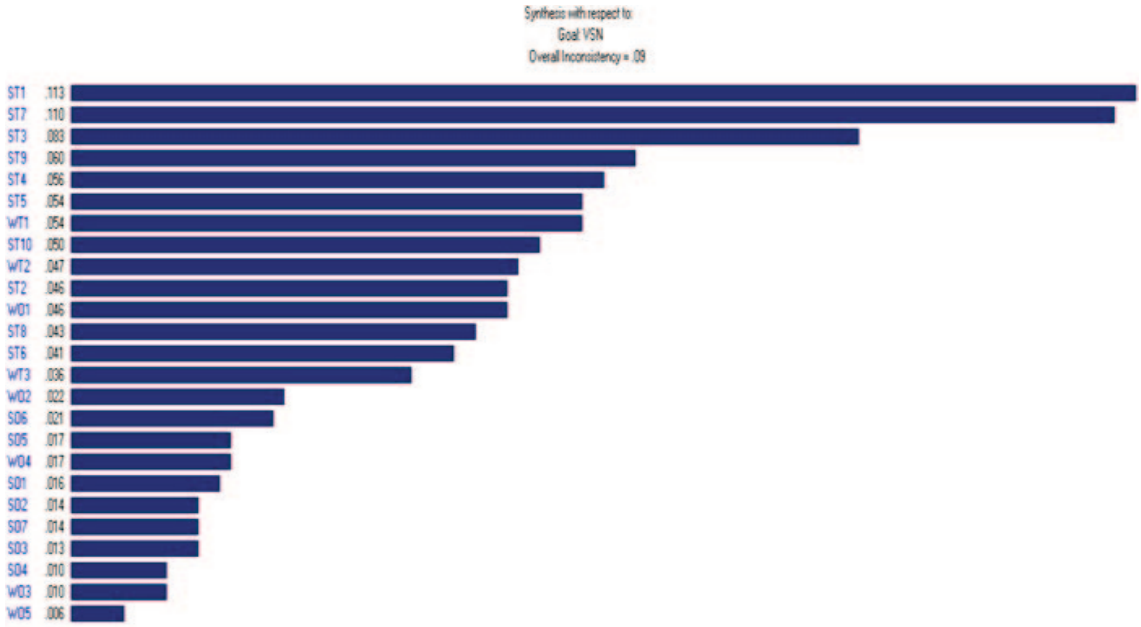


Figure 2. SWOT chart related to the study community to use virtual social networks in the teaching and learning process

Figure 3. The weight and ranking of SO, ST, WT, and WO strategies to integrate VSNs in the teaching and learning process



Figur 4. The weight and ranking of overall strategies according to the research goal

Table 5

Identified strategies to integrate VSNs in the universities' teaching and learning process

S-O Strategies	S-T strategies
SO1- Designing indigence VSNs to advance educational goals	ST1- Managing students' virtual communications and interactions
SO2- Creating virtual classrooms to increase the exchange of content in the classroom environment	ST2- Establishing high-speed Internet at university structure by the government
SO3- Scientific communication between universities to increase knowledge and experience sharing	ST3- Students and staff training to appropriately use web environment
SO4- Establishment of technology centers in the university environment for students to become more familiar with IT businesses	ST4- Determining time limitation for attending virtual classes to prevent possible injuries
SO5- Establishing IT-based businesses in the universities' technology centers	ST5- Establishment of telecommunication towers at universities to increase the quality and speed of the Internet
SO6- Establishing an online database to facilitate students and faculty access to scientific content	ST6- Establishing academic websites to reduce the uncertainty of Internet use
SO7- Holding workshops in the web environment to exchange knowledge with university outside expertise and benefit from their experiences	ST7- Diversifying services and information in the virtual classroom environment
	ST8- Development of government support mechanisms
	ST9- Donating free Internet packages to the students
	ST10- Establishing social protection headquarters at universities to prevent social network harmful
W-O Strategies	W-T Strategies
WO1- Effective education and information management .	WT1- Eliminating organized and harmful activities in the social media environment.
WO2- Providing textbooks digitally on the web	WT2- Requirement to attend virtual classes and provide proof of attendance to university administration.
WO3- Holding online video conferencing to increase virtual classes efficacy	WT3- Holding face-to-face classes to ask and answer questions from students about the quality of classes offered on the web.
WO4- Security development on the web and monitor university virtual classroom activities	
WO5- Holding virtual classes at students and professors leisure times	

DISCUSSION

Output-oriented training requires a lot of effort by educational institutions so that learners can acquire the necessary knowledge, skills, attitudes, and competencies. Achieving this is directly related to the quantity and quality of information and knowledge that has been accumulated in society. Therefore, not only have extensive efforts been made to create and manage knowledge, but efforts have also been spent on developing practical strategies to popularize this knowledge from the personal to the public. Based on this thinking, the statement "knowledge is power" has given its place to "knowledge sharing is power" in the knowledge-centered era. Specifically, in multifunctional organizations like universities (one of the most important functions of which is to effectively teach students and transfer the skills needed to live in the real world), effectiveness widely and profoundly depends on the extent of knowledge sharing among individuals, groups, and units. This has led universities to pay more attention to the use of tools that can help develop knowledge sharing in the teaching and learning processes. The use of VSNs has been identified as an effective strategy in this regard. However, the use of these tools can create opportunities and threats for universities, especially the universities of agriculture and natural resources (given the nature and content of their curriculum). Also, these universities face limitations in using these networks, which have been overlooked by previous research. Therefore, the present study tried to answer the following questions by using systematic and scientific methods: What is the strategic position of Iranian universities of agriculture and natural resources to apply this innovation in the teaching and learning process? What are the strengths, weaknesses, opportunities, and threats of the universities to use VSNs in the teaching and learning process? What are the university strategies for using this technology in the teaching and learning process?

The results showed that the most important strengths of the university in the use of VSNs in educational activities include saving time and money, the lack of need for a specific place, extensive information of professors and students, sharing of knowledge and personal experiences in specialized topics, and access to documents anytime and anywhere. These findings support the results of Al Ghamdi et al. (2016) as to the undeniable role of virtual learning environments in activating interaction between learners and teachers, the results of Edumadze et al. (2017), Sokół et al. (2015), and Berrío-Zapata and Rojas-Hernández (2014) as to the fact that virtual learning environments (such as VSNs) lay the necessary ground for the development of collaborations and the creation of knowledge as a group, and the results of García et al. (2014) and Álvarez et al. (2018) as to the fact that virtual learning environments enable the development of a collaborative learning atmosphere. In fact, it can be said that VSNs provide the basis for mutual interactions between the members by providing an environment for their communication at any time and any place, thereby helping to improve the curriculum and learning process. Likewise, Chang (2016) states that VSNs help to create social capital among learners and users of academic environments and this, in turn, plays a fundamental role in the development of creativity, especially the creativity of learners.

The studied universities have their own weaknesses in the use of VSNs in the teaching and learning processes. The most important weaknesses of the universities in using VSNs in the teaching and learning processes include the incompatibility of the curriculum content of some agricultural disciplines with the structure of VSNs, endangering job security of faculty members, incomplete content presented in virtual classes, misuse of some information, and low quality of content presented. These findings corroborate the report of Asadian et al. (2018) on educational, cultural, and structural disadvantages of using e-learning in academic environments, the re-

port of Moradi et al. (2017) on the effect of using online and e-learning in teaching and learning processes on increasing scientific dishonesty, violation of privacy, and non-compliance with copyright law, and the report of Ghorbankhani and Salehi (2017) on the challenges of using VSNs in the teaching and learning process for universities, educators, and learning. These results indicate that the studied universities are currently facing internal weaknesses in the use of VSNs in the teaching and learning processes and should place more efforts into solving these problems. Some activities that the studied universities can do in this regard include (1) planning for those fields of study whose educational content can be presented through VSNs, (2) dealing with faculty members' concerns about using VSNs and reassuring them about job security, (3) creating the culture of proper use of VSNs among students to not abuse them and have a moral commitment to the privacy of other members of the network, and (4) encouraging faculty members to share and present rich and up-to-date content on academic topics related to curriculum content through the university's VSNs.

Although the use of VSNs in the studied universities poses threats to the teaching and learning processes, it opens up opportunities, too. Some of the most important opportunities are getting to know other cultures, getting experts out of the classroom, speeding up access to science, reducing educational and catering costs, being able to connect with people outside the classroom, and creating new job opportunities in the field of virtual education. Similar findings were reported by Ávlvarez et al. (2018) and García et al. (2014) according to which virtual learning environments include a set of simultaneous and non-simultaneous tools that enable the development of "collaborative learning environments" and approve feedback processes in the short run to achieve a common goal during a training course. In fact, the use of VSNs paves the way for the use of other experts in the teaching and learning processes and the sharing of knowledge between network members. Sharing knowledge among members induces changes in the cognitive construct of individuals so that the learning level of network members is improved and a more comprehensive view of the phenomenon is obtained by combining the acquired knowledge with previous knowledge and creating a newer and more complex cognitive structure. This lays the ground for improving the level and speed of learning among students and faculty members in VSNs and increases the speed of access to science and the creation of new knowledge. In addition, these networks eliminate the restriction of the educator-learner interaction to a specific time and place (classroom).

The SWOT analysis chart shows that the studied universities are in a reformation (ST) position in terms of the possibility of using VSNs in the teaching and learning process. Accordingly, universities need to take steps to reduce external threates through thiers internal strengths. Based on the prioritization of the identified strategies using the AHP process, the use of ST and WT strategies can significantly help the studied universities to use VSNs in the teaching and learning process. The most important strategies identified were as follows: (1) management of communication and virtual interactions of students in virtual networks; (2) culture building for professors and students for the correct and effective use of the web environment; (3) creating appropriate boundaries for the use of the Internet in classrooms to prevent the likely damages to the health; (4) establishment of academic websites to reduce uncertainty about the use of the Internet in the classroom environment and the use of internal websites; and (5) establishment of support mechanisms by the government.

Finally, it should be acknowledged that the findings of this study can help university administrators to plan for the efficient and effective use of VSN technology in the teaching and learning processes and reduce university costs. University educators are encouraged to

develop and present a part of the course topics that are fitted with the structure and atmosphere of VSNs. Also, the results show that the use of VSNs can help improve learning processes and knowledge sharing and create a knowledge community. Most importantly, it fills the research gap in the feasibility study of the use of social networks in the teaching and learning process in Iranian universities of agriculture and natural resources.

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