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Strategies to Improve Teaching-Learning Process in Smart Schools in Terms of Teaching Method

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Abstract

Background: The rapid changes and breakthroughs in technology have affected teaching and learning methods. Accordingly, this study aimed to identify strategies related to teaching methods to improve the teaching-learning process in smart schools in Semnan province.

Methods: This combined exploratory research first employed the qualitative method and then the quantitative method. Interviews and quantitative content analysis were used in the qualitative part, and a cross-sectional survey was used in the quantitative part. The results of the analysis and in-depth study of theoretical foundations were set into the form of a questionnaire made by the researcher. Content validity was determined by experts, and reliability of the questionnaire was determined using Cronbach's alpha coefficient as 0.77 in the desirable status and 0.92 in the status quo. In the quantitative part, the research questionnaire was completed by 310 teachers, principals, and information and communication technology experts who were selected by stratified sampling in the year 2015. For data analysis, chi-square tests with a Friedman significance level of 0.05 and SPSS version 22 were used.

Results: The results showed that collaborative methods of teaching ranked first in utmost importance with an average of 4.53 in the significance level of 0.05, use of educational software in teaching ranked second with an average of 4.29, controlling and directing the class with a variety of teaching-learning strategies ranked third with an average of 4.26, and the student-centered teaching method with an average of 4.15 ranked fourth in improving the teaching-learning process in smart schools.

Conclusions: Based on the results, it can be deduced that the collaborative teaching method and use of educational software in teaching can improve the teaching-learning process in smart schools.

Keywords: Teaching, Learning, Smart Schools, Information and Communication Technology, Teaching Method

1. Background

One of the most basic necessities for the evolution of traditional communities toward the information society is that the education system evolves through the use of information and communication technology. Concurrent with global changes in the fundamental education, information, and communication technology master plan through the strategic planning of Iranian smart schools and implementation of the National Plan in 2011 with style communicated to schools across the country, a new gateway in the education system of the Islamic Republic of Iran has been opened. Information and communication technology is an empowerment key to the development of communities, especially in improving the education and training system. The smart schools plan is an initiative in accordance with the information age that makes fundamental changes in the teaching-learning process by integrating information technology and curriculum (1). The term "smart schools training courses" refers to a group of educational units that work flexibly towards the capabilities and features of students and learners to prepare for the future (2). Education in smart schools seeks to make learning more interesting, exciting, and meaningful for students and involve the mind, spirit, and body of learners in the learning process (3). The introduction of smart schools makes changes in traditional policies, content, curriculum, literacy concepts, the roles of teacher and student, and evaluation methods and techniques (4). This research aimed to identify changes in various teaching methods.

Today, information and communication technology has the ability to facilitate teaching and the learning process (5). The arrival of PCs and widespread access to the Internet has created an environment in which education and training systems worldwide are required to make major changes in their educational structure (6). In fact, there is evidence that information and communications technologies may have the ability to become an effective and flex-

ible method for professional development for teachers in this age of (7). The rapidly occurring technological changes and breakthroughs have influenced not only lifestyle and ways of communicating with others, but also teaching and learning methods. Teaching methods in smart schools are not an exception in this respect. In this regard, identifying teaching method strategies in these schools can improve the teaching-learning process.

Twenty-first century people live in a world where almost everything is different from the past. Each student has individual differences and potential. Teachers should identify students' individual differences and learning styles and choose their own teaching method. Recent studies have shown that when teachers develop their teaching methods and techniques based on their students' individual learning styles, student performance improved significantly (8). Unlike traditional teaching, e-learning emphasizes self-study; therefore, ICT-based teaching methods help teachers and students work toward adopting a learner-centered approach (9). Al-Faki emphasized student-centered teaching methods in e-learning in his research entitled "Saudi teachers' problems in the use of whiteboards in the classroom" (10). Rahim Bahmani et al. studied 346 intelligent primary school students from smart schools in Yasouj. In their report entitled "the impact of smart schools on students' social skills", they emphasized student-centered teaching methods in smart schools (11). Soltani conducted the study "smart school structure in the educational system" in Azerbaijan in which student-centered teaching methods were considered the most important strategies and policies of smart schools (12). The collaborative learning method is a student-centered teaching method. The study entitled "effect of concept mapping, cooperative learning and traditional teaching methods on achievement motivation and academic achievement in biology course" conducted in Varamin by Ashouri et al. showed that cooperative learning increases student achievement in contrast to traditional methods (13). In "comparison of impact of participatory, exploration and lecture teaching methods in the academic achievement of students and their attitudes toward physics", conducted on first year high school girls in Sangar, Abeeri et al. reported significant differences between two collaborative and exploratory teaching methods in academic achievement in physics. In their study, student averages in the collaborative group were higher than in the discovery group (14). The results of several other studies also suggest that collaborative learning leads to improved learning and academic achievement (15-17). It can be concluded that the more collaborative the student-teacher environment is, the greater studentlearning in these schools will be.

A new educational method that can improve the teaching-learning process in smart schools is media or multimedia training (18). Multimedia is considered as an individualized education and is one type of electronic education in which students learn how to learn (19). It is worth noting that with this method of teaching, the learner finds more training opportunities to achieve mastery while engaging the five senses in learning. Moreover, this method facilitates repetition of the course so students can make connections between concepts, and its flexibility can provide opportunities for indirect learning to learners (20). Keong et al. studied smart schools in Malaysia and reported in "application of information and communication technology in mathematics teaching" that the use of information and communication technology in teaching can make the teaching process more effective and enhance the ability of students to understand basic concepts (21). The use of educational software in schools leads to increased interest and motivates students to learn and involving themselves in learning, resulting in faster and better learning (22). The results of Lubis et al. reported in "integration of information and communication technology in teaching-learning process" showed that the use of ICT information and communication technology in teaching increased learning of the Arabic language (1). Tanir conducted a study in the academic year 2013 - 2014 at Anadolu University. In the report "satisfying academics of German language instruction using the smart board" Tanir showed that the use of smart boards is effective in learning the German language (23). Research conducted by Choi et al. and reported in "the effect of communication skills training using video clips in smartphones in the good communications and emotional intelligence in nursing students" concluded that the use of smart video clips is useful for a teaching method (24). In Miranda's "prediction of students' use of teacher-centered technology in elementary classes with multi-level approach", results of a study conducted on elementary students in Turkey, and the research of Taleb and Hassanzadeh entitled "toward a smart school: comparison between smart school and traditional school to learn mathematics," conducted in elementary schools in Yazd, results indicated that the use of educational softwares is more effective on learning than traditional methods (3, 25). Mayer also showed in his book "Multimedia Learning" that the learning of students who are trained with the help of video clips has, on average, been increased compared with students trained with traditional methods (26). Research by Deryakulu et al., also conducted in Turkey and reported in "prediction of students' academic achievement with ICT training method and different learning styles," suggested a positive relationship between academic achievement and methods teaching with informa-

tion and communication technology (27). Barrow et al. studied the benefits of using computers in mathematics education in Chicago. In their report entitled "The ICT-based effectiveness on different courses and levels," they showed that the performance of students in the experimental group (trained in the computer lab) was significantly better than that of the control group (trained in the traditional way) (28). Salimi and Ghonoodi study students in Iran and reported "the study and comparison of curriculum in smart and traditional schools." Their results indicated that the use of information and communication technology in the teaching process has advantages, including the removal of barriers between teachers and students, leads to teacher-student interaction, creates incentives for new teaching methods, and creates an environment in which the teacher-student partnership takes priority over competition (29). Elliot's findings reported in "Multimedia in schools: The study of effectiveness of web-based animation" indicated that students with an ICT-based training perform better and achieve higher scores on final examinations and retests than students trained with traditional methods (30).

Today, the use of new technologies and practices in education and utilizing these practices is proposed. Studies conducted on the use of computers and multimedia in learning represents the expansion in use of these types of instruments in education and training and is indicative of their effectiveness in the learning process. In general, it can be concluded that technology and new media used in smart schools can change and enhance learning environments, attract students to the learning process, inject amplifying triggers to the teaching and learning process, improve the quality of education, and transform traditional educational environments into rich and fun-filled ones.

Based on the cited studies, the continuous rapid growth of science, and the rapid production of knowledge that are increased every day, it can be concluded that traditional methods do not meet the learning needs of modern man and cannot keep pace with the growth of knowledge (1). Therefore, identifying strategies for ICT-based teaching methods in the teaching–learning process of smart schools is necessary. Despite the undeniable importance of ICT-based teaching methods in improving the teaching-learning process in schools, the implementation of these strategies is always faced with barriers and difficulties. The results of Keong et al. in their study "Inhibiting factors of information technology in the teaching process," identified the main barriers to be the lack of hardware and software, shortage of time in school programs to carry out information and communication technology-based projects, lack of knowledge about methods of integrating ICT with curriculum, and the lack of adequate resources at home for students who want to access their educational materials (21). Gladden and Rogushina conducted a study entitled "using smart techniques and semantic web technologies in e-learning environments" in the national scientific telecommunications network and educational institutions of Ukraine. Their results indicated that the growth of learning systems require new, more complicated hardware and software; feedback to the student is always delayed and time-consuming (31). The results of Pelgrum's research entitled "determine the barriers to the integration of information and communication technology in education: the results of the worldwide educational assessment" as well as those of Hamzah et al. entitled "the impact of technological changes on Malaysia's smart school students and teachers of Islamic education" have pointed to inadequate computers, low skills and knowledge of teachers, problems in integrating technology with teaching and its processes, difficulty in adapting to the new teaching role, students' lack of preparation, and the lack of scientific patterns as barriers and challenges to the development of smart schools (32, 33). Omar and Hassan reported their research results in "Malaysia's level of integration of ICT teachers and their perception of impact on the teaching-learning." Their results showed that the integration of information and communication technology in teaching and learning is at a low level. While ICT information and communication technology brought positive results to their teaching, time limits prevent its use. Their results also suggest that the low-level integration of information and communication technology prevents the accomplishment of innovative projects introduced by the Ministry of Education (34). Mohajeran et al. published their research results titled "the main reasons for the lack of proper development of smart schools and providing strategies to their development in the province of Mazandaran from administrators and experts view point." They introduced the lack of integrated planning for the continuous teaching-student learning outside of school hours as an obstacle in the correct formation of smart schools (35).

Today, the need for new teaching methods has been felt because of the increasing progress of science and technology which could turn students from rote memorization toward deeper learning. The increasing importance of addressing the issue of teaching methods and developing a comprehensive framework for teaching in smart school environments has been revealed. In addition to identifying strategies, the current study intended to prioritize each case in education and training, provide efficiency and effectiveness for the teaching-learning process, and generally increase the quality of e-learning. Therefore, the following questions were considered:

1. What strategies relate to teaching methods for im-

proving the teaching-learning process in smart schools?

2. How are strategies related to teaching methods for improving the teaching-learning process in smart schools prioritized?

2. Methods

The combined exploratory research method was used in this study. Combined researches are studies that combine qualitative and quantitative research methods (36). In the qualitative part of this study, interviews and content analysis were used, and in the quantitative part, the survey method was used. In addition to identifying teaching methods to improve the teaching-learning process, the results of this study can be used to improve the status quo. In combined research projects, researchers seek to survey the uncertain status. For this purpose, the researcher must first gather qualitative data. This leads to the description of countless aspects of the phenomena and, ultimately, on the basis of the qualitative data findings, the researcher attempts to collect quantitative data to enable generalization of the findings.

In the qualitative section of the study, general questions are asked in semi-guided interviews to identify the design characteristics of the teaching method used to improve the teaching–learning process. Based on the research objectives and analyses by experts, information and communication technology professionals, teachers, and smart school principals, the participants who could achieve credible results utilizing their knowledge and experience were chosen. The main objective of the semi-guided interviews was to identify teaching strategies to improve the teaching-learning process in smart schools. After conducting interviews, the researchers reviewed the interviews and converted voice to text. As a result, clusters were formed and interviews were revised with regard to each cluster and placement of messages in these clusters and finally, conceptual analysis and description of each cluster were done. Finally, compilation tools for gathering information were confirmed by the people. Benchmarking and review of the experiences of successful countries in the field of smart schools, in-depth study of history and literature of research, and content analyses of six interviews with ICT professionals and 24 semi-guided interviews with teachers led to the identification of 13 factors related to the teaching method. Because of overlap and the integration of some of these factors, the factors were formed into 7 items for implementation into the quantitative part of the study, and the questionnaire was designed in 2 parts: a) demographic information, and b) teaching method strategies for improving the teaching-learning process in smart schools. The desirable status and the status quo were developed with a range of 5 degrees. Two sampling methods were used in the qualitative part of the study.

1) Purposive sampling: based on consultations with the head of the research group of the province's department of education, information and communication technology professionals and experts and teachers and principals of smart schools in the province were identified, some of whom were willing to cooperate with the researchers and be interviewed.

2) Snowball sampling: during interviews with experienced people whom identified in purposeful sampling, they introduced other experienced professionals in this field for developing the sample. This sampling method continued until saturation point was reached.

In the quantitative section, the stratified sampling method was used to complete the questionnaire. The total number of smart school teachers and principals in Semnan province (1640) was determined. Based on Morgan, a sample size of 310 was selected. To select teachers and principals to complete the questionnaire, the share of each city in the province was determined and the sample size for each city was selected for the questionnaire. The numbers were selected by classified sampling using 4 separate cities of Semnan province.

$$I = \frac{n}{N} = \frac{310}{1640} = 0.19 \quad (1)$$

Shahrood = $0.19 \times 645 = 122$
Semnan = $0.19 \times 550 = 104$
Damghan = $0.19 \times 265 = 50$
Garmsar = $0.19 \times 180 = 34$

Content validity was determined by experts in the fields of electronic learning and information and communication technology. To evaluate the reliability coefficients, in the first and experimental stages, 95 questionnaires were distributed among the selected sample population. The reliability coefficient (Cronbach's alpha) is presented in Table 1. The chi-square test (for respondents' comments on each of the items) and the Friedman test (for prioritizing each item in desirable status or status quo) at a significance level of 0.05 using SPSS version 22 were used. Participants were information and communication technology experts, teachers, and principals serving in Semnan province. All respondents participated voluntarily and gave informed consent for participation in the interview and completion of the questionnaire. This study had no financial interest or financial loss for respondents,

and researchers committed to adequately compensate respondents for any financial losses in the course of the research. All respondent information should remain confidential and not be revealed. The benefits and results of this study should be available to all respondents. In this study, people who were not fully aware of the smart schools project and were not willing to cooperate were excluded from the study.

Table 1. Reliability Coefficients of Questionnaire

Number of Items	Desirable Status	Status Quo
7	0.77	0.92

3. Results

The questionnaire was completed by 310 teachers, principals, vice principals, and information and communication technology experts (187 males and 123 females) who were selected using stratified sampling so as to answer the research question, "What teaching strategies improve the teaching-learning process in smart schools?" After careful study of the theoretical foundations and research literature and after content analysis of the interviews, 7 of the most important elements of teaching involved in the improvement of teaching-learning in smart schools were identified, and the views of teachers, principals, vice principals, experts, and information and communication technology professionals were studied. Respondents' views and chi-square test results for both the desirable status and the status quo are presented in Table 2.

P = 0.05 is significant for optimal situations; thus, based on the chi square results, a significant difference was noted between observed frequency and expected frequency. Items 1, 2, 3, 4, 5, 6, and 7 were rated as highly important by 96%, 87%, 100%, 98%, 94%, 90%, and 98% of respondents, respectively.

As can be seen in Table 2, P = 0.05 is statistically significant for the current situation with the freedom of all items related to each item, at 0.05 level is statistically significant. Based on the chi square results, there are significant differences between the observed frequency and expected frequency. The importance of items 1, 2, 3, 4, 5, 6, and 7 on improving the teaching-learning process was rated as low by 52%, 61%, 63%, 63%, 53%, 60%, and 53% of respondents.

Using the chi-square test, the response of members to the 7 items regarding teaching methods for improving the teaching-learning process in smart schools was evaluated. Overall, the importance of all strategies for improving the teaching-learning process related to teaching factors was rated as above average. Furthermore, all strategies for improving teaching-learning from the teaching aspect was rated as below average. The Friedman test was used to compare these methods, rank their importance, and identify the amount of attention to be paid these strategies so as to improve the teaching-learning process in smart schools, and the results are presented in Tables 3 and 4.

Table 3. Friedman Test Results for Ranking the Importance of Teaching Strategies to Improve the Teaching-Learning Process in Smart Schools (Position)[a]

Row	Characteristics of Teaching Methods to Improve Teaching - Learning Process	Average Rank
1	Collaborative teaching method	4.53
2	Using educational software in teaching	4.29
3	Control and guidance of class by types of learning-teaching strategies	4.26
4	Student-centered teaching method	4.15
5	Objectify teaching methods	3.76
6	Taking into account the individual differences of students in teaching methods	3.65
7	Using the Internet while teaching to access the background , providing sample questions from previous years, showing various forms	3.35

[a] $X^2 = 133.605$ (sig = 0.001), $P < 0.05$.

Table 4. Friedman Test Results for Ranking the Importance of Teaching Strategies for Improving the Teaching-Learning Process in Smart Schools (the Status Quo)[a]

Row	Teaching Method Characteristics to Improve Learning-Teaching Process	Average Rank
1	Taking into account the individual differences of students in teaching methods	5.34
2	Objectify teaching methods	4.45
3	Using internet during teaching to access literature, updated information, showing various forms	4.18
4	Student-centered teaching method	4.05
5	Collaborative teaching method	3.81
6	Control and guidance of class by types of learning-teaching strategies	3.46
7	Using educational software in teaching	2.71

[a] $X^2 = 343.007$ (sig = 0.001), $P < 0.05$.

As seen in Table 3, the Friedman test results (chi-square statistic was used to study the significance ranking) were statistically significant with the statistics of $X^2 = 133.605$ at the level of 0.05. Based on the results, the strategies of "collaborative teaching method", "use of educational software in teaching", "controlling and directing class with a variety of teaching-learning strategies", and "student-centered

teaching method" were ranked in first, second, third and fourth place for improving the teaching-learning process in smart schools.

As seen in Table 4, Friedman test results (chi-square statistic was used to study the significance ranking) with the statistics of X^2 = 343.007 were statistically significant at the level of 0.05. Based on these results, the strategies of "use of educational software in teaching", "control and guide the class with a variety of teaching-learning strategies", "collaborative teaching method", and "student-centered teaching method" were rated the lowest in terms of the amount of attention to be given them in improving the teaching-learning smart schools.

4. Discussion

Criteria for the success of any educational system are the use of information and communication technology and ways of utilizing it in teaching. This study aimed to identify and prioritize strategies for improving the teaching-learning process in smart schools as regards teaching methods.

Based on the results, participatory teaching methods have the most importance in improving the teaching-learning process in smart schools. This result is consistent with that of Ashouri et al. (13) who reported that the cooperative teaching method is better than traditional teaching methods in leading to student achievement. Accordingly, the study concluded that the participatory teaching method is one of the most important strategies that should be considered in smart schools. The current results are also consistent with those of Abeeri et al. (14). Their results revealed significant differences between cooperative and discovery teaching in physics with the average of the collaborative group being higher than the discovery group average. The results are also consistent with those of Karmi (15), Stark et al. (16), and Fong Ho and Boo (17). These studies all showed that the participatory teaching method leads to students' academic progress. The current study also demonstrated the great importance of collaborative learning in smart schools. Based on these results and the fact that humans are social creatures, it is recommended that teachers of different subjects apply cooperative learning that correlates with the nature of students and, given the nature of the subject, considers the ability and inclusive interest of the learner, the time needed, and involving learners in class discussions to have the necessary mobility in teaching. The use of a participatory teaching method also activates all class students and their faculty of thought, and this model is effective in improving the country's education.

The results showed that the use of educational software in teaching is ranked second in terms of importance. This result is consistent with that of other researchers such as Mayer (26) who, in his book entitled "The multimedia learning in 2014," showed that the learning of students who are trained with the use of video clips was moderately increase compared with students trained with traditional methods. It is also consistent with the results of Keong et al. (21) who conducted a study in Malaysia in 2005 entitled "Application of information and communication technology in mathematics education." The results of their studies showed that the use of information and communication technology in teaching can make the teaching process more effective and enhance the ability of students to understand basic concepts. The current research has also shown the importance of using ICT in the teaching process. The results of this study are also in line with the results of Lubis et al. (1), who indicated an increase in learning Arabic with the use of information and communication technology in the teaching process, and with the results of Barrow et al. (28) who showed a high performance by students in the experimental group (trained in the computer lab) and the control group (trained in the traditional way). Miranda (25) and Taleb and Hasanzadeh (3) determined that the use of educational software on learning mathematics was more effective than traditional methods; their results are consistent with those of the current research that considered the use of educational software to be very important in the teaching process. Tanir (23) also showed that the use of a smart whiteboard was effective in learning the German language. The study of Salimi and Ghonoodi (29) also suggested that the use of ICT information and communication technology in the teaching process leads to interaction between teachers and students. The results of Elliot (30) confirmed that students who were trained by ICT-based methods had a better performance and higher grades on final exams and re-tests than students trained by traditional methods. The results of these studies are in line and consistent with those of the present study, and they confirm the high importance of the use of information and communication technology in teaching process, the outcome of the current study. Since the purpose of educational technologies is to facilitate and improve learning performance, educational software can help the realization of this goal; therefore, because of the effects of educational software on the attractiveness of a course and learners' academic progress and its implementation in schools being practical, it is recommended that teachers fit their subjects and time so as to make the maximum use of such methods. To familiarize teachers with teaching with educational software, it is further recommended that a training course in such methods be held, and these methods

should be taught by in-service training centers to instructors of different levels of education.

Controlling and directing the class by a variety of teaching-learning strategies was ranked third in importance. Results of the current research are consistent with those of Lorenzo and Lorenzo (8). According to the results, teachers should have a thorough understanding of the elements of learning styles and the learning styles of the students to improve and facilitate the learning process. Attending individual differences in students and employing different teaching strategies cause an overall growth in students' talents and capabilities. Therefore, the use of different teaching methods creates more attractiveness and meaningfulness, engages the mind, body, and spirit of children, and promote creativity and individual abilities in students.

The student-based teaching method was ranked fourth in importance. The results of the current study are consistent with those of Al-Faki and Adam Khamis (10), Rahim Bahmani et al. (11), and Soltani (12), and show the importance of student-based teaching methods. Such method recommends that students establish their learning goals and objectives with their teacher's guidance. Also it is more effective if the instructional assignments be determined by collaboration of students and teacher. In resource determination, students consider their resources and ask their teacher about the survey.

Based on the Friedman test results presented in Table 4, the use of software in teaching, classroom control and guidance with a variety of teaching–learning strategies, collaborative teaching, and student-centered strategies have less importance in improving the teaching-learning process. Despite the importance of these strategies for improving teaching and learning, in practice less attention has been given them. These results are consistent with those of Keong et al. (21), Gladun and Rogushina (31), Pelgrum (32), Hamzah et al. (33), Umar and Hassan (34), and Mohajer et al. (35). Factors inhibiting the use of information technology in the teaching process were identified by these studies as hardware and software shortages, lack of knowledge regarding methods of combining information and communication technology with curriculum, inadequate computers, lack of skills and knowledge of teachers, problems integrating IT with training and its process, problems in adapting to the new role of training, lack of preparedness of students, lack of a valid scientific pattern, low-level performance by teachers in integrating information and communication technology in the teaching process, and the lack of coherent planning to create continued teaching–learning of students outside of school hours. The researchers refer to these components as barriers and challenges to the development of smart schools; therefore, by removing the existing barriers and considering the identified strategies, teaching methods used in the teaching-learning process can be developed and improved.

With the use of information and communication technology in smart schools, it is expected that teaching methods will be interactive and collaborative and multimedia software will be applied taking into account the interests and needs of the students of these schools. Focus on the individual differences of students in teaching and the use of different strategies can improve the effectiveness of teaching methods; thus, it is hoped that using these methods can be a small step toward improving teaching-learning in smart schools.

Based on the findings of this research, it is recommended that the officials of smart schools consider the following procedures to improve the teaching-learning process:

- Employment of teachers with higher academic degrees and familiarity with existent teaching software.

- Informing teachers of the latest findings related to information and communication technology and new teaching methods.

- Extensive interaction with software developers to meet the needs of smart schools.

- Promotion of experiential, research-centered, and student-centered learning in educational processes.

- Providing an environment for students and teachers to participate and engage in the teaching-learning processes.

- Providing a variety of new teaching methods for a variety of talents based on multiple intelligences.

- Continuous and persistent electronic communication with students for fixing bugs, deepening results, and virtually providing guidance and continuity to the teaching-learning process.

- Active participation on the school portal and learning management system to manage the students' learning process of non-presence on the web.

- Providing creativity in teaching methods using educational software and suitable electronic content.

- Students accompany with teachers in the use of electronic content to deepen learning.

- Equip educational facilities with IT hardware and software related to ICT and the employment of personnel qualified to assist and facilitate its use.

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Table 2. Chi-Square Test Results for Strategies of Teaching of Desirable Status and Status Quo

The Importance of the Items on the Improvement of Teaching - Learning Process in Smart Schools(Desirable Status)						Answer Levels	The Attention to Item to Improve the Teaching - Learning Process in Smart Schools (the Status Quo)				
Items	df	Chi-Square	Residual	Expected N	Observed N		Observed N	Expected N	Residual	Chi-Square	df
Objectifyin g the teaching method	4	108.00[a] (sig = 0.001)	62.0	62.0	124	Very low	6	77.5	-71.5	264.27[a] (sig = 0.001)	1
			-24.0	62.0	38	Low	-	-	-		
			-4.0	62.0	58	Medium	6	77.5	-71.5		
			-46.0	62.0	16	High	145	77.5	67.5		
			12.0	62.0	74	Very high	153	77.5	75.5		
Using educational software in teaching	3	170.43[a] (sig = 0.001)	-53.5	77.5	24	Very low	-	-	-	117.019[a] (sig = 0.001)	3
			87.0	77.5	165	Low	6	77.5	-71.5		
			-49.5	77.5	28	Medium	34	77.5	-43.5		
			15.5	77.5	93	High	61	77.5	-16.5		
			-	-	-	Very high	209	77.5	131.5		
Control and guidance of class by types of learning-teaching strategies	4	211.74[a] (sig = 0.001)	-3.0	62.0	59	Very low	-	-	-	12.400[a] (sig = 0.001)	1
			74.0	62.0	136	Low	-	-	-		
			39.0	62.0	101	Medium	-	-	-		
			-49.0	62.0	13	High	124	155.0	-31.0		
			-61.0	62.0	1	Very high	186	155.0	31.0		
Student-centered teaching method	4	115.09[a] (sig = 0.001)	53.0	62.0	115	Very low	6	103.3	-97.3	161.23[a] (sig = 0.001)	2
			19.0	62.0	81	Low	-	-	-		
			-37.0	62.0	25	Medium	-	-	-		
			-49.0	62.0	13	High	117	103.3	13.7		
			14	62.0	76	Very high	187	103.3	83.7		
Collaborative teaching method	4	171.83[a] (sig=0.001)	-44.0	62.0	18	Very low	-	-	-	228.471[a] (sig = 0.001)	2
			84.0	62.0	146	Low	-	-	-		
			-29.0	62.0	33	Medium	16	103.3	-87/3		
			-25.0	62.0	37	High	69	103.3	-34.3		
			14.0	62.0	76	Very high	225	103.3	121.7		
Using the Internet while teaching to access the background , providing sample questions	4	272.67[a] (sig = 0.001)	78.0	62.0	62.0	Very low	6	77.5	-71.5	219.084[a] (sig = 0.001)	3
			-16.0	62.0	62.0	Low	-	-	-		
			58.0	62.0	62.0	Medium	22	77.5	-55.5		
			-59.0	62.0	3	High	122	77.5	44.5		
			-61.0	62.0	1	Very high	160	77.5	82.5		
Taking into account the individual differences of students in teaching methods	3	236.45[a] (sig=0.001)	-62.5	77.5	15	Very low	-	-	-	140.794[a] (sig = 0.001)	2
			72.5	77.5	150	Low	6	103.3	-97.3		
			62.5	77.5	140	Medium	-	-	-		
			-72.5	77.5	5	High	139	103.3	35.7		
			-	-	-	Very high	165	103.3	61.7		

[a] P = 0.05.