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An Investigation into Sociological Factors Affecting Student Learning in Virtual Environment

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ABSTRACT:
The objective of this research was to examine the sociological factors that influence student learning within virtual environments, specifically in Chadegan. A quantitative-exploratory approach was employed, involving the distribution of questionnaires to a sample of 240 lower secondary students in Chadegan, selected through convenience sampling. The data collected was analyzed using SPSS software. Key descriptive findings from the study revealed that 6.9% of respondents came from high economic backgrounds, 70% from above average, 8.81% from below average, and 4.0% from low economic backgrounds. Additionally, 3.8% of students had one to two family members, 54.4% had three to four, 44.6% had five to six, and 6.2% had seven to nine family members. The analysis indicated significant correlations between various factors and learning outcomes. These included the relationship between supervision in virtual education and learning (sig=006, t=2.750), the impact of family stability and quality of life on learning in a virtual setting (sig=005, t=2.815), the effect of intimacy in virtual education on learning (sig=.032, t=2.152), the influence of motivation in a virtual environment on learning (sig=.037, t=2.103), the role of responsibility in virtual education and its impact on learning (sig=.027, t=2.225), and the effect of interaction in a virtual environment on student learning (sig=.042, t=2.050).

Keywords: Learning, Virtual Education, Supervision, Motivation, Family Stability, Responsibility

INTRODUCTION:

The proliferation of information and communication technology has resulted in sweeping changes across every facet of human existence. Educational entities have been at the forefront of these profound shifts (Yazdani, 2009). Both governmental and non-governmental educational bodies are increasingly leveraging the Internet for online education. This mode of education serves as a powerful tool for remote learning, offering a secure and effective communication platform that utilizes information and communication technology. It enables learners to engage in teaching and learning activities regardless of their location or time. Furthermore, online education necessitates contemporary teaching methods, encouraging learners to seek innovative solutions to their challenges (Bates and Poole, 2008, 85).

However, the mere presence of sophisticated technical tools does not ensure the success of virtual education. Consequently, educators have a crucial role in the execution of online education, employing various factors that impact student learning in a virtual setting. Educators have observed that online education often leads students to divert their attention to socializing on platforms like Telegram during class time, rather than focusing on the online lecture, which diminishes their learning outcomes. It appears that significant factors are influencing this phenomenon.

In their study titled "Factors Affecting Success in Electronic Learning in Universities," Eghbal et al. (2015) highlighted that support, organizational policy, and network infrastructure are critical for the effectiveness of virtual learning. The findings revealed that the university's organizational policy, cultural environment, and support systems were subpar. Nazeri and associates (2017), in their research on "Factors Affecting Virtual Learning in Medical Sciences," found that participants prioritized the importance of factors such as management, educational content, teacher resources, rules and regulations, and comprehensiveness.

A multitude of factors can affect students' learning processes, encompassing but not limited to elements such as intimacy, motivation, interaction, supervision, quality of life, family stability, and responsibility. The significance of factors like intimacy, supervision, interaction, motivation, and teacher responsibility in virtual education stems from the recognition that each student possesses distinct and individual traits.

In Iran, insufficient focus on elements such as intimacy, interaction, supervision, and teacher motivation has resulted in students frequently engaging in Telegram groups rather than attending online classes during scheduled lesson times. This has transformed virtual education into a significant challenge for the nation. The current state of the country's educational system, impacted by the coronavirus, provides another compelling reason to concentrate on virtual education. The COVID-19 pandemic has exerted a profound influence on educational institutions, prompting the closure of nearly all schools, universities, and colleges globally. Virtual education presents several advantages over conventional education, including flexibility, the prevention of wasted time, cost savings, and independence from factors like time and location, which are among its most significant benefits.

Considering that Iran faces various crises that can disrupt in-person education and scientific endeavors, members of the Iranian scientific community must gain comprehensive familiarity with virtual education, master its effective use, and overcome its barriers, deficiencies, and adverse effects. This is crucial to ensure that virtual education can be employed to sustain scientific activities during crises and avoid interruptions or delays. By leveraging the potential and benefits of virtual education, the progression of scientific activities in Iran can remain uninterrupted amid various crises, effectively preventing educational problems and issues during such periods. Consequently, the objective of the current research is to examine the sociological factors that impact students' learning within virtual environments.

Theoretical Framework

Learning

Learning is a transformative process that generates practical results and enhances the capacity for better future performance. Education prompts individuals to undergo noticeable shifts in their knowledge, perspectives, or actions. Consequently, learners develop a fresh view of concepts, ideas, or the world and gain a deeper understanding of associated phenomena. Traditionally, learning has been conceptualized in two ways: as behavioral modifications stemming from experience or as internal alterations within an organism triggered by experience, both of which present certain conceptual difficulties. Our perspective characterizes learning as an emergent form of adaptation—behavioral changes in a living being that are the product of the organism's internal organization in response to its environment (Howard et al., 2013).

Virtual Education

Virtual education is a form of teaching that utilizes electronic means such as the Internet, virtual spaces, and computers. This method of instruction is used as an alternative or complement to traditional in-person education and is web-based. In virtual education, there are no physical classrooms; instead, individuals can access their virtual classes and learn from anywhere using electronic devices like smartphones, laptops, tablets, or computers, provided they have an internet connection (Buckley et al., 2021).

In this segment of the research, we delve into theories that are intrinsically linked to the topic at hand, which have been previously introduced and elucidated. These theories encompass functionalism, conflict theory as it pertains to education and inequality, symbolic interactionism in the context of school interactions and behaviors, the theory of multiple intelligences, behaviorism, cognitive learning theory, constructivism, and connectivism.

Of the theories discussed, functionalism, symbolic interactionism, behaviorism, cognitive learning theory, constructivism, and connectivism bear the most conceptual and theoretical relevance to the current study. This is due to their focus on aspects such as the integration process, social assimilation, social learning, the promotion of group work among students, the facilitation of their learning, the implementation of reward and grading mechanisms to bolster learning, the emulation of others' behaviors and its influence on learning, the consequences of labeling on students, interactive engagement in scientific discourse, and the fostering of a close relationship between educators and students, along with their collective impact on the educational and learning processes. In the present research, these elements are scrutinized, and their effects on education and learning are quantified (Zeinolabedini, 2011).

Table 1: Components of Quality in Virtual Learning (Zeinolabedini, 2011)

Authors	Quality Criteria in Virtual Education	Principles for Effective Learning
Chickering & Ehrmann (1996)	Learner interaction, teacher presence, peer collaboration, active learning, feedback during task performance, high expectations, acknowledging diverse talents, different learning styles	• Reducing feelings of isolation, creating a sense of group or community presence • Learner-centered and interactive engagement • Clearly stating the objectives and expectations of the learner • Recognizing individual differences among learners • Continuous assessment
Illinois Technology Foundation (2007)	Support for teaching, clarity in learning objectives, motivation for remote learners, reducing social distance and creating a sense of community, assessment of learning and course content	
Sloan Consortium (2010)	Interactive engagement, quality media, establishing connections and groups, varied teaching methods, student-centered approach, feedback, flexibility	
Policy Institute for Higher Education	Student interaction with teachers and peers,	

(2000)	feedback, appropriate teaching methods, accurate assessment, high-quality technology, student support	and rapid feedback • Encouraging active learning • Evaluating the effectiveness of instructional content • Cultivating interest in students • Adaptability • High-quality technology
Agency for Quality Assurance in Higher Education (1999)	System design, curriculum development, program delivery, instructional support for students, student interaction and presentation, student assessment	
University of Massachusetts Lowell (2003)	Course and content selection and development, faculty support and encouragement, infrastructure, student services design, content, course, and program evaluation	
Nichols (2002)	Personalization, face-to-face interaction, sharing experiences, flexible and clear lesson design, learner feedback, quality of information	
Butcher (2007)	Student-centered approach, interactive engagement, contextual learning, attention to individual differences, learner readiness, high-level cognitive learning, dedicating more time to learning	

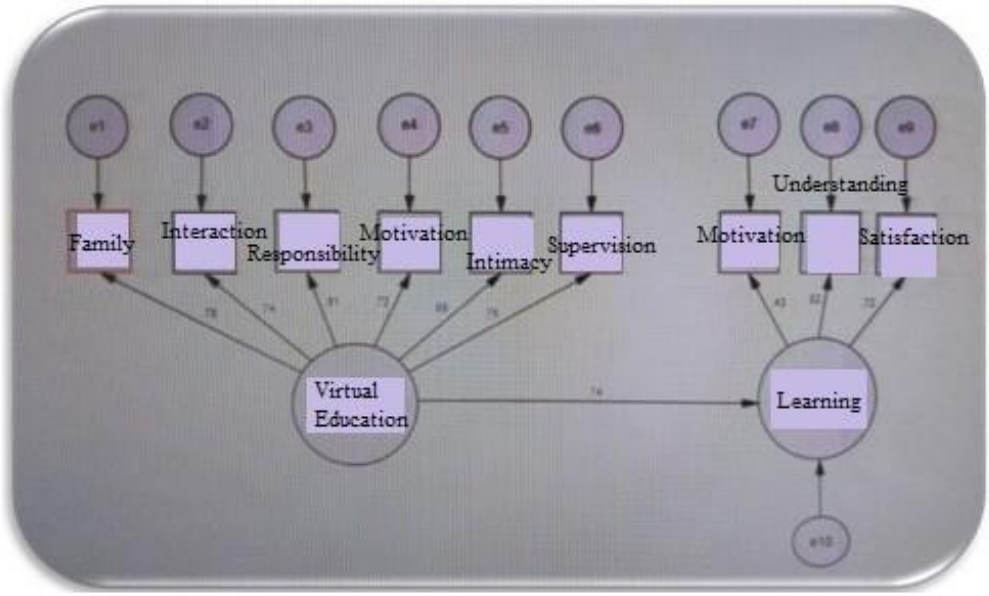

Fig 1: The Hypothetical Model is Researcher-made for the Study According to the Theoretical Framework

A review of past studies reveals that extensive research has been undertaken in the domain of virtual education and student learning, with individual researchers concentrating on diverse factors that impact learning. Certain studies have even highlighted elements such as regional culture and hardware infrastructure. However, the exploration of sociocultural factors that influence student learning within virtual settings has been largely overlooked. Moreover, research dedicated to investigating the impact of various components of virtual education on student learning has not garnered significant attention. This study, therefore, delves into the sociocultural factors affecting student learning in virtual environments and provides a comprehensive analysis (Table 2).

Table 2: Theoretical Roots of the Main Variables

Row	Hypothesis	Main Variable	Theoretical Foundation
1	The motivation of teachers significantly influences the extent of virtual learning achieved by students during the COVID-19 pandemic.	Motivation	1. Acquired Needs Theory: McClelland (early 1950s) (Bigdeli, 2011) 2. Goal Setting Theory: Edwin Locke and Gary Latham (1960s) (Kolahi, 2021) 3. Reinforcement and Behavior Modification Theory: B.F. Skinner (Mousavi and Kafi Masouleh, 1995)

2	Teachers' level of intimacy affects the virtual learning process of students during the COVID-19 pandemic.	Intimacy	1. Interactional and Intimacy Theory: Bakarosi (2001) (Bakarosi, 2001; translated by Atashpour and Etemadi, 2006) 2. Growth and Intimacy Theory: Farman (1999) (Taghvaei and Abkar, 2016) 3. Attachment and Intimacy Theory: Johnson and Whiffen (2003) (Badihi Zeraati and Mousavi, 2016)
3	The interaction of teachers with students plays a crucial role in shaping the virtual learning experience during the COVID-19 pandemic.	Interaction	1. Symbolic Interactionism: Perspective and Method: Herbert Blumer (1969) (Abdoos and Ahmadian, 2017) 2. Symbolic Interaction: George Herbert Mead (1920s) (Anvari, 2011)
4	Teachers' supervision significantly influences the effectiveness of virtual learning for students during the COVID-19 pandemic.	Supervision	1. Social Supervision: Travis Hirschi (2003) (Shafazadeh, 2019) 2. Surveillance and Punishment, Birth of the Prison: Michel Foucault (1975) (Tajzadeh, 2016) 3. Control, Social Supervision, and Religious Revival: Emile Durkheim (Mousavi et al., 2013)
5	Teachers' and students' responsibility has an impact on virtual learning by students during the COVID-19 pandemic.	Responsibility	1. Social Cognitive Learning Theory and Responsibility: Albert Bandura (1977) (Ebrahimzadeh et al., 2016)
6	The quality of life of students has a significant effect on their ability to engage with virtual learning during the COVID-19 pandemic.	Quality of Life	1. Social Learning Theory and Quality of Life (Naghdi and Babaei, 2016) 2. Social Action Theory of Parsons and Quality of Life (ibid) 3. Social Status and Quality of Life, Max Weber (Abdoli, 2014) 4. Structuration and Quality of Life, Anthony Giddens (ibid) 5. Modern Culture and Quality of Life, George Simmel (ibid)
7	The stability of students' family life plays a pivotal role in their capacity to adapt to and succeed in virtual learning during the COVID-19 pandemic.	Family Stability	1. Homogamy Theory: Hill (1945) (Bakhshi and Alimondegari, 2017) 2. Spillover and Compensation Theory: Louis Kriesberg (1973) (Naseri et al., 2018)

RESEARCH METHOD

This research employs a descriptive and quantitative methodology. The target population encompasses all male students at the lower secondary level who have undergone virtual education during the academic years 2019-2020 and 2020-2021. Given the limited size of the study population, a census will be conducted instead of sampling, ensuring that all individuals are included in the analysis. Data from the Education Department indicates that there are 150 students in total. The instrument used for data collection is a researcher-made questionnaire. To evaluate the reliability of the data, this study will utilize Cronbach's alpha coefficient and convergent reliability measures, as detailed in Table 3.

Table 3: Factor Loadings and Cronbach's Alpha for Research Variables

Row	Variable	Factor Loading	Cronbach's Alpha
1	Motivation	0.72	0.73
2	Intimacy	0.68	0.74
3	Interaction	0.74	0.85
4	Supervision	0.75	0.72
5	Responsibility	0.61	0.84
6	Quality of Life and Family Stability	0.78	0.71
7	Understanding Educational Content	0.82	0.70
8	Satisfaction with Learning	0.72	0.77
9	Interest and Motivation for Learning	0.43	0.70

SPSS software was employed to analyze the data collected for this research.

FINDINGS

Within the study's 240-participant sample, the distribution across grades is as follows: 30.8% are in seventh grade, 37.5% in eighth grade, and 31.7% in ninth grade, with all participants enrolled in public schools. Regarding the most recent GPAs, approximately 40% of the respondents have scores below 15, 10% fall between 15.01 and 16, 26.3% range from 16.01 to 17, 10.4% are between 17.01 and 18, 6.3% are from 18.01 to 19, and 7% are between 19.01 and 20. The paternal occupational breakdown is

as follows: 68.3% are self-employed, 1.7% work in the medical sector, 2.9% are in cultural professions, 25.4% are employees, and 1.7% are unemployed. Maternal occupations are distributed with 9% self-employed, 1.3% in the medical field, 6.3% in cultural professions, 9.6% as employees, and 73.8% as homemakers. Table 4 provides descriptive statistics for the study's dependent and independent variables.

Table 4: Regression Analysis (ANOVA)

Model		Sum of Squares	Degrees of Freedom	Mean Square	F-Statistic	Significance Level (Sig)
1	Regres	14778.	6	2463.	22.63	.000[b]
	sion	202		034	0	
	Residual	25033.444	230	108.841		
	Total	39811.646	236			

This table demonstrates that our regression model accounts for 14,778 units of variance, while the sum of residuals, representing the prediction errors, amounts to 25,033. The combination of these figures equals the total variation, which is roughly 39,811 units. A Sig value below 0.05 confirms the adequacy of the regression model.

Table 5: Standardized and Unstandardized Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	sig	Linear Statistics	
		B	Error	Beta			Tolerance	VIF (Variance Inflation Factor)
1	Constant Values	18.892	3.070		6.155	.000		
	Supervision	.371	.135	.197	2.750	.006	.535	1.869
	Family Stability and Quality of Life	.322	.114	.213	2.815	.005	.476	2.102
	Intimacy	.317	.147	.144	2.152	.032	.610	1.638
	Motivation	.203	.096	.153	2.103	.037	.515	1.940
	Responsibility	-.151	.068	-.145	-2.225	.027	.647	1.545
	Interaction	.277	.135	.151	2.050	.042	.501	1.998

The standardized Beta column reveals that the variable of family stability and quality of life (Beta = 0.213) serves as the most potent predictor of the dependent variable. Subsequently, the variables of teacher supervision (Beta = 0.197), motivation (Beta = 0.153), interaction (Beta = 0.151), and intimacy (Beta = 0.144) follow, with responsibility (Beta = -0.145) being the last. These values hold significance as the Sig value for each coefficient falls below 0.05. The impact of these variables on student learning, the dependent variable, is direct for supervision, family stability and quality of life, intimacy, motivation, and interaction. This implies that an increase in these independent variables correlates with an increase in student learning. Conversely, responsibility exhibits an inverse relationship with the dependent variable, indicating that an increase in responsibility results in a decrease in student learning, as shown in Table 5.

Table 6: Multicollinearity Diagnostics

Model	Dimensions	Eigenvalues	Index	Variance Proportions						
				Constant Values	Supervision	Family Stability and Quality of Life	Intimacy	Motivation	Responsibility	Interaction
1	First	6.743	1.000	.00	.00	.00	.00	.00	.00	.00
	Second	.062	10.431	.04	.01	.03	.61	.10	.09	.02
	Third	.055	11.072	.23	.00	.01	.00	.15	.14	.30
	Fourth	.041	12.853	.38	.02	.44	.18	.04	.08	.00
	Fifth	.040	12.955	.08	.41	.01	.19	.01	.43	.00
	Sixth	.033	14.295	.14	.13	.02	.01	.48	.01	.59
	Seventh	.026	16.072	.13	.44	.48	.01	.22	.26	.08

Table 6 facilitates the identification of multicollinearity. Within the Eigenvalues column, figures surpassing 15 are indicative of mild multicollinearity, while those exceeding 30 point to severe multicollinearity. In the present table, a single value of 16.72 stands above 15, hinting at a potential for minimal multicollinearity due to its proximity to 15. All remaining values fall below 15, denoting the absence of multicollinearity in those particular dimensions.

Table 7: Paired Samples Statistics

		Mean	N	Standard Deviation	Standard Error Mean
Pair 1	Interaction	22.2259	239	7.10480	.45957
	Dependent Variable (Student Learning)	48.5230	239	12.95169	.83778
Pair 2	Intimacy	17.4125	240	5.93344	.38300
	Dependent Variable (Student Learning)	48.4125	240	13.03747	.84156
Pair 3	Supervision	24.5063	239	6.90565	.44669
	Dependent Variable (Student Learning)	48.4519	239	13.05052	.84417
Pair 4	Family Stability and Quality of Life	28.2218	239	8.65765	.56002
	Dependent Variable (Student Learning)	48.4310	239	13.06168	.84489
Pair 5	Responsibility	44.0958	240	12.51657	.80794
	Dependent Variable (Student Learning)	48.4125	240	13.03747	.84156
Pair 6	Motivation	31.7500	240	9.85013	.63582
	Dependent Variable (Student Learning)	48.4125	240	13.03747	.84156
Pair 7	Independent Variable (Composite of Factors)	168.5696	237	38.86570	2.52460
	Dependent Variable (Student Learning)	48.5823	237	12.98820	.84367

Based on the means, responsibility is more important than the other components of the independent variable, and the other components in order of priority are motivation, family stability and quality of life, supervision, interaction, and intimacy (Table 7).

Table 8: Paired Samples Test

		Paired Differences					t	Degrees of Freedom	Sig
		Mean	Standard Deviation	Standard error	95% Confidence Interval				
					Upper	Lower			
Pair 1	Interaction - Dependent	-26.30	11.528	.74570	-27.77	-24.83	-35.265	238	.000
Pair	Intimacy -	-31.00	11.597	.74862	-32.45	-29.53	-41.410	239	.000

2	Dependent								
Pair 3	Supervision - Dependent	-23.95	11.265	.72870	-25.38	-22.51	-32.861	238	.000
Pair 4	Family Stability and Quality of Life - Dependent	-20.21	11.515	.74484	-21.68	-18.74	-27.132	238	.000
Pair 5	Responsibility - Dependent	-4.32	15.555	1.00405	-6.29	-2.34	-4.299	239	.000
Pair 6	Motivation - Dependent	-16.66	12.266	.79176	-18.22	-15.10	-21.045	239	.000
Pair 7	Independent - Dependent	119.99	33.650	2.18581	115.68	124.29	54.894	236	.000

Table 8 indicates that the Lower and Upper values for the collection of independent variables, at a 95% confidence level, span from 115.68 as the minimum to 124.29 as the maximum. Given that both bounds are positive, zero is not encompassed within the confidence intervals. Consequently, the data presented in the table demonstrates that, at a 95% confidence level, the array of factors about online education exerts a substantial influence on the online learning process of students.

DISCUSSION

This study aims to illuminate the sociological factors that affect student learning within virtual settings. Findings reveal that a collection of independent variables influences the online education of lower secondary students in Chadegan during the COVID-19 pandemic. A significant correlation exists between these variables and student learning outcomes, evidenced by a computed t-value of 54.89—which exceeds the critical t-value of 1.96—indicating the impact of independent variables on online learning with 236 degrees of freedom in two-tailed tests at a 0.05 significance level. Consequently, the null hypothesis suggesting no variance between the sample mean and the population mean is dismissed. With 95% confidence, a substantial difference between the two means is established. In terms of effectiveness, the independent variables are shown to influence online learning.

These results align with the conclusions of Yazdani et al. (2015), which underscore the profound impact of electronic education on student learning. From the viewpoint of educators, electronic education not only exerts a significant and positive influence on student learning but also has a marked positive effect on student motivation and attitudes.

Additionally, the study by Hashemi et al. (2016) illustrates that the implementation of effective distance education models, such as Reigeluth's Four-Component Instructional Design, can significantly benefit from the multimedia effect to reduce cognitive load, facilitate the understanding of scientific concepts, and boost academic motivation. These models are effective in alleviating cognitive load and enhancing students' scientific proficiency and motivation, ultimately enhancing the educational system's quality. Broadly, earlier research has suggested that various factors influence student learning in online environments. By recognizing these factors and adopting suitable strategies, educators can reinforce the online learning approach, making it a viable and supplementary option to traditional classroom instruction. By employing the right techniques to address the factors impacting online learning, this method can serve as a dependable and efficient substitute for in-person education during emergencies.

The findings suggest a substantial correlation between teacher motivation and student engagement in online learning. This observation aligns with the study conducted by Zamani and Talepasand (2017), which demonstrated that motivational and behavioral aspects significantly influence student achievement, academic effort, and self-assurance. By enhancing these motivational elements within students, educators can foster a sense of endeavor, resolve, and tenacity in their learning, encourage a focus on tasks, direct them toward extracurricular pursuits, and instill a lasting commitment to their studies.

The interaction between teachers and students has an impact on the online learning of lower secondary students in Chadegan during the COVID-19 pandemic. The results of the research by Shafiei et al. (2021) are consistent with the present study, indicating that the analysis of how the interaction between teachers and students is created on the SHAD network showed that most of the interviewed subjects stated that most teachers in online classes only publish the text of the lesson or present the lesson in a visual or auditory manner. Students also only listen to the teacher, and the teacher does not allow students to ask questions during the lesson, and questions are raised at the end of the class. In addition, students cannot speak during the lesson, and interaction in this method is in the form of a lecture, and students do not interact with each other. This method is not suitable according to many researchers in this field, and students should have constructive interaction with each other in the classroom.

According to the respondents, the relationship between educators and students has a significant impact on online education. This observation is supported by the research conducted by Ghasemi and Dadres (2015), which highlighted that a major challenge for teachers in the classroom is achieving effective and appropriate communication with their students. Meaningful interaction is crucial for classroom management and is

the cornerstone of the learning process, encompassing a range of indicators. Key factors that greatly influence student learning and should be addressed by teachers include engaging with students' parents, viewing the classroom as a community, cultivating a warm and welcoming educational atmosphere, recognizing both formal and informal dynamics, and nurturing a relationship of mutual respect between teacher and student. In summary, by fostering effective emotional bonds within the classroom, educators can significantly improve the educational outcomes for students across a spectrum of intellectual capabilities.

According to the respondents, the oversight provided by teachers in online learning environments significantly influences student education. This perspective is supported by the findings of Behrangi et al. (2013), which demonstrated that teacher supervision enhances the quality of student learning. Consequently, a supervision approach that is teacher-focused, collaborative, and interactive—rather than direct—proves to be highly effective in improving the quality of student learning, thereby reflecting an enhancement in teacher effectiveness.

The respondents also believe that the sense of responsibility shared by both teachers and students in online learning is a critical factor. This belief is corroborated by the research of Saemi et al. (2014), which found a correlation between student responsibility and academic burnout, with responsibility being a key predictor of burnout among students. Furthermore, this view is echoed in the findings of Aghili and Nasiri (2014), which established a link between learning strategies and documentation styles, indicating that learning strategies are indeed associated with a sense of responsibility.

According to the respondents, the stability of the family unit and the quality of life of students are factors that influence their online learning experience. This observation is in agreement with the findings of Ghorbani (2016), which identified several key elements affecting the development of intelligence, including motivation, the economic status of students, educational resources, study habits, and the role of the family in these aspects. Parents are esteemed for their collaboration and support of teachers in furthering their children's education, particularly during the middle school years. With a deeper understanding of effective educational and parenting techniques, parents can offer their children invaluable assistance.

The findings suggest that by leveraging the outcomes of this research, we can prevent a decline in student learning should online education be reintroduced in schools. Implementing these insights will expand teachers' understanding of online teaching strategies, enabling them to prepare for and deliver successful, impactful virtual instruction. As a result, they will play a pivotal role in enhancing the educational outcomes for students.

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