Virtual Education in Islamic Azad Universities of Sistan and Baluchestan Province: Identifying Components and Outcomes

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Abstract

The objective of this study is to identify the components and outcomes of virtual education in Islamic Azad Universities of Sistan and Baluchestan Province. This research employs a mixed-methods approach (qualitative-quantitative) with an exploratory sequential design. In the qualitative phase, the grounded theory method was applied, while the quantitative phase utilized a survey method. In the qualitative phase, the research sample consisted of 20 experts in the field of educational management, selected using criterion-based purposive and snowball sampling methods. Semi-structured interviews were conducted with these individuals. In the quantitative phase, the statistical population comprised students of Islamic Azad Universities in Sistan and Baluchestan Province (28,811 individuals), from which a sample of 379 students was selected using random sampling. The research instrument in the quantitative phase was a researcher-developed questionnaire, designed based on the theoretical model derived from expert opinions in the qualitative phase. For qualitative data analysis, MAXQDA software and Straussian grounded theory were employed, while quantitative data were analyzed using structural equation modeling. The components of virtual education included types of virtual education, characteristics of teaching methods, and assessment of education, with the characteristics of virtual teaching methods having the most significant impact. The outcomes of virtual education encompassed both positive and negative consequences, with positive outcomes carrying the highest factor loading. Overall, the findings of the quantitative phase confirmed the results of the qualitative phase. The results of this study emphasize the necessity of strengthening the characteristics of virtual teaching methods to enable individuals to use this space effectively and consciously. Moreover, positive outcomes play a more central role in the present analysis, which can be instrumental in designing policies and strategies to mitigate negative outcomes.

Keywords: *Education, Virtual Education, University, Islamic Azad University, Sistan and Baluchestan.*

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1. Introduction

In today's world, digital technologies and modern communication tools have profoundly transformed all aspects of human life. One of the most significantly affected areas is the education system. Virtual education, which refers to online and distance learning processes, has rapidly replaced traditional in-person education methods in many parts of the world [1, 2]. This type of education, facilitated by digital technologies and the internet, enables students and instructors to access educational resources and courses from any location and to continue their learning process without the need for physical presence in classrooms [3-5].

Furthermore, with the rapid advancement of technology and the digitalization of various industries and professions, universities can no longer remain indifferent to modern trends and must adapt their educational methods to the new demands of the labor market. In this context, virtual education serves as an effective tool, providing universities with the opportunity to update their curricula and, in line with technological advancements, impart new skills to their students. As the labor market evolves rapidly, universities must employ methods that prepare students for emerging challenges and modern job requirements. Virtual education not only allows universities to update their curricula but also enables students to become familiar with new tools and skills in the digital world, ultimately making them better prepared for the workforce [4].

In the era of globalization, universities are no longer limited to enrolling local students but seek to attract international students from around the world. Virtual education facilitates this process by enabling universities to reach students globally without geographical constraints and to expand their educational programs on an international scale. This feature not only allows universities to access a broader range of students but also strengthens international academic collaborations. Moreover, this type of education enables universities to significantly increase their capacity and offer a wider variety of courses to an international audience (Perkins et al., 2022).

One of the primary challenges facing universities today is the ability to respond to rapid transformations and changing demands. The modern world requires educational models that can quickly adapt to existing changes. In this regard, virtual education offers numerous advantages for universities. It allows them to swiftly update courses and maintain continuity in education even during crises or emergencies, such as pandemics or natural disasters. For instance, during the COVID-19 outbreak, many universities were able to continue their educational activities through online platforms and prevent the closure of in-person classes. This high degree of flexibility in virtual education is a major advantage, particularly during critical situations, enabling universities to adapt to rapid changes and unpredictable circumstances [6, 7].

Given that universities often face limitations such as space constraints, human resources, and infrastructure, online education presents an effective solution to address these challenges. This educational model enables universities to expand their capacity for student enrollment without the need for additional physical infrastructure or new buildings. Since online classes are conducted remotely, universities can accommodate a larger number of students in various programs. This is particularly crucial for institutions aiming to offer diverse and globally accessible courses [8].

Global developments such as pandemics or natural disasters can lead to university closures and restrictions on in-person classes. In such situations, a model is needed that ensures the continuity of education without disruption. Virtual education provides an optimal solution by allowing courses to be conducted online and remotely, making it an essential strategy for universities during crises. This model enables universities to sustain education during emergencies without interruptions in students' learning processes [9].

Additionally, given the intense competition among universities to attract more students, adopting innovative educational models such as online education can provide a significant competitive advantage. Universities can increase their global presence and enroll more international students by offering extensive online courses. This initiative not only enhances the academic reputation of universities but also helps them secure more financial resources to strengthen their educational infrastructure [10].

One of the most pressing challenges in many societies is the limited access to higher education due to economic, geographical, or social constraints. Virtual education can serve as a tool to mitigate these inequalities. This educational model allows individuals in remote areas or economically disadvantaged regions to access high-quality education and benefit from equal learning opportunities. Since online education is not restricted to a specific location, students from diverse economic backgrounds can utilize these opportunities, ensuring equitable access to education [7].

In today's world, where technology and digitalization have influenced all economic and social sectors, the demand for digital skills in the workforce is greater than ever.

Universities, as centers of knowledge and skill development, must actively participate in equipping students with these competencies. Integrating online platforms into education can assist universities in teaching digital skills, preparing students for future professional challenges [11, 12].

Another critical feature of virtual education is the facilitation of lifelong learning. This model enables individuals to continuously access educational opportunities without time constraints. It is particularly advantageous for those who, due to various reasons, cannot attend in-person classes. Working professionals or individuals facing other limitations can continue their education through online courses and benefit from lifelong learning opportunities [6].

Research on virtual education has explored its challenges, opportunities, and outcomes across different contexts. Makela et al. (2020) investigated the shift to online learning during the COVID-19 crisis, highlighting its benefits in terms of flexibility and time efficiency but also noting its detrimental effects on education quality [13]. Al-Balas et al. (2020) focused on medical distance education in Jordan, reporting positive outcomes such as time savings and increased flexibility [13]. Meanwhile, Al-Fraihat et al. (2017) identified key success factors for virtual education implementation in higher education institutions, emphasizing cost reduction for students, diversification of virtual education programs, and the need for varied assessment methods [14]. Studies conducted in Iran [15-21], have similarly examined the positive and negative consequences of virtual education, while Sheikh et al. (2022) specifically assessed evaluation methods in virtual education [21]. Collectively, these studies underscore the dual impact of virtual education, highlighting both its advantages, such as accessibility and cost efficiency, and its challenges, including decreased student engagement and assessment difficulties.

Ultimately, virtual education allows universities to effectively enhance the quality of education and skill development among students without physical limitations, responding to evolving labor market demands and technological advancements. Simultaneously, this educational model can serve as a tool for reducing global educational disparities by ensuring equal learning opportunities for individuals worldwide. Sistan and Baluchestan Province is the largest province in Iran in terms of geographical area and suffers from significant deprivation in telecommunications infrastructure. Challenges such as limited access to high-speed internet due to the province's vastness, particularly in rural and border areas, as well as cultural restrictions imposed by parents on students' use of virtual spaces and media literacy challenges, have hindered the province's achievement of an optimal level of virtual education. Additionally, proximity to neighboring countries and security concerns pose further obstacles to internet accessibility. Based on these considerations, the present study aims to address the following research questions:

1. What are the components of virtual education in Islamic Azad Universities of Sistan and Baluchestan?
2. What are the outcomes of the virtual education system in Islamic Azad Universities of Sistan and Baluchestan?
3. Do the collected data align with the theoretical models of components and outcomes?

2. Methodology

This study employs a mixed-methods approach (qualitative-quantitative) with an exploratory sequential design. The qualitative phase utilizes the grounded theory method. The research population consists of all experts and scholars in the fields of educational management and virtual education. Sampling in the qualitative phase was conducted using purposive sampling with criterion-based and snowball selection techniques. The selection criteria included possessing one or more of the following qualifications: being a faculty member in the field of educational management or having experience teaching online courses; being a researcher in educational studies or related research on virtual education in universities; and having a minimum of three scientific-research articles in this domain. The sample size was determined based on data saturation. In this study, the researcher identified data saturation at the 18th interview but continued to the 20th interview for confirmation.

Data were collected through semi-structured interviews. The interviews were scheduled in advance and conducted in person, lasting between 30 to 70 minutes, with audio recordings. The collected data were analyzed using the Straussian Grounded Theory (SEG) approach through open, axial, and selective coding with the assistance of MAXQDA software. Data analysis was conducted concurrently with data collection.

To ensure research trustworthiness (reliability), the study adhered to Lincoln and Guba's (1985) four criteria: credibility, transferability, dependability, and confirmability. Additionally, to verify the accuracy of coding and categorization, one of the interviews coded by

the researcher was given to an educational expert for independent coding. The agreement rate between the expert's coding and the researcher's coding, calculated using MAXQDA software, was 85%, indicating a high level of inter-coder reliability.

The quantitative phase employed a survey method, and data analysis was conducted using structural equation modeling (SEM) with confirmatory factor analysis (CFA) using SPSS 23 and LISREL 8.57 software. The statistical population for this phase included students of Islamic Azad Universities in Sistan and Baluchestan Province (28,811 individuals), from which a sample of 379 students was randomly selected.

The research instrument for the quantitative phase was a researcher-developed questionnaire based on the theoretical model derived from expert opinions in the qualitative phase. To establish face validity, the questionnaire was reviewed by a focus group comprising the research supervisor and advisors, who provided feedback on structural deficiencies. Content validity was assessed by five experts in educational management and virtual education, who suggested necessary modifications and additional indicators. Construct validity was verified through factor analysis.

Cronbach's alpha coefficient was used to determine the reliability of the questionnaire. Since all dimensions had Cronbach's alpha values above 0.70, the questionnaire demonstrated acceptable reliability. The factorial structure of the components and outcomes of virtual education was examined through factor analysis. Additionally, model-data fit and measurement model testing were conducted using confirmatory factor analysis.

3. Findings and Results

To address the research questions, both qualitative and quantitative analyses were conducted. The qualitative section employed an exploratory approach based on grounded theory to identify and extract categories, components, and codes. In axial coding, the interview transcripts and open codes were reviewed again, and relationships between concepts were examined. Based on this analysis, Table 1 was developed:

Table 1. Codes Derived from Open, Axial, and Selective Coding

Category (Selective Coding)	Concept (Axial Coding)	Codes (Open Coding)
Components of Virtual Education	Implementation of Virtual Education Types	Collaborative Virtual Education - Problem-Based Virtual Education - Learner-Centered Virtual Education - Role-Playing Virtual Education - Modeling-Based Virtual Education - Project-Based Virtual Education
	Characteristics of Teaching Methods	Possibility of modifying teaching methods - Ability to diversify virtual education programs - Moving towards personalized learning for students
	Education Assessment	Continuous assessment of instructors and students - Use of various evaluation methods (tests, projects, etc.)
Outcomes	Positive Outcomes	Time-saving - Reduction in student expenses (transportation, materials, clothing, etc.) - Decrease in accidents - Inclusion of diverse student groups (working students, disabled individuals, etc.) - Knowledge production and dissemination - Expansion of virtualization - Increased access to education, materials, and resources - Flexibility in learning - Deepened and sustained learning with improved quality - Development of media literacy skills among students - Enhancement of media literacy skills among instructors
	Negative Outcomes	Reduced social interactions and changes in interaction patterns - Physical health issues and sedentary lifestyle - Boredom - Virtual addiction - Time-wasting - Access to unethical content - Weakening of religious beliefs - Social isolation - Decline in family interactions - Lack of innovation - Decreased efficiency and job burnout among instructors - Academic decline - Increase in unproductive behaviors - Decrease in education quality

To determine whether the data fit the components of virtual education, confirmatory factor analysis was used. The tested model for virtual education components is shown below:

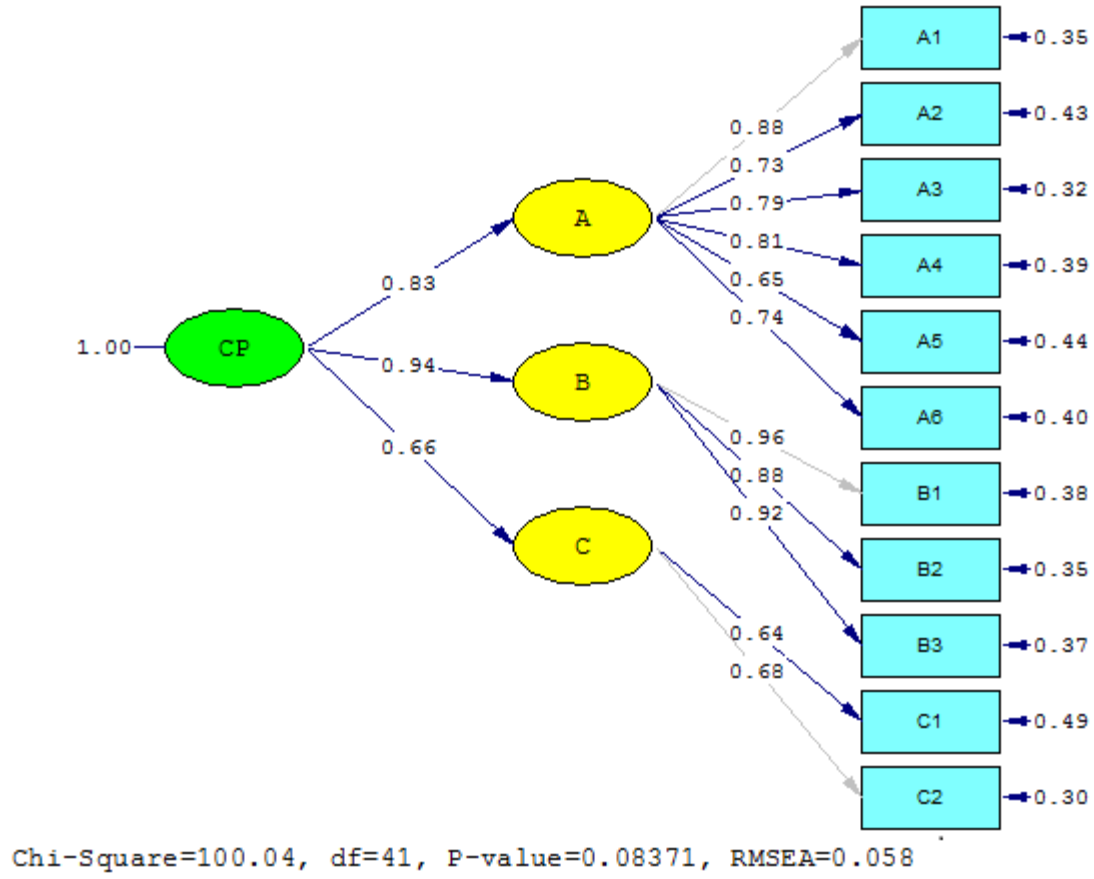

Figure 1. Measurement Model for Virtual Education Components in Standardized Coefficients

Implementation of Virtual Education Types: A, Characteristics of Teaching Methods: B, and Education Assessment: C.

Model fit indices indicate that the measurement model for virtual education components is appropriate, with an RMSEA value of 0.058, which is below the 0.10 threshold, indicating an acceptable mean squared error of approximation. Additionally, the chi-square to degrees of freedom ratio is below 3. The goodness-of-fit indices (GFI, AGFI, and NFI) are 0.95, 0.97, and 0.93, respectively (Figure 1). These fit indices suggest that the data align well with the model. The factor loadings obtained for each component—implementation of virtual education types, characteristics of teaching methods, and education assessment—were 0.83, 0.94, and 0.66, respectively. The factor loadings for each indicator ranged from 0.64 to 0.96.

To assess whether the data fit the outcomes of virtual education, confirmatory factor analysis was also applied. The tested model for virtual education outcomes is shown below:

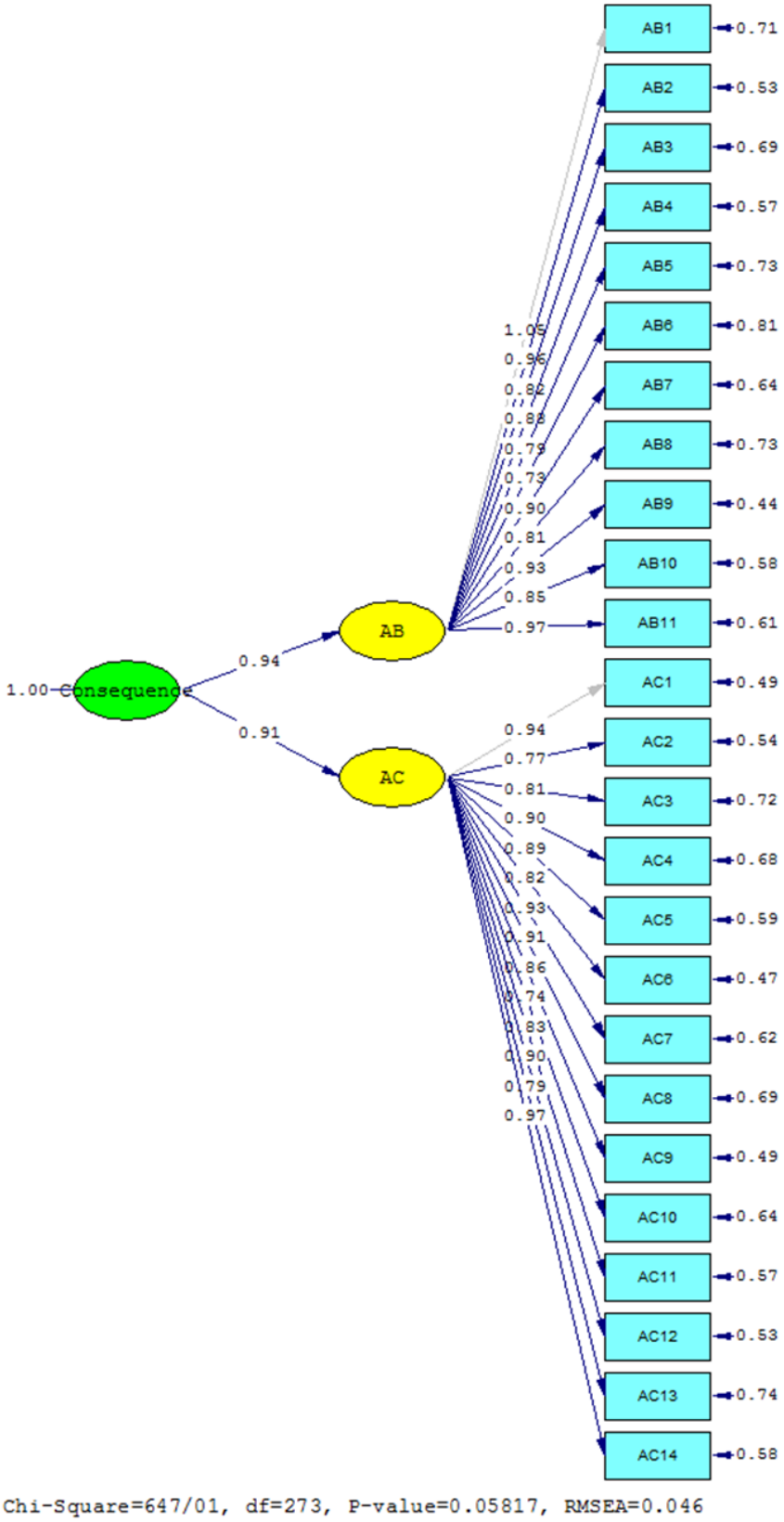

Figure 2. Measurement Model for Outcomes in Standardized Coefficients

Model fit indices indicate that the measurement model for virtual education outcomes is appropriate, with an RMSEA value of 0.046, which is below the 0.10 threshold, indicating an acceptable mean squared error of approximation. Additionally, the chi-square to degrees of freedom ratio is below 3. The goodness-of-fit indices (GFI, AGFI, and NFI) are 0.95, 0.99, and 0.96, respectively. These fit indices suggest that the data align well with the model. The factor loadings obtained for each outcome were 0.94 and 0.91, respectively. The factor loadings for each indicator ranged from 0.71 to 1.05.

4. Discussion and Conclusion

The research findings indicate that the measurement models for virtual education components and their outcomes demonstrate an acceptable fit both in standardized estimation and in terms of significance in first-order and second-order analyses. Since the model fit indices fall within an acceptable range, the models are confirmed. The confirmation of first-order models, which reflect the relationship between latent variables and observable indicators, as well as the second-order models, which include two latent layers, validates the accuracy of these structures. Overall, the results confirm the validity and precision of the models in assessing the intended dimensions. Additionally, in terms of significance, the models exhibit an acceptable level of statistical significance.

In the measurement model for virtual education components, the obtained factor loadings for different dimensions of these components indicate a strong and meaningful relationship between each dimension and the overall model structure. The varying factor loadings for the components—types of virtual education (0.83), characteristics of teaching methods (0.94), and education assessment (0.66)—highlight the significance of different variables in the educational model. The higher factor loading for the characteristics of teaching methods (0.94) suggests that these features have a direct and extensive impact on the learning process in virtual education, as teaching methods, interactions, and technology use play a crucial role. The types of virtual education (0.83) also have a significant impact, though slightly less than teaching methods due to their diversity and complexity. Education assessment (0.66) has a lower factor loading, as assessments in virtual education may not be as influential as teaching methods and are more dependent on other educational model characteristics. These differences correspond to the priorities and implementation challenges of each component in designing and executing virtual education.

The factor loadings for positive and negative outcomes (0.94 and 0.91, respectively) indicate a strong model fit and a substantial correlation between these components and other aspects of the educational model. The higher factor loading for positive outcomes (0.94) suggests that these outcomes have a significant impact on the model's results, reflecting the positive effects of virtual education on learners, such as skill enhancement and increased motivation. Negative outcomes (0.91) also have a high factor loading, though slightly lower than positive outcomes, indicating that adverse consequences, such as boredom and social isolation, are also meaningfully considered within the educational model. The range of factor loadings for indicators, between 0.71 and 1.05, suggests varying degrees of influence on the model, with some indicators having higher factor loadings (close to 1), indicating stronger effects, while others have lower factor loadings, suggesting weaker influences.

In terms of outcomes, the studies [6-8, 10-12, 15-23] align with the findings of this section.

Based on the research results, it is recommended that various types of virtual education be implemented according to the needs and capabilities of instructors and students in Islamic Azad Universities of Sistan and Baluchestan Province. Additionally, efforts should be made to diversify virtual education programs and personalize them for long-term use, while incorporating diverse student assessment methods.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

All procedures performed in this study were under the ethical standards.

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