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Identifying Components of Virtual Learning Culture in Higher Education Institutions

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A B S T R A C T

Purpose: The objective of this study is to identify the key components essential for fostering a virtual learning culture in higher education institutions. By understanding these components, the study aims to provide insights that can help institutions enhance the effectiveness and inclusiveness of their virtual learning environments.

Methodology: This qualitative research utilized semi-structured interviews to gather in-depth insights from 12 experts in higher education and virtual learning. Participants were selected using purposive sampling based on their extensive experience and knowledge in the field. Data were collected until theoretical saturation was achieved and analyzed using NVivo software, which facilitated the organization, coding, and interpretation of the qualitative data.

Findings: The analysis revealed several critical components categorized into structural and behavioral factors. Structural factors included software and hardware infrastructure, design and management of virtual learning interactions, virtual learning environment setup, virtual learning development, and operational support capability. Behavioral factors comprised culture building, individual attitudes, and learner motivation. The study highlighted the importance of robust digital infrastructure, effective teacher-student interactions, cultural inclusiveness, and the provision of continuous support and empowerment for both educators and learners.

Conclusion: The findings underscore the multifaceted nature of virtual learning culture in higher education, emphasizing the need for comprehensive strategies that address both structural and behavioral components. Institutions must invest in the necessary infrastructure, foster effective interactions, provide empowerment courses, and build a supportive culture to create an engaging and inclusive virtual learning environment. These insights can guide the development of policies and practices that enhance the quality and effectiveness of virtual learning, ultimately improving educational outcomes for all students.

Keywords: *Virtual learning culture, higher education, virtual learning environments, digital infrastructure, teacher-student interactions, cultural inclusiveness, learner motivation, operational support.*

1. Introduction

in recent years, the advancement of technology has revolutionized the educational landscape, particularly through the introduction and integration of virtual learning environments (VLEs) in higher education (Alberto Aning, 2020; Amiri et al., 2023; Elhamifar et al., 2019; Paripour et al., 2020; Putro, 2023; Ram & Esmaeili Shad, 2018; Zeinabadi & Mosavi, 2019). The shift towards digital learning platforms has been accelerated by various factors, including the global COVID-19 pandemic, which necessitated a rapid transition to online education to maintain educational continuity (Nowfeek & Rupasinghe, 2022). This transition has brought to light both the potential benefits and the challenges associated with virtual learning, prompting a closer examination of the components that contribute to a successful virtual learning culture in higher education institutions.

Virtual learning environments offer a multitude of advantages, such as increased accessibility, flexibility, and the ability to cater to diverse learning needs (Chau et al., 2013). The use of three-dimensional virtual world learning environments, for instance, has been shown to enhance students' engagement and perception of their learning experience (Chau et al., 2013). Additionally, the integration of augmented reality (AR) and virtual reality (VR) in experiential learning has provided students with immersive and interactive educational experiences that were previously unattainable in traditional classroom settings (Jantjies et al., 2018).

However, the transition to virtual learning is not without its challenges. One significant issue is the digital divide, which perpetuates cultural and socio-economic elitism in higher education by limiting access to those who are less privileged (Sims et al., 2008). The disparity in access to technology and digital resources can hinder the effectiveness of virtual learning and exacerbate existing inequalities. Furthermore, the success of virtual learning environments is heavily dependent on the acceptance and engagement of both students and educators. Factors such as user acceptance, cultural inclusiveness, and the readiness of educational institutions to adopt and integrate new technologies play critical roles in the effectiveness of VLEs (Keller, 2009; Lu, 2016).

Cultural inclusiveness in online learning environments is essential to ensure that educational technology can meet the diverse needs of students from different backgrounds. Lu (2016) emphasizes that educational technology must be designed and implemented in a way that accommodates cultural differences and promotes inclusivity. This is particularly important in a globalized education system where students from various cultural backgrounds participate in virtual learning environments (Lu, 2016).

The role of educators in facilitating virtual learning is also crucial. Educators' perceptions of and attitudes towards virtual learning can significantly influence the implementation and success of these platforms. According to Delia (2022), educators' perceptions of the identity challenges faced by refugee students in virtual learning environments highlight the need for supportive measures to address these challenges (Delia, 2022). Similarly, Falola et al. (2020) discuss the moderating influence of virtual learning supports on the relationship between emotional intelligence and faculty engagement, underscoring the importance of providing adequate support to educators to enhance their engagement and effectiveness in virtual learning environments (Falola et al., 2020).

In addition to cultural inclusiveness and educator support, the design and management of virtual learning interactions are vital components of a successful virtual learning culture. Hollyhead, Edwards, and Holt (2012) explore the use of VLEs and social network site-hosted forums in higher education, demonstrating that these platforms can facilitate meaningful interactions between students and educators. These interactions are crucial for fostering a sense of community and collaboration in virtual learning environments (Hollyhead et al., 2012).

Moreover, the quality of virtual higher education is a critical factor that influences its success. Mahdiuon, Masoumi, and Farasatkhah (2017) propose a grounded theory approach to quality improvement in virtual higher education, highlighting the need for continuous assessment and enhancement of virtual learning programs to ensure their effectiveness (Mahdiuon et al., 2017). Similarly, Bautista (2024) presents a framework for the adaptive learning of higher education students in virtual classes, utilizing machine learning to tailor educational content to individual learning needs and preferences (Bautista, 2024).

The implementation of virtual learning environments also requires robust technical and operational support to address the various challenges that may arise. Quick response to student requests, technical ability to resolve issues, and the provision of necessary tools and resources are essential for maintaining the functionality and reliability of VLEs (Menta, 2022). Additionally, the establishment of secure and stable communication networks is critical for facilitating

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uninterrupted online interactions and ensuring data security (Kovtoniuk et al., 2022).

Despite the numerous advantages and potential of virtual learning environments, there are still significant barriers to their widespread adoption and effectiveness. The digital divide remains a persistent issue, and efforts must be made to bridge this gap to ensure equitable access to virtual learning opportunities for all students (Smith, 2022). Furthermore, the success of virtual learning depends on the readiness of educational institutions to embrace and integrate new technologies, as well as the willingness of students and educators to adapt to these changes (Jeffrey et al., 2014).

In conclusion, the transition to virtual learning in higher education presents both opportunities and challenges. The successful implementation of virtual learning environments requires a multifaceted approach that addresses the structural and behavioral components essential for fostering a virtual learning culture. By examining the experiences and perceptions of educators and students, this study aims to identify the key components that contribute to an effective virtual learning culture in higher education institutions. The insights gained from this research can inform the development and implementation of strategies to enhance the quality and inclusiveness of virtual learning, ultimately improving the educational outcomes for all students.

This study draws on the insights from various scholars and practitioners in the field of virtual learning. The integration of VLEs, AR, and VR in higher education, the importance of cultural inclusiveness, the role of educator support, and the necessity of robust technical infrastructure are all critical factors that contribute to the success of virtual learning environments. By addressing these factors, educational institutions can create a supportive and engaging virtual learning culture that meets the diverse needs of their students and prepares them for the challenges of the digital age.

2. Methods and Materials

2.1. Study Design and Participants

This qualitative research aims to identify the components of the virtual learning culture in higher education institutions. The study utilized semi-structured interviews as the primary data collection method to gain in-depth insights from experts in the field.

The participants of this study were 12 experts in higher education and virtual learning. These experts were selected using purposive sampling to ensure they had extensive experience and knowledge relevant to the research topic. The selection criteria included significant experience in virtual learning, holding substantial positions in higher education institutions, and a willingness to share their experiences and insights in semi-structured interviews.

2.2. Data Collection

Data were collected through semi-structured interviews, which allowed for flexibility in exploring various aspects of virtual learning culture while maintaining a consistent framework across interviews. The interview guide included open-ended questions designed to elicit detailed responses about the participants' experiences, perceptions, and insights regarding the virtual learning culture. Interviews were conducted until theoretical saturation was achieved, meaning no new information or themes emerged from additional interviews. This approach ensured that the data collected was comprehensive and representative of the participants' experiences.

2.3. Data Analysis

The collected data were analyzed using NVivo software, which facilitated the organization, coding, and interpretation of qualitative data. The analysis process involved several steps. First, all interviews were transcribed verbatim to ensure accuracy and completeness of the data. The transcribed data were then coded into meaningful categories using NVivo, identifying recurring themes, patterns, and concepts related to the virtual learning culture. These codes were grouped into broader themes that represented the key components of the virtual learning culture. The themes were reviewed and refined to ensure they accurately reflected the data. Finally, the themes were interpreted in the context of the research questions and the existing literature, providing a comprehensive understanding of the virtual learning culture in higher education institutions.

3. Findings and Results

The study involved 12 participants, whose demographic characteristics are summarized as follows. In terms of gender, 70% of the participants were male (n = 8), and 30% were female (n = 4). Regarding age distribution, 20% of the participants were under 35 years old (n = 3), 40% were between 35 and 45 years old (n = 5), and another 40% were 45 years or older (n = 4). Concerning educational

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background, 20% of the participants held a Master's degree (n = 3), while the remaining 80% had a Doctorate (n = 9). As for work experience, 20% of the participants had between 10 to 20 years of experience (n = 3), and 80% had over 20 years of experience (n = 9). In total, the study included 12 participants, accounting for 100% of the sample.

Table 1

Results of Qualitative Analysis of Interviews

Axial Coding (Categories)	Open Coding (Indicators)	Interviewee Code
Structural Factors / Software and Hardware Infrastructure	Access to digital resources and required software for e-learning	I1, I8
	Building a network to connect everyone to the university	I1, I3, I5
	Creating and using necessary infrastructure for online interaction	I3
	Access to digital resources and texts	I9, I8, I1, I5
	Providing suitable technical and communication infrastructure	I1, I9
	Creating and using necessary infrastructure for online interaction	I3, I2, I10
Structural Factors / Design and Management of Virtual Learning Interactions	Proper interaction between teacher and student	I2, I4, I5, I12
	Improving self-regulation and autonomy among students	I2, I12, I5
	Employing precise evaluation strategies by the teacher	I4, I5
	Ability to choose teachers and learning resources	I2, I5
Structural Factors / Design and Management of Virtual Learning Interactions	Continuous access to the instructor and assistant	I2, I12
	Trust in mutual relationships with the instructor	I3, I4
	Providing necessary tools and equipment for both teachers and students such as laptops and advanced smartphones	I2, I4, I5
	Student participation in discussion groups in forums	
Structural Factors / Virtual Learning Environment Setup	Prerequisites for e-learning in the higher education system	I2
	Establishing a unified system for virtual education	I3, I6
	Answering questions from both learners and instructors	I2, I3
	Designing a suitable website for the learning environment	I2, I3, I12
	Existence of a secure and stable communication network	I2, I3, I5
	Interaction and control in the educational structure	I12
	Setting up to offer courses via video conferencing	I2
	Changing traditional teaching methods and using new virtual teaching methods	I1
Structural Factors / Virtual Learning Development	Conducting empowerment courses for instructors	I2, I10, I9
	Conducting empowerment courses for learners before starting the course	I2, I6
	Long-term investment in higher education to achieve quality	I2, I10
	Creating self-control among students for selecting educational content	I2
	Using user feedback and suggestions with a participatory approach	I2, I6, I10
	Providing educational programs to create and develop technology knowledge and skills	I1
Structural Factors / Operational Support Capability	Quick response to student requests	I8, I7
	Technical ability to respond to requests	I8, I5
	Creating repeatability and problem-solving capability	I8, I6
	Existence of formative feedback on student progress	I8, I6
	Online and offline educational support	I6
Behavioral Factors / Culture Building	Necessary cultural motivations for learning	I4, I6
	Proper culture building for effective use of virtual higher education capacities	I1, I2, I4
	Increasing awareness of the value of virtual education	I2
	Efforts to portray virtual learning outcomes positively	I6, I4
	Support for new virtual teaching methods	I6
	Training managers for the virtual environment	I6
	Evaluating the quality of electronic curriculum consistent with societal culture	I6, I4, I9
	Using well-known and reputable figures to launch and establish the virtual education system	I1
Behavioral Factors / Individual Attitudes	Incorrect attitudes towards virtual courses	I1, I9
	Fear of lack of attention to learner evaluation	I1

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Behavioral Factors / Learner Motivation	Creating attractive content	I9, I11, I5
	Using graphics and multimedia in virtual education	I9
	Flexibility in time for educational activities	I9, I11, I7, I5
	Creating diverse course materials by instructors	I9, I11
	User acceptance of the system (user issues related to ancillary processes of the system)	I9
Behavioral Factors / Learner Motivation	Categorizing students based on their abilities and different learning styles	I11
	Customizing course content to match student needs and interests	I7, I11

The qualitative analysis of the interviews identified several key components essential for fostering a virtual learning culture in higher education institutions. These components were categorized into structural and behavioral factors.

3.1. Structural Factors

Software and Hardware Infrastructure: Access to digital resources and required software for e-learning was frequently highlighted by the interviewees. One participant noted, "Having the necessary software and digital resources is fundamental for any e-learning system" (I1). Additionally, building a network to connect everyone to the university was emphasized, as stated by another participant, "A well-connected network is the backbone of our virtual learning environment" (I3). The importance of creating and using necessary infrastructure for online interaction was also underlined by several experts, with one mentioning, "Interactive infrastructure is crucial for engaging students effectively" (I3).

Design and Management of Virtual Learning Interactions: Proper interaction between teachers and students was identified as a critical factor. One interviewee remarked, "Effective communication between instructors and learners forms the essence of a successful virtual learning experience" (I4). Improving self-regulation and autonomy among students was also deemed important, as noted by a participant, "Encouraging students to self-regulate enhances their learning experience" (I2). Precise evaluation strategies by teachers were highlighted, with one expert stating, "Accurate assessments by instructors are vital for maintaining academic integrity" (I5). The ability to choose teachers and learning resources was another key element, reflecting the sentiment, "Flexibility in choosing instructors and materials can significantly impact student satisfaction" (I2).

Virtual Learning Environment Setup: The prerequisites for e-learning in the higher education system were discussed, with one interviewee stating, "Establishing clear prerequisites for e-learning helps set the stage for effective education" (I2). The creation of a unified system for virtual education was also emphasized, as another participant mentioned, "A single, cohesive system for virtual education can streamline the learning process" (I3). Answering questions from both learners and instructors was deemed essential, with an expert noting, "Timely responses to queries are crucial for maintaining engagement" (I2). The design of a suitable website for the learning environment was also discussed, with one participant saying, "A well-designed website enhances the overall learning experience" (I3).

Virtual Learning Development: Empowerment courses for instructors and learners were frequently mentioned, with one participant noting, "Empowerment courses are essential for preparing both teachers and students for the virtual learning environment" (I2). Long-term investment in higher education to achieve quality was also highlighted, as an interviewee remarked, "Sustainable investment is key to ensuring the quality of virtual education" (I10). Creating self-control among students for selecting educational content was another important factor, with a participant stating, "Encouraging self-selection of content fosters independence and engagement" (I2).

Operational Support Capability: Quick responses to student requests were considered vital, with one participant noting, "Prompt responses to student inquiries are crucial for maintaining trust and engagement" (I8). The technical ability to respond to requests was also highlighted, as another interviewee mentioned, "Technical support must be robust to handle various requests efficiently" (I8). The capability for repeatability and problem-solving was emphasized, with an expert stating, "Being able to address issues and provide repeatable solutions is fundamental" (I6).

3.2. Behavioral Factors

Culture Building: Necessary cultural motivations for learning were frequently discussed, with one participant noting, "Cultivating the right cultural motivations is essential for effective virtual learning" (I4). Proper culture building for effective use of virtual higher education

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capacities was emphasized, as another interviewee mentioned, "Building a culture that supports virtual learning is crucial for its success" (I1). Increasing awareness of the value of virtual education was also highlighted, with a participant stating, "Raising awareness about the benefits of virtual learning can drive its adoption" (I2).

Individual Attitudes: Incorrect attitudes towards virtual courses were identified as a barrier, with one interviewee stating, "Misconceptions about the value of virtual courses need to be addressed" (I1). The fear of lack of attention to learner evaluation was also mentioned, as another participant noted, "There is a concern that virtual courses may not be evaluated as rigorously" (I1).

Learner Motivation: Creating attractive content was highlighted as crucial, with one participant noting, "Engaging content is key to keeping learners motivated" (I9). The use of graphics and multimedia in virtual education was also emphasized, as another interviewee mentioned, "Incorporating multimedia can enhance the learning experience" (I9). Flexibility in time for educational activities was considered important, with a participant stating, "Flexibility in scheduling allows students to learn at their own pace" (I11).

4. Discussion and Conclusion

The findings of this study revealed several key components essential for fostering a virtual learning culture in higher education institutions. These components were categorized into structural factors, such as software and hardware infrastructure, design and management of virtual learning interactions, virtual learning environment setup, virtual learning development, and operational support capability, as well as behavioral factors, including culture building, individual attitudes, and learner motivation.

Access to digital resources and necessary software emerged as a critical factor. This finding aligns with the work of Jantjies, Moodley, and Maart (2018), who emphasized the importance of technology in enhancing experiential learning through virtual and augmented reality (Jantjies et al., 2018). Building a robust network to connect everyone to the university was also highlighted, echoing the sentiments of Kovtoniuk et al. (2022), who stressed the need for secure and stable communication networks in virtual learning environments (Kovtoniuk et al., 2022).

The proper interaction between teachers and students was identified as crucial for the success of virtual learning. Hollyhead, Edwards, and Holt (2012) support this finding, demonstrating that VLEs and social network site-hosted forums can facilitate meaningful interactions, thereby fostering a sense of community and collaboration (Hollyhead et al., 2012). Improving self-regulation and autonomy among students was also noted, which aligns with the findings of Bautista (2024), who presented a framework for adaptive learning that tailors educational content to individual learning needs, thereby enhancing self-regulation (Bautista, 2024).

The establishment of prerequisites for e-learning, a unified system for virtual education, and a suitable website design for the learning environment were deemed essential. These elements are consistent with the recommendations by Mahdiuon, Masoumi, and Farasatkhah (2017), who proposed continuous assessment and enhancement of virtual learning programs to ensure their effectiveness (Mahdiuon et al., 2017). Moreover, the importance of answering questions from both learners and instructors and providing tools and resources for effective online interaction were highlighted, supporting the findings of Menta (2022) regarding the necessity of robust technical and operational support (Menta, 2022).

Empowerment courses for both instructors and learners were frequently mentioned as necessary for successful virtual learning implementation. This finding aligns with Delia (2022), who highlighted the importance of supportive measures for educators to address identity challenges faced by students in virtual learning environments (Delia, 2022). Long-term investment in higher education to achieve quality was also emphasized, echoing the sentiments of Falola et al. (2020) on the need for sustained support to enhance faculty engagement in virtual learning contexts (Falola et al., 2020).

Quick response to student requests and technical ability to resolve issues were identified as critical for maintaining the functionality and reliability of VLEs. This finding is supported by the work of Nowfeek and Rupasinghe (2022), who highlighted the importance of operational support during the COVID-19 pandemic to ensure the continuity of virtual learning (Nowfeek & Rupasinghe, 2022).

The need for cultural motivations for learning and proper culture building for effective use of virtual higher education capacities were highlighted. Lu (2016) supports this finding, emphasizing the importance of cultural inclusiveness in online learning to meet the diverse needs of students from various backgrounds (Lu, 2016). Increasing awareness of the value of virtual education and efforts to portray virtual learning outcomes positively were also noted, which aligns with the findings of Sims, Vidgen, and Powell (2008) on the

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digital divide and the need to address cultural and socio-economic elitism in higher education (Sims et al., 2008).

Incorrect attitudes towards virtual courses and fear of lack of attention to learner evaluation were identified as barriers. These findings are consistent with the work of Keller (2009), who highlighted the importance of user acceptance for the success of virtual learning environments (Keller, 2009). Creating attractive content, using graphics and multimedia, and providing flexible scheduling were deemed crucial for maintaining learner motivation, supporting the findings of Jain, Sharma, and Meher (2023) on the effects of online platforms on learner satisfaction through instructor presence and student engagement (Jain et al., 2023).

Despite the valuable insights gained from this study, several limitations must be acknowledged. Firstly, the sample size was relatively small, with only 12 participants, which may limit the generalizability of the findings. Secondly, the study relied solely on qualitative data collected through semi-structured interviews. While this method provides in-depth insights, it may also introduce biases related to the participants' perspectives and experiences. Additionally, the study focused on higher education institutions, which may not fully capture the diversity of virtual learning experiences across different educational levels and contexts.

Future research should consider expanding the sample size and including participants from a broader range of educational levels and contexts to enhance the generalizability of the findings. Longitudinal studies could provide valuable insights into the long-term impacts of virtual learning environments on student outcomes and engagement. Moreover, quantitative approaches, such as surveys and experimental designs, could complement the qualitative findings and provide a more comprehensive understanding of the factors influencing the success of virtual learning environments. Investigating the role of emerging technologies, such as artificial intelligence and machine learning, in enhancing virtual learning experiences could also be a fruitful area for future research.

Based on the findings of this study, several practical recommendations can be made for higher education institutions looking to enhance their virtual learning environments. Firstly, institutions should invest in robust software and hardware infrastructure to ensure that all students have access to the necessary digital resources and tools. Secondly, fostering effective interactions between teachers and students through well-designed VLEs and social network site-hosted forums is crucial for building a sense of community and collaboration. Institutions should also provide empowerment courses for both instructors and learners to equip them with the skills and knowledge needed for successful virtual learning.

Moreover, continuous assessment and enhancement of virtual learning programs are essential to maintain their quality and effectiveness. Institutions should establish clear prerequisites for e-learning, create unified systems for virtual education, and design user-friendly websites to facilitate the learning process. Providing prompt technical and operational support to address any issues that arise is also critical for ensuring the smooth functioning of virtual learning environments.

In terms of cultural inclusiveness, institutions should make concerted efforts to build a culture that supports virtual learning and addresses the diverse needs of students from various backgrounds. Raising awareness about the value of virtual education and portraying its outcomes positively can help change any incorrect attitudes towards virtual courses. Finally, creating engaging and attractive content, using multimedia and graphics, and offering flexible scheduling options can significantly enhance learner motivation and satisfaction.

In conclusion, the successful implementation of virtual learning environments in higher education requires a comprehensive approach that addresses both structural and behavioral factors. By investing in the necessary infrastructure, fostering effective interactions, providing empowerment courses, and building a supportive culture, institutions can create an engaging and inclusive virtual learning environment that meets the diverse needs of their students. The insights gained from this study can inform the development of strategies to enhance the quality and effectiveness of virtual learning, ultimately improving educational outcomes for all students.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Authors Contributions

All authors equally contributed.

Ethics principles

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In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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