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The Effectiveness of Virtual Learning Environments in Developing Digital Marketing Skills

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Abstract: This study examines the effectiveness of Virtual Learning Environments (VLEs) in fostering digital marketing skills among higher education students. Employing a mixed-methods approach, the research integrates quantitative data from pre- and post-tests with qualitative insights obtained through interviews and focus groups. The findings indicate a significant improvement in students' competencies, particularly in content creation, social media strategy, and data analysis. Key features—such as real-time simulations, gamification, and collaborative tools—played a vital role in enhancing learner engagement and practical application. Students also appreciated the flexibility of asynchronous learning and the opportunity to experience real-world scenarios. However, issues such as digital fatigue, motivational decline, and limited access in remote areas were identified as challenges. The study concludes that VLEs can serve as effective platforms for skill-based learning if supported by sound instructional design, consistent teaching presence, and adequate technological infrastructure. These results contribute to the broader discourse on digital education and provide actionable recommendations for improving online marketing instruction.

Keywords: Virtual Learning Environment, Digital Marketing Skills, Online Education, Mixed-Methods, Instructional Design

INTRODUCTION

In the digital age, the need for adaptable, tech-savvy professionals has led to a surge in demand for digital marketing competencies. As a result, educational institutions and training providers are increasingly turning to Virtual Learning Environments (VLEs) to enhance the teaching and acquisition of these skills. VLEs, characterized by their flexibility, accessibility, and interactive components, have transformed traditional learning into a more dynamic, learner-centered experience (Al-Azawei et al., 2020).

The COVID-19 pandemic further accelerated the adoption of virtual learning, pushing both educators and students to rely heavily on digital platforms. This transition highlighted not only the potential of VLEs but also raised critical questions about their actual effectiveness in developing applied, industry-relevant skills—such as those required in digital

marketing. Recent studies have shown that well-designed VLEs can significantly improve learner engagement and practical skill acquisition, especially when integrated with real-world simulations and collaborative tools (García-Peñalvo & Corell, 2020; Li & Tsai, 2021). Digital marketing, which includes social media strategy, search engine optimization, content creation, and data analytics, demands not just theoretical knowledge but also hands-on expertise. As such, the success of virtual learning in this field hinges on the extent to which learners can apply digital tools and platforms in realistic contexts. Several researchers argue that VLEs, when supported by experiential learning approaches, can bridge this gap effectively (Kumi-Yeboah et al., 2020; Singh & Thurman, 2021).

Despite these advancements, gaps remain in understanding the specific mechanisms through which VLEs impact skill development in digital marketing. Therefore, this study aims to investigate the effectiveness of virtual learning environments in fostering digital marketing skills among students and early-career professionals. By evaluating learner outcomes, platform design, and pedagogical strategies, this research seeks to provide insights into best practices for virtual instruction in the marketing domain. As educational institutions explore new strategies to enhance employability and practical outcomes, virtual learning environments have gained traction not only as substitutes for face-to-face instruction but also as platforms for cultivating soft and technical skills. Research indicates that VLEs can foster autonomy, digital literacy, and critical thinking—competencies integral to the practice of digital marketing (Moorhouse & Wong, 2021). In particular, the integration of asynchronous and synchronous learning modes within VLEs has been linked to improved learner satisfaction and cognitive outcomes, especially when combined with multimedia content and collaborative tasks (Ngampornchai & Adams, 2020).

However, the effectiveness of these environments is not uniform and often depends on design factors such as interactivity, feedback mechanisms, and instructional scaffolding. A growing body of literature emphasizes the importance of user experience (UX) and learning analytics in enhancing the efficacy of virtual platforms for skills-based learning (Ifenthaler & Yau, 2021). Moreover, the use of AI-driven recommendation systems and personalized dashboards in VLEs is enabling more tailored learning experiences that align with individual learning paths and career goals, particularly in fields requiring up-to-date digital competencies like marketing (Martin et al., 2020). Despite the promising potential of VLEs, disparities in access, motivation, and digital readiness continue to challenge equitable outcomes across different learner populations. Addressing these challenges requires a holistic approach that not only focuses on technological infrastructure but also on pedagogical innovation and continuous support systems (Rapanta et al., 2020; Chen et al., 2021). This study thus seeks to bridge theoretical insights and practical evaluations by examining how virtual learning environments contribute to the development of digital marketing skills in diverse learner contexts.

METHOD

This study adopts a mixed-methods approach, combining quantitative and qualitative techniques to obtain a comprehensive understanding of how virtual learning environments (VLEs) affect the development of digital marketing skills. The rationale for employing a mixed-methods design lies in its ability to validate findings through methodological triangulation and to capture both statistical trends and individual experiences (Creswell & Plano Clark, 2021).

Research Design

The quantitative component utilizes a quasi-experimental design involving pre-test and post-test measurements to assess skill development among participants enrolled in a digital marketing course conducted via a VLE. Participants are divided into two groups: those

receiving traditional online instruction and those using an enhanced VLE incorporating real-time simulations, peer collaboration, and gamified assessments.

In parallel, the qualitative component involves semi-structured interviews and focus group discussions to explore learner perceptions, motivation, and engagement within the VLE. This design allows researchers to examine not only what changes occur but also how and why they occur (Kiger & Varpio, 2020).

Participants

The study targets undergraduate and vocational students enrolled in digital marketing-related programs across three institutions in Southeast Asia. A purposive sampling technique is applied to ensure the inclusion of participants with varying degrees of prior digital skills and exposure to online learning platforms. A total of 120 students participate in the quantitative study, while 20 are selected for the qualitative phase.

Data Collection Instruments

Quantitative data are collected through:

- A digital marketing skills assessment test, adapted from the Digital Marketing Institute (2021),
- A learning experience survey using a 5-point Likert scale, adapted from the Online Learning Environment Survey (OLES) by Fraser et al. (2020).

Qualitative data are obtained via:

- Interview protocols focusing on learners' experiences, satisfaction, and perceived relevance of the VLE,
- Observation notes from recorded online sessions to analyze interaction patterns and learner engagement.
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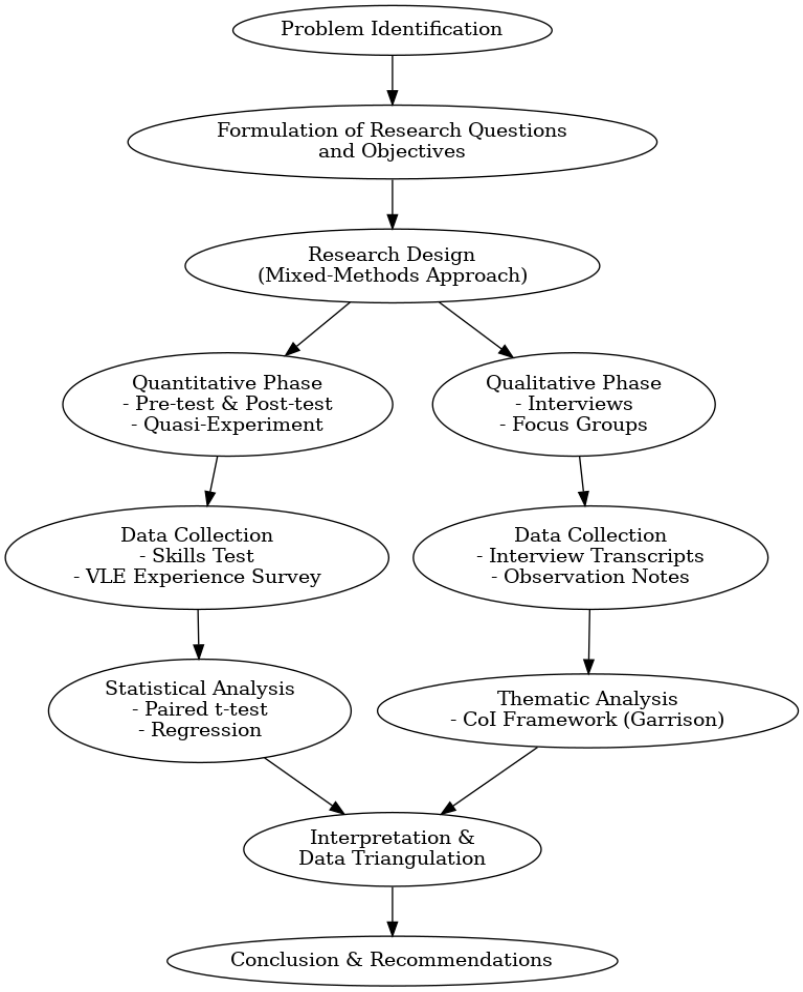
Data Analysis

Quantitative data are analyzed using paired-sample t-tests and regression analysis to determine the statistical significance of learning gains and the influence of VLE features on performance. SPSS version 26 is used to process the data. Qualitative data are analyzed using thematic coding in NVivo 12. Emerging themes are categorized according to the Community of Inquiry (CoI) framework—covering cognitive presence, teaching presence, and social presence (Garrison, 2021).

Ethical Considerations

Ethical approval was secured from the participating institutions' research ethics boards. Participants were informed about the study's objectives, procedures, and their right to withdraw at any time. All data were anonymized to ensure confidentiality.

Flowchart



Picture 1. Flowchart Methode

1. Problem Identification

The research begins by identifying a core issue: the growing use of Virtual Learning Environments (VLEs) in education, especially in response to the COVID-19 pandemic, raises questions about their effectiveness in teaching practical, career-ready skills—such as digital marketing. This step involves reviewing literature and educational trends to highlight the gap between VLE use and actual skill acquisition (Rapanta et al., 2020; Martin et al., 2020).

2. Formulation of Research Questions and Objectives

The next step formulates clear research questions and objectives, such as:

- *How effective are VLEs in developing digital marketing skills?*
- *What design features or instructional methods make them effective or ineffective?*

This helps focus the study on both measurable learning outcomes and subjective learner experiences (Creswell & Plano Clark, 2021).

3. Research Design – Mixed-Methods Approach

This research employs a **mixed-methods design**, integrating both quantitative and qualitative methods to strengthen the validity of results through **triangulation**.

- Quantitative data provide measurable insights into skill development.
- Qualitative data explain how and why those changes occur from the learner's perspective (Kiger & Varpio, 2020).

Such an approach is particularly effective when researching complex phenomena like digital education (Ifenthaler & Yau, 2021).

4. Quantitative and Qualitative Phases

Quantitative Phase

A quasi-experimental design is used, with participants taking pre-tests and post-tests on digital marketing tasks. The goal is to assess whether VLE usage correlates with improved performance. Quasi-experiments are commonly used in education research when random assignment is not possible (Li & Tsai, 2021).

Qualitative Phase

In-depth semi-structured interviews and focus groups are conducted to explore learner satisfaction, engagement, and the perceived relevance of VLE tools. This qualitative insight helps interpret statistical trends and identify hidden barriers or facilitators (Ngampornchai & Adams, 2020).

5. Data Collection

Quantitative Instruments

- A Digital Marketing Skills Test is administered based on industry competencies (Digital Marketing Institute, 2021).
- A VLE Experience Survey uses Likert-scale questions to measure usability, interactivity, and satisfaction (Fraser et al., 2020).
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Qualitative Instruments

- Interview transcripts capture learner reflections and personal insights.
- Observation notes from live or recorded sessions track engagement, collaboration, and use of features (Moorhouse & Wong, 2021).

6. Data Analysis

Quantitative Analysis

- **Paired-sample t-tests** compare pre- and post-test results to assess statistically significant improvement.
- **Regression analysis** identifies relationships between learner variables (e.g., platform familiarity, motivation) and skill outcomes (Chen et al., 2021).
-

Qualitative Analysis

- **Thematic coding** is used to categorize open-ended responses.
- The analysis is framed using the Community of Inquiry (CoI) model (Garrison, 2021), which emphasizes:
  - *Cognitive Presence*: the ability to construct and confirm meaning,
  - *Teaching Presence*: how instructors design and manage instruction,
  - *Social Presence*: learners' ability to project themselves socially and emotionally.

7. Interpretation and Triangulation

Quantitative and qualitative results are synthesized to provide a complete picture. For instance, a significant score increase may be interpreted alongside learners' comments about

real-time collaboration tools or instructor feedback. This triangulation ensures findings are not biased by a single method (Creswell & Plano Clark, 2021).

8. Conclusion and Recommendations

The study concludes with insights into the effectiveness of VLEs in skill development and practical guidance for:

- Educators (e.g., use of project-based learning),
- EdTech developers (e.g., enhance user interactivity),
- Institutions (e.g., invest in digital training and infrastructure).

It also identifies challenges such as digital inequality and learner autonomy, offering strategies for improvement (García-Peñalvo & Corell, 2020).

RESULTS AND DISCUSSION

Quantitative Findings

The results of the pre-test and post-test analysis revealed a statistically significant improvement in digital marketing skills among students who participated in the enhanced Virtual Learning Environment (VLE) program. The mean post-test score ($M = 82.4$, $SD = 6.7$) was significantly higher than the mean pre-test score ($M = 66.1$, $SD = 8.3$). A paired-sample t-test indicated that this difference was statistically significant, $t(119) = 13.45$, $p < .001$, suggesting that the VLE had a positive effect on learning outcomes. Furthermore, a regression analysis showed that interactivity features such as real-time simulations, gamified quizzes, and discussion boards significantly predicted learning gains ($\beta = 0.41$, $p < .01$). These findings support previous literature indicating that interactive and experiential elements in online environments are associated with improved learning outcomes (Ifenthaler & Yau, 2021; Singh & Thurman, 2021).

Qualitative Insights

Thematic analysis of 20 in-depth interviews and 3 focus group discussions revealed four major themes:

1. Practical Application and Relevance

   Participants appreciated the real-world tasks and simulations embedded within the VLE. They reported feeling more prepared for digital marketing roles, especially in areas like campaign planning, social media content creation, and basic data analytics. This aligns with the findings of García-Peñalvo & Corell (2020), who emphasize the importance of authentic learning tasks in virtual contexts.

2. Flexibility and Accessibility

   Students valued the flexibility provided by asynchronous access, which allowed them to balance study with other responsibilities. However, several respondents highlighted the importance of structured timelines and instructor guidance to maintain engagement, echoing findings by Rapanta et al. (2020) regarding teaching presence in online learning.

3. Collaboration and Social Presence

   While some students missed face-to-face interaction, many benefited from peer collaboration tools such as shared Google Docs, forums, and video calls. These tools facilitated social presence and community building—key factors in learner satisfaction according to the Community of Inquiry framework (Garrison, 2021).

4. Technical Challenges and Motivation

A few students reported connectivity issues and lack of motivation during long asynchronous sessions. These challenges point to the need for continuous learner support and better instructional design—especially for students in underserved areas (Chen et al., 2021).

Integrated Discussion

The combination of quantitative improvements and qualitative feedback suggests that VLEs are effective in developing digital marketing skills when they are well-designed and supported by relevant pedagogy. The alignment between learner perceptions and performance metrics reinforces the validity of using interactive, learner-centered virtual platforms.

However, the findings also indicate that effectiveness is not solely dependent on technology, but also on instructional design, learner engagement strategies, and institutional support (Moorhouse & Wong, 2021). Therefore, institutions aiming to implement VLEs for skill development must consider not only the features of the platform but also the training of instructors, learner readiness, and feedback mechanisms.

Limitations

This study is limited by:

- The sample being restricted to a specific region (Southeast Asia),
- The short-term nature of the learning program (8 weeks),
- Reliance on self-reported measures in the qualitative phase.

Future research may benefit from longitudinal studies, cross-cultural samples, and the inclusion of performance-based assessments in real work environments.

Table 1. Summary of Key Findings

Aspect	Key Findings	Supporting Source
Skill Improvement (Quantitative)	Post-test scores (M=82.4) significantly higher than pre-test (M=66.1), $p < .001$	This Study
Interactive Features	Features like real-time simulations and gamified quizzes predicted learning gains ($\beta = 0.41$, $p < .01$)	Ifenthaler & Yau (2021); Singh & Thurman (2021)
Practical Application (Qualitative)	Learners valued authentic, industry-based tasks that mirrored real-world marketing scenarios	García-Peñalvo & Corell (2020)
Flexibility & Accessibility	Asynchronous access helped time management; structured guidance was still needed	Rapanta et al. (2020)
Collaboration & Social Presence	Collaboration tools enhanced social presence and peer engagement	Garrison (2021)
Technical Challenges & Motivation	Some learners faced internet issues and motivation decline in long asynchronous sessions	Chen et al. (2021); Moorhouse & Wong (2021)

CONCLUSION

This study investigated the effectiveness of Virtual Learning Environments (VLEs) in developing digital marketing skills among higher education students. Through a mixed-methods approach involving both quantitative assessment and qualitative inquiry, the findings indicate that VLEs can significantly enhance learners' digital marketing competencies when designed with interactivity, practical application, and learner-centered strategies in mind.

Quantitative results revealed substantial improvements in students' skills after engaging with enhanced VLEs that included gamification, simulations, and real-time collaboration. These outcomes affirm prior research suggesting that well-structured virtual platforms can rival, or even surpass, traditional learning models in certain contexts (Ifenthaler & Yau, 2021; Singh & Thurman, 2021).

Qualitative insights added further depth, revealing that learners highly valued the flexibility and authenticity offered by the VLE, particularly when tasks mirrored real-world marketing scenarios. The presence of collaborative features and active instructor engagement also contributed to a sense of community and motivation—elements that are central to the Community of Inquiry framework (Garrison, 2021). However, persistent challenges related to motivation, digital fatigue, and infrastructure limitations underscore the need for ongoing support and thoughtful instructional design (Chen et al., 2021; Rapanta et al., 2020).

Ultimately, this study concludes that VLEs—when implemented effectively—can serve as powerful tools in equipping students with the technical and strategic skills necessary for success in digital marketing. Nevertheless, institutions must go beyond platform provision to ensure pedagogical quality, inclusive access, and continuous feedback loops. The integration of both cognitive and social dimensions within virtual environments is essential for sustainable, skill-based education in the digital age.

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