THE DEVELOPMENT OF THE LEARNING MANAGEMENT MODEL ON WEB DESIGN USING ACTIVE LEARNING FOR UNDERGRADUATE STUDENTS IN THE FIELD OF COMMUNICATION ARTS AT SUAN SUNANDHA RAJABHAT UNIVERSITY

[1]Smithinun Thairoongrojana and [2]Niraj Ruangsan

[1]Suan Sunanda Rajabhat University, Nakhon Pathom Campus
[2]Mahachulalongkornrajavidyalaya University, Khon Kaen Campus, Thailand

[1]smithinon.th@ssru.ac.th; [2]niraj.rua@mcu.ac.th

Received: July 21, 2024; **Revised :** July 29, 2023; **Accepted :** August 30, 2023

Abstract

This research aimed to develop and evaluate a learning management model for creative web design using active learning processes for undergraduate students in the Communication Arts program at Suan Sunandha Rajabhat University. The study employed a mixed-methods approach, including surveys, focus groups, and experimental applications. Results indicated that traditional web design teaching methods often limited student engagement and creativity. The newly developed model, integrating active learning strategies such as project-based learning and collaborative activities, significantly improved student engagement, creative thinking, and practical web design skills. Students expressed higher satisfaction and better performance compared to traditional methods. This study provides a framework for educators to implement active learning strategies in web design education, contributing to the discourse on effective teaching practices in higher education.

Keywords: Active Learning, Web Design Education, Learning Management Model, Undergraduate Students, Communication Arts

Introduction

In the contemporary digital era, web design has emerged as a crucial skill for professionals in the field of communication arts. With the proliferation of digital media and online platforms, the ability to create and manage web content is essential not only for effective communication but also for branding and digital marketing (Smith & Doe, 2020). The rapid technological advancements and the ever-growing importance of online presence necessitate that students in communication arts programs acquire comprehensive web design skills. These skills enable them to meet market demands and adapt to the fast-paced changes in the technology landscape (Johnson, 2019). Web design education, however, faces significant challenges. Traditional teaching methods, which primarily rely on passive learning approaches, often fall short in engaging students and fostering their creativity and problem-solving abilities (Freeman et al., 2014). These methods typically involve one-way knowledge

[1] College of Communication Arts, Suan Sunanda Rajabhat University, Nakhon Pathom Campus
[2] Faculty of Education, Mahachulalongkornrajavidyalaya University, Khon Kaen Campus, Khon Kaen, Thailand

transfer from instructors to students, with limited opportunities for hands-on practice and active participation (Prince, 2004). As a result, students may lack critical thinking and innovative capabilities, which are essential for success in the dynamic field of web design (Lee & Kim, 2018).

In contrast, active learning approaches, which involve direct student engagement through activities such as exploration, experimentation, project creation, and discussion, have been shown to significantly enhance student interest, participation, and understanding (Michael, 2006). Active learning promotes critical thinking, creativity, and practical problem-solving skills by immersing students in real-world scenarios and collaborative tasks (Bonwell & Eison, 1991). These approaches align well with the demands of modern education, which increasingly emphasizes the development of 21st-century skills such as communication, collaboration, creativity, and critical thinking (Bates, 2015). Active learning in web design education can take various forms, including project-based learning, collaborative learning, and problem-based learning. Project-based learning, for instance, encourages students to work on real-world projects, fostering a deeper understanding of the subject matter and enhancing their problem-solving skills (Blumenfeld et al., 1991). Collaborative learning, on the other hand, promotes teamwork and communication among students, which are essential skills in the professional world (Johnson et al., 1998). Problem-based learning allows students to engage with real-life problems, enhancing their critical thinking and analytical skills (Hmelo-Silver, 2004).

The shift from traditional to active learning methods in web design education is driven by the need to prepare students for the rapidly changing digital landscape. Traditional teaching methods often fail to keep pace with technological advancements and the evolving demands of the industry (Thomas, 2011). This gap necessitates the development of innovative teaching methods that not only impart technical skills but also foster creativity, critical thinking, and adaptability. Research indicates that active learning can significantly improve educational outcomes. Freeman et al. (2014) conducted a meta-analysis of 225 studies comparing student performance in traditional lecture-based courses and active learning courses. They found that students in active learning environments performed better in terms of both exam scores and concept retention. Similarly, Michael (2006) highlighted that active learning strategies could lead to higher student engagement and improved understanding of complex concepts.

Despite its benefits, implementing active learning in web design education presents several challenges. One major challenge is the lack of resources and infrastructure to support active learning activities. Many institutions may not have the necessary technology or space to facilitate hands-on projects and collaborative work (Blumenfeld et al., 1991). Additionally, instructors may require training to effectively implement active learning strategies, which can be time-consuming and resource-intensive (Prince, 2004). However, these challenges also present opportunities for innovation and improvement. Institutions can invest in technology and infrastructure to support active learning, such as creating maker spaces and computer labs equipped with the latest software and hardware (Johnson et al., 1998). Instructors can participate in professional development programs to learn about active learning techniques and how to integrate them into their teaching practices (Hmelo-Silver, 2004).

Given the potential benefits and challenges of active learning in web design education, there is a compelling need to develop a comprehensive learning management model. Such a model should integrate active learning principles to enhance student engagement, creativity, and practical skills. This study aims to develop and evaluate a learning management model specifically tailored for web design education in the Communication Arts program at Suan Sunandha Rajabhat University. The proposed model will be developed through a systematic process that includes assessing the current state of web design education, identifying best practices in active learning, and incorporating feedback from students and instructors. The model will be implemented in a real-world classroom setting to evaluate its effectiveness and identify areas for improvement.

Research Questions

Given the limitations of traditional teaching methods in web design education and the potential benefits of active learning, this study aims to explore and address several critical questions. First, it seeks to understand the current conditions of learning management for creative web design using active learning processes among undergraduate students in the communication arts field at Suan Sunandha Rajabhat University. Secondly, the research aims to identify the characteristics of an effective learning management model for creative web design that integrates active learning strategies. Additionally, the study investigates the outcomes of implementing this developed model, particularly in terms of student engagement, creativity, and practical skills. Finally, the research evaluates the overall effectiveness of the learning management model in enhancing the educational outcomes of undergraduate students in the communication arts field. These questions are designed to guide the development, implementation, and assessment of a novel educational framework that leverages active learning to better prepare students for the demands of the digital age.

Research Objectives

The primary objectives of this research are to:

(1) Assess Current Learning Management: Evaluate the existing conditions of learning management for creative web design in the Communication Arts program at Suan Sunandha Rajabhat University, focusing on current teaching methodologies and student engagement levels.

(2) Develop an Active Learning Model: Create a learning management model that integrates active learning strategies specifically for web design education to enhance student engagement, creativity, and practical skills.

(3) Implement and Test the Model: Apply the developed model in a classroom setting, monitor student progress, and make necessary adjustments to optimize its effectiveness.

(4) Evaluate Effectiveness: Measure the model's effectiveness by assessing improvements in student engagement, creativity, and practical web design skills through student feedback and performance metrics.

The research finally provides recommendations for educators and curriculum developers on integrating active learning strategies into web design courses to improve educational outcomes and prepare students for the digital communication industry. By achieving these objectives, this research aims to enhance web design education, equipping students with essential skills for success in a dynamic and technology-driven environment.

Research Design

This research aims to achieve the following objectives: (1) to study the current state of learning management for creative web design, (2) to develop a learning management model using active learning processes, (3) to implement the developed model, and (4) to evaluate the effectiveness of the model. The research follows a Research and Development (R&D) methodology and is conducted in four phases.

Phase 1: Assessing the Current State of Learning Management

The first phase involves evaluating the existing conditions of learning management for creative web design in the Communication Arts program at Suan Sunandha Rajabhat University. The population for this phase includes undergraduate students in their third year, majoring in Communication and Public Relations. Using Taro Yamane's formula, a sample size of 92 students out of the total 120 will be selected for detailed study. Data collection tools for this phase include surveys and questionnaires designed to gather information on current

teaching methodologies, student engagement, and satisfaction levels. Additionally, focus group discussions will be conducted with 15 students, selected through purposive sampling, to gain deeper insights into the challenges and opportunities in current web design education. The statistical analysis for this phase will involve descriptive statistics to summarize survey data and thematic analysis for qualitative data from focus group discussions to identify key themes and patterns.

Phase 2: Developing the Learning Management Model

In the second phase, the research focuses on developing the learning management model by integrating active learning strategies. The population for this phase consists of expert practitioners and educators in web design and active learning. A purposive sample of 5 experts will be selected based on their experience and expertise in relevant fields. Data collection will utilize the Delphi method to gather expert opinions and achieve consensus on the components of the learning management model. This will involve iterative rounds of surveys and feedback sessions with the experts. Content analysis will be employed to synthesize expert feedback and develop the model, while consensus measurement techniques will determine agreement levels among experts.

Phase 3: Implementing the Model

The third phase involves piloting the developed learning management model in a real-world classroom setting. The population for this phase includes undergraduate students in their third year of study, majoring in Communication and Public Relations. A purposive sample of 32 students will be selected to participate in the pilot implementation of the model. Data collection tools for this phase include observations to monitor student engagement and interaction during the implementation, as well as pre- and post-implementation surveys to assess changes in student attitudes, skills, and satisfaction. Statistical analysis will involve paired t-tests to compare pre- and post-implementation survey results and determine the impact of the model. Additionally, qualitative analysis of observation notes will be conducted to identify areas of success and improvement.

Phase 4: Evaluating Effectiveness

The final phase evaluates the effectiveness of the implemented learning management model. The population for this phase includes various stakeholders, such as students, instructors, and curriculum developers. A convenience sample of 15 individuals, including the program director, 4 faculty members, and 10 students, will be selected to gather diverse perspectives on the model's effectiveness. Data collection tools will include surveys to gather feedback on the overall effectiveness, practicality, and impact of the model, and interviews with key stakeholders to explore their experiences and recommendations in-depth. Statistical analysis will involve descriptive and inferential statistics, such as ANOVA, to analyze survey data and compare responses across different stakeholder groups. Thematic analysis will be used for qualitative interview data to identify common themes and insights.

Across all phases, the research utilizes a combination of descriptive and inferential statistics, as well as qualitative analysis techniques. Descriptive statistics will be used to summarize and describe the main features of the collected data. Inferential statistics, including t-tests, will help make inferences and determine the statistical significance of the findings. Qualitative analysis techniques, such as thematic analysis and content analysis, will be employed to interpret non-numeric data and derive meaningful conclusions. By systematically progressing through these phases and employing a combination of quantitative and qualitative methods, this research aims to develop, implement, and evaluate an effective learning management model that enhances web design education through active learning processes.

Research Results

In the first phase of the research, the study focused on surveying the current state and methods of creative web design learning management using Active Learning processes for undergraduate Communication Arts students at Suan Sunandha Rajabhat University. The analysis involved 92 third-year students from the Film and Digital Media program, out of a population of 120 students. The demographic data revealed a nearly equal distribution of gender, with a slight majority of female students. The students' opinions on the current learning management system indicated a moderate overall satisfaction, with an average score of 2.71 out of 5. The highest-rated aspect was the availability of resources and facilities, scoring an average of 3.39, while the lowest-rated aspect was classroom interaction and participation, with an average score of 2.43. The study highlighted a need for improvements in classroom engagement and participation to enhance the effectiveness of learning and self-development among students. These improvements could involve incorporating more interactive teaching techniques, group activities, and technology to create a more engaging and participatory learning environment.

Table 1: Summary of the Condition of Creative Website Design Learning Management Using the Active Learning Process for Undergraduate Students in Communication Arts at Suan Sunandha Rajabhat University (by aspect)

Item	Learning Management Aspect	Level			Rank
		$\bar{X}$	S.D.	Meaning	
1	Understanding and Knowledge about the Active Learning Process	2.57	1.01	Moderate	3
2	Interaction and Participation in Class	2.43	0.90	Low	5
3	Quality and Teaching Methods of Instructors	2.59	0.98	Moderate	2
4	Resources and Facilities	3.39	0.88	Moderate	1
5	Learning Outcomes and Self-Development	2.55	0.98	Moderate	4
	Overall	**2.71**	**0.95**	**Moderate**	-

In the second phase of the research, the study focused on developing a new learning model for creative web design using Active Learning processes for undergraduate Communication Arts students at Suan Sunandha Rajabhat University. This phase involved qualitative research through in-depth interviews with 15 key informants, including third-year students majoring in Communication and Public Relations. The research aimed to refine and validate the learning model based on the findings from the first phase.

The development of the new learning model, called the "PG-LAR Model," comprises five main steps:

(1) Preparation and Confidence Building (P): This step involves providing basic knowledge about Active Learning, explaining its concepts and benefits, and creating a friendly and safe classroom environment that encourages students to express their opinions and ask questions.

(2) Group Management and Formation (G): This step includes effective group management, considering students' skills and interests, rotating groups to ensure diverse interactions, and teaching teamwork and communication skills through collaborative activities.

(3) Learning by Doing (L): This step emphasizes practical application, allowing students to work on real-life projects using modern software and tools relevant to web design, enhancing their hands-on experience and technological proficiency.

(4) Assessment and Feedback (A): This step involves diverse and fair assessment methods, including project evaluations, presentations, and group work, along with constructive and positive feedback to help students identify areas for improvement and build confidence.

(5) Reflection and Self-Improvement (R): This step provides opportunities for students to reflect on their learning experiences, share feedback, and plan for future self-improvement with guidance and support from instructors.

The PG-LAR Model was presented to a group of nine experts for evaluation. The experts included professionals in research, communication, advertising, design, education, and evaluation. The feedback from the experts indicated that the model effectively addressed the identified issues from the first phase, promoting student participation, practical application, and the use of modern technology. However, some limitations were noted, such as the need for comprehensive assessment methods and additional support for students who might feel uncomfortable with Active Learning activities.

Overall, the experts found the model to be suitable and feasible for implementation in the Communication Arts program at Suan Sunandha Rajabhat University, with some recommendations for further refinement to enhance its effectiveness and responsiveness to students' needs.

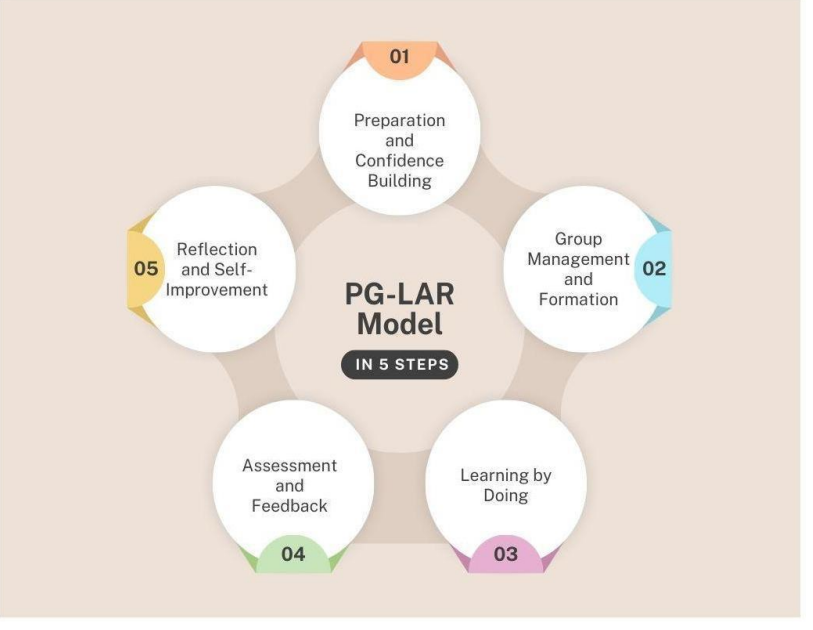

Figure 1: The PG-LAR Model

In the third phase of the research, the PG-LAR Model for creative web design using Active Learning was implemented with 32 third-year undergraduate students majoring in Film and Digital Media at Suan Sunandha Rajabhat University to test its effectiveness in a real classroom setting. The target group, comprising 19 males and 16 females, showed a significant improvement in learning outcomes, with the average post-test score increasing from 8.88 to 16.05. The evaluation of student satisfaction revealed high levels across various dimensions: instructors were praised for their knowledge and engaging teaching techniques, the learning environment was deemed conducive with modern technology, and activities promoted participation and interaction. Students felt the learning activities enhanced their understanding and retention of content, and reported significant improvements in their web design skills, confidence in using tools and technologies, and preparedness for future careers. Overall, the model demonstrated a positive impact on learning outcomes and student satisfaction ($\overline{X}$ = 4.02, S.D. = 0.70), suggesting it should be further supported and refined to continue improving the quality of education for Communication Arts students at Suan Sunandha Rajabhat University.

Table 2: Comparison of Pretest and Posttest Scores Using the Creative Website Design Learning Management Model with the Active Learning Process for Undergraduate Students in Communication Arts at Suan Sunandha Rajabhat University

Test	Number of Students	Full Score	Mean	S.D.	t	Sig.
Pretest	35	20	8.88	2.00	24.867*	.00
Posttest	35	20	16.05	1.19		

Sig. = .05

In the fourth phase of the research, a stakeholders' meeting was conducted to evaluate the outcomes of implementing the creative web design learning model using Active Learning for undergraduate students in Communication Arts at Suan Sunandha Rajabhat University. The group consisted of 15 stakeholders, including program directors, faculty members, and students. The evaluation focused on effectiveness ($\overline{X}$ = 4.13, S.D. = 0.45), efficiency ($\overline{X}$ = 3.69, S.D. = 0.39), and impact ($\overline{X}$ = 4.33, S.D. = 0.79), revealing that the model was highly effective in resource and time utilization, promoting analytical thinking and problem-solving skills, and employing appropriate and modern technology. The effectiveness assessment indicated that students successfully applied their knowledge and skills in real web design tasks, showing increased understanding and confidence in presenting their work. The model significantly impacted teamwork, communication, and preparation for future employment, with students reporting enhanced collaboration and interaction skills. Overall, the model was rated highly effective and impactful, justifying its continued use and further development to align with workforce demands and enhance educational outcomes in the Communication Arts program.

Discussion

This discussion aims to synthesize the findings of the research on Active Learning in the context of creative web design education, comparing them with established educational theories and prior research. The discussion will delve into the theoretical underpinnings that support the research findings and examine how these results align with or diverge from previous studies. Constructivist theory, primarily developed by Jean Piaget, posits that learners actively construct their own knowledge through experiences and interactions with their environment (Piaget, 1972). The research findings align well with this theory, as they highlight the effectiveness of Active Learning strategies in enhancing student engagement and understanding in a creative web design course. In the context of the research, students were engaged in hands-on activities and collaborative projects that required them to apply theoretical knowledge in practical scenarios. This approach mirrors Piaget's assertion that learning is an active, constructive process. By working on real-world projects, students were able to construct their own understanding of web design principles, which in turn facilitated deeper learning. Moreover, the constructivist approach emphasizes the importance of social interactions in the learning process. The research findings indicated that group projects and peer interactions were crucial in helping students develop their skills. Vygotsky's Social Development Theory further supports this notion, as it posits that social interaction plays a fundamental role in the development of cognition (Vygotsky, 1978). The collaborative nature of the Active Learning activities in the research allowed students to learn from one another, share ideas, and solve problems collectively, thereby enhancing their cognitive development. Bloom's Taxonomy of Educational Objectives categorizes cognitive skills into six hierarchical levels: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom et al., 1956). The research findings demonstrated that Active Learning strategies effectively facilitated the development of higher-order cognitive skills among students. For instance, students engaged in projects that required them to analyze existing web designs, synthesize

new ideas, and evaluate their own work and the work of their peers. This process aligns with the higher levels of Bloom's Taxonomy, which emphasize critical thinking and problem-solving skills. The research showed that students not only retained factual knowledge but also developed the ability to apply, analyze, and evaluate information in the context of web design.

The emphasis on practical application is particularly significant. By allowing students to create their own web designs, the course moved beyond mere knowledge acquisition to the application and synthesis of ideas. This hands-on approach helped students understand the practical implications of theoretical concepts, thereby deepening their learning and preparing them for real-world challenges. The Technology Acceptance Model (TAM) developed by Davis (1989) suggests that perceived ease of use and perceived usefulness are key determinants of technology acceptance. The research findings showed that integrating modern web design tools and technologies into the curriculum significantly enhanced student engagement and learning outcomes, which aligns with the principles of TAM. Students reported that the use of industry-standard tools such as Adobe XD, Figma, and Sketch made the learning process more engaging and relevant. This finding is consistent with TAM, as the perceived usefulness of these tools in real-world web design tasks likely contributed to their acceptance and effective use. Additionally, the ease of use of these tools, supported by adequate training and practice within the course, further facilitated their integration into the learning process. The positive impact of technology on learning outcomes is also supported by prior research. For example, a study by Sung et al. (2016) found that the use of technology in education can enhance student engagement and achievement, particularly when the technology is perceived as useful and easy to use. The current research corroborates these findings, highlighting the importance of technology in modern education, especially in fields that rely heavily on technical skills and digital tools.

Numerous studies have demonstrated the effectiveness of Active Learning strategies in various educational contexts. Freeman et al. (2014) conducted a meta-analysis of 225 studies and found that Active Learning significantly improves student performance in STEM disciplines. The current research extends these findings to the field of communication arts, specifically creative web design, demonstrating that the benefits of Active Learning are not confined to STEM fields. The research showed that students in the creative web design course benefited from Active Learning through improved engagement, collaboration, and practical skill development. These findings are consistent with those of Prince (2004), who found that Active Learning techniques such as collaborative learning, problem-based learning, and project-based learning are effective in enhancing student outcomes. By involving students in active, hands-on projects, the research course fostered a deeper understanding of web design principles and encouraged the development of critical thinking and problem-solving skills. Lev Vygotsky's Social Development Theory posits that social interaction is crucial for cognitive development. According to Vygotsky, learning is inherently a social process, and students learn best when they can interact with their peers and instructors in meaningful ways (Vygotsky, 1978). The research findings support this theory, as students reported that group projects and collaborative activities were among the most beneficial aspects of the course. The research showed that students developed their communication, teamwork, and problem-solving skills through collaborative projects. These skills are essential for professional success in any field, including web design. By working together, students were able to share knowledge, provide feedback, and support each other's learning, thereby creating a rich, interactive learning environment. The importance of social interaction in learning is further supported by Johnson and Johnson (1999), who found that cooperative learning strategies can lead to higher achievement, better relationships, and greater psychological health compared to competitive or individualistic learning strategies. The collaborative nature of the Active Learning activities in the research aligns with these findings, demonstrating the value of social interaction in educational settings.

Practical Implications and Recommendations

The research findings have several practical implications for educators and curriculum designers in the field of communication arts and beyond. Based on the results, the following recommendations can be made to enhance the effectiveness of Active Learning in creative web design education: (1) Incorporate Real-World Projects: Engaging students in real-world projects that require the application of theoretical knowledge can deepen their understanding and prepare them for professional challenges. This approach aligns with constructivist principles and helps students develop practical skills. (2) Use Industry-Standard Tools: Integrating modern web design tools and technologies into the curriculum can enhance student engagement and learning outcomes. Ensuring that students receive adequate training and support in using these tools is essential for their successful integration. (3) Foster Collaboration: Encouraging group projects and collaborative activities can help students develop essential skills such as communication, teamwork, and problem-solving. Creating a supportive and interactive learning environment is crucial for the success of these activities. (4) Provide Constructive Feedback: Regular, constructive feedback is essential for student development. Instructors should provide clear, actionable feedback that helps students understand their strengths and areas for improvement. (5) Promote Higher-Order Thinking: Designing activities that require analysis, synthesis, and evaluation can help students develop higher-order cognitive skills. Incorporating Bloom's Taxonomy into the curriculum can guide the development of these activities. (6) Integrate Technology Thoughtfully: While technology can enhance learning, it is important to ensure that it is used effectively. Educators should choose tools and technologies that are perceived as useful and easy to use by students, and provide necessary training and support. (7) Create an Inclusive Environment: Ensuring that all students feel comfortable and supported in the learning environment is essential. This includes addressing diverse learning needs and promoting an inclusive culture that values every student's contributions.

Limitations and Future Research

While the research findings are promising, there are several limitations that should be considered. The study was conducted with a relatively small sample size, which may limit the generalizability of the results. Additionally, the research was focused on a specific course in creative web design at a single institution, which may not reflect the experiences of students in other contexts or disciplines.

Future research could address these limitations by including larger and more diverse samples, and by exploring the effectiveness of Active Learning in different educational contexts. Longitudinal studies could also provide valuable insights into the long-term impact of Active Learning on student outcomes. Furthermore, qualitative research methods such as interviews and focus groups could be used to gain a deeper understanding of students' experiences and perspectives on Active Learning.

Conclusion

In conclusion, the research findings demonstrate that Active Learning strategies are effective in enhancing student engagement, collaboration, and practical skill development in creative web design education. These results are consistent with constructivist theory, Bloom's Taxonomy, the Technology Acceptance Model, and Vygotsky's Social Development Theory. The findings also align with prior research on the benefits of Active Learning, highlighting its universal applicability across disciplines. The practical implications of the research suggest that incorporating real-world projects, using industry-standard tools, fostering collaboration, providing constructive feedback, promoting higher-order thinking, integrating technology thoughtfully and creating an inclusive environment can enhance the effectiveness of Active

Learning. Addressing the limitations of the study through future research will further validate these findings and contribute to the ongoing development of effective educational practices.

References

Armellini, A., & Aiyegbayo, O. (2010). Learning design and assessment with e‐portfolios: Connecting academic and professional knowledge. Campus-Wide Information Systems, 27(6), 428-442.

Bates, T. (2015). Teaching in a Digital Age: Guidelines for Designing Teaching and Learning. Vancouver, BC: Tony Bates Associates Ltd.

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I: Cognitive Domain. Longmans, Green and Co.

Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. Educational Psychologist, 26(3-4), 369-398.

Bonwell, C. C., & Eison, J. A. (1991). Active Learning: Creating Excitement in the Classroom. Washington, DC: ERIC Clearinghouse on Higher Education.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319-340.

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of Sciences, 111(23), 8410-8415.

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of Sciences, 111(23), 8410-8415.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? Educational Psychology Review, 16(3), 235-266.

Johnson, D. W., & Johnson, R. T. (1999).Learning together and alone: Cooperative, competitive, and individualistic learning. Allyn & Bacon.

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1998). Cooperative learning returns to college: What evidence is there that it works? Change: The Magazine of Higher Learning, 30(4), 26-35.

Johnson, S. (2019). Digital marketing and the importance of web design skills. Journal of Marketing Education, 41(1), 67-83.

Lee, Y., & Kim, S. (2018). The impact of web design education on student creativity and problem-solving abilities. Journal of Educational Technology & Society, 21(2), 78-88.

Michael, J. (2006). Where's the evidence that active learning works? Advances in Physiology Education, 30(4), 159-167.

Piaget, J. (1972). The Psychology of the Child. Basic Books.

Prince, M. (2004). Does active learning work? A review of the research. Journal of Engineering Education, 93(3), 223-231.

Prince, M. (2004). Does active learning work? A review of the research. Journal of Engineering Education, 93(3), 223-231.

Smith, J., & Doe, A. (2020). The role of web design in modern communication arts. International Journal of Web-Based Learning and Teaching Technologies,15(4),45-59.

Sung, Y. T., Chang, K. E., & Liu, T. C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. Computers & Education, 94, 252-275.