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PBL education plan for video content production class based on generative AI technology

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Abstract: With the rapid advancement of digital technology, Generative AI has emerged as a transformative force in commercial advertising production, fundamentally reshaping traditional production methods. It enhances both productivity and creativity throughout the entire advertising process by supporting various stages such as scenario writing, image and video generation, and voice and music creation. Moreover, data-driven personalized message generation enables advertisers to deliver tailored experiences to consumers, thereby maximizing the effectiveness of advertising campaigns. This study analyzes the integration of Generative AI technology into commercial advertising production and proposes strategic approaches through the application of the Problem-Based Learning (PBL) methodology. By adopting this approach, advertisers can effectively address real-world challenges in their creative processes. The convergence of Generative AI and PBL methodology empowers advertisers to execute innovative ideas more efficiently and effectively, providing a critical tool for maintaining and enhancing competitiveness in a rapidly evolving digital landscape. The primary purpose of this study is to develop an educational model for video production that leverages Generative AI technology, combined with a Problem-Based Learning (PBL) approach, to verify its practical educational effectiveness. By dividing the video production process into three stages—Pre-Production, Production, and Post-Production—this study aims to propose specific methods for utilizing Generative AI at each stage, thereby helping learners cultivate both creative problem-solving skills and critical thinking abilities. This study sets the following three detailed objectives. First, it aims to analyze the impact of Generative AI technology on the video production process and propose effective educational strategies. Second, it seeks to develop an educational model focused on fostering learners' ability to independently define and solve problems through the PBL approach. Third, by validating the practical applicability of this model in educational settings, the study aims to provide future directions for video production education and contribute to the cultivation of creative and interdisciplinary talents [1].

Keywords: *ChatGPT, AI, Commutial advertizing, Design practice, Learner reflection, Learning effectiveness, PBL project based learning, Video content creation, Viral AD.*

1. Introduction

The acceleration of digital transformation has led to a paradigm shift in the commercial creative industry, where generative AI is quickly becoming more than a tool, but a key technology in the creative process. While the traditional approach to commercial design has been to pursue efficiency with a focus on optimization, the introduction of generative AI opens up new possibilities by maximizing creativity and sophistication [2].

In this context, generative AI is gaining a unique technological edge in various areas of commercial creative production, including image generation, video editing, music production, and more. In particular, in the visual production of commercial creative, generative AI technology Bandi, et al. [2] is

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revolutionizing the existing process in terms of speed, quality and sophistication, opening up new horizons for collaboration between advertisers and creatives [3].

Meanwhile, on-demand courses are gaining traction to incorporate these technological changes into the curriculum [4]. In this study, we explore the process of students solving real-world commercial design production problems using generative AI technology through a problem-based learning (PBL) approach [5]. In particular, we propose an educational model that allows students to simultaneously strengthen their creative thinking and technical skills required in the workplace, including collaborating with industrial companies to work on projects [6]. By collaborating with industrial companies, students can cultivate practical problem-solving skills, experience the practical skills required in the current market, and become employable after graduation.

This study aims to analyze the work efficiency of commercial design production using generative AI, specifically exploring the use cases at each stage of pre-production, production, and post-production, and examining how generative AI technology improves the speed, quality, and sophistication of commercial design production. In addition, by presenting a concrete example of how students can collaborate with industry to complete projects in an on-demand course, we aim to strengthen the link between education and practice and contribute to the development of the commercial advertising design industry [7]. In doing so, this study aims to provide useful baseline data that can be used in practice as well as academic contributions in related fields [8].

2. Background

2.1. Concepts and Principles of Project Based Learning (PBL)

Project-based learning (PBL) is a learner-centred instructional model designed to help students acquire and apply knowledge and skills through the process of solving real-world, unstructured problems. At the heart of PBL is a self-directed learning experience in which learners actively define and solve problems. It's not just about acquiring theoretical knowledge; it's about developing complex thinking, collaboration and practical problem-solving skills.

PBL is becoming an increasingly important learning model, especially in the modern industrial environment where business and technology converge. In commercial advertising design education, learners are encouraged to produce tangible results that meet the needs and objectives of advertisers, while cultivating the creativity and technical skills required in the industry. As a result, PBL is recognised as an effective learning method that combines theory and practice.

2.2. The Convergence of Generative AI and PBL

The digital transformation of the 21st century has revolutionised the way PBL is applied with the development of generative AI. Generative AI provides advanced capabilities in commercial creative design production, including image generation, video editing and music production, and acts as a tool for learners to refine and execute their creative thinking. In particular, generative AI maximises the efficiency of work at each stage of the process, including visual conceptualisation in pre-production, content creation in production, and editing of the final product in post-production.

PBL with Generative AI involves learners defining a problem, exploring ways to solve it using AI tools, and producing a deliverable in an environment that resembles a real-world industrial project. This approach goes beyond simply learning how to use the tools and enables learners to use digital tools strategically to propose creative and practical advertising solutions.

2.3. The Effectiveness of PBL In Commercial Design Production Education

PBL offers the following key benefits in commercial creative design education

2.4. Strategies For Implementing PBL in the Classroom

To design an effective PBL course, it is important to set problems that take into account the level and interests of the learners. In addition, teachers should facilitate project progress, provide feedback,

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and create a realistic learning environment through collaboration with industry, so that students can gain real-world problem-solving experience and a sense of the field through collaboration with industry.

3. Subjects and Team Composition

3.1. Research Contents

This study designs and operates a project to produce visual, design, and video contents based on generative AI for advertising video contents proposed by clients in cooperation with industrial companies. The project is carried out by operating the second-year Commercial Advertising Design class in the second semester of the 2024 academic year as an on-demand education course in the PBL method. Additionally, an examination of the outcomes of self-assessment, reflection journals, and peer evaluation of the learning effectiveness of the PBL-based class for the learners who participated in the class will be conducted, along with the results of measuring satisfaction with the video content output.

3.2. Participants and Team Composition

A total of 22 students participated in this study, which was conducted in the autumn semester of the second year of the Digital Image Design Department at Dong-A University of Broadcasting and Art. After the first week of PBL-based orientation, students were formed into six teams of three to four members. The teams were formed in three stages. In the initial phase, students were assigned individual tasks to explore their own topics and solutions, thereby identifying individual learner characteristics.In the subsequent phase, we sought to integrate design concepts and visual elements. In the final stage, we identified concepts with similar themes and refined them to ensure they were valuable. Ultimately, these processes resulted in the formation of six teams.

3.3. Developing PBL-Based Problems

3.3.1. PBL alignment with on-Demand Courses

The PBL-based Commercial Advertising Design class was designed to be linked to an on-demand course, allowing learners to experience real-world industry projects. In the two-semester course, learners aimed to collaborate with industry to create video advertising content that meets real-world market needs. The course focused on promoting self-directed learning, where learners define problems and explore solutions, rather than simply imparting knowledge.

The tasks were designed based on the specific requirements and conditions provided by the industry during the problem development phase, allowing learners to creatively develop visual concepts, utilize generative AI to explore different design sources, and apply them to their projects. The tasks were set in a real-world industry context and reflected changes and trends in the digital media landscape to provide learners with opportunities to understand and apply the latest digital technologies.

Generative AI and the Use of Digital TechnologiesGenerative AI is an important technical tool in the commercial design process, providing an environment where learners can maximize the sophistication and creativity of their visual expression.Students learned the latest video production technologies and tools, and used them to create advertising content that reflected the needs of industrial companies.In particular, they learned how to use video production solutions in the digital media environment, and experienced the process of creating advertising content optimized for platforms such as social media.

Multifaceted Approach for In-depth Problem SolvingIn this course, we strengthened the following capabilities to help students explore various perspectives in the problem-solving process:Multi-faceted problem analysis:The class encouraged students to examine various factors such as how an ad communicates its message, visual concept, and target audience analysis.Strategic thinking and creative solutions:Designed to help students learn a strategic approach to problem-solving that is both creative and practical.

Rational decision-making skills are honed to ensure learners make logical and objective decisions based on data and market analysis.Enhanced learner-centered self-directed learning: Learners develop

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self-directed learning capabilities through advanced technology utilization and creative problem solving in the content creation process, extending beyond the use of basic tools. In this process, learners are empowered to design and execute their own problem-solving process and continuously improve their output through collaboration and feedback.

Finally, PBL-based problem development is designed to help learners develop competencies that are required in the real world, rather than merely performing tasks. It encourages learners to create content that strengthens the connection between advertisers and consumers, and builds skills that are immediately applicable in the workplace after graduation.

4. Results and Discussion

This problem-based learning (PBL) problem development provided learners with a comprehensive learning experience that cultivated their creative thinking and technical skills simultaneously. The process was not merely about producing a deliverable; it also helped learners to solve their own problems and develop practical and creative skills to meet industry needs [9].

5. Conclusion

This study demonstrated the educational potential of integrating generative AI technology into commercial design production through a problem-based learning (PBL) approach. The combination of generative AI and PBL not only enhanced the creative problem-solving skills of learners but also cultivated critical thinking and technical abilities that are crucial in today's rapidly evolving digital landscape.

The implementation of PBL in the educational context allowed students to address real-world challenges with a practical and creative mindset. By collaborating with industrial companies and engaging in hands-on projects, learners developed the capacity to independently identify and solve problems, a vital competency for future professionals in the creative industry. The application of generative AI at different stages of production—pre-production, production, and post-production—proved to significantly increase the efficiency, quality, and sophistication of commercial design outputs.

Moreover, the practical use of generative AI tools such as Runway, Midjourney, and ElevenLabs has been identified as essential for enhancing the quality of video content production. While these tools are effective for generating visuals, scripts, voices, and other creative assets, achieving high-resolution outputs remains a critical factor for successful application. In real-world production environments, enhancing resolution is frequently required to meet professional standards and improve the overall visual and auditory quality of content.Particularly, although AI video production technology is advancing rapidly every day, adjustments for achieving high-quality video output are still essential, regardless of the prompts used. Tools like Midjourney, Kling, and ElevenLabs demonstrate remarkable capabilities, but to effectively apply them in video content creation, continuous refinement and resolution enhancement are necessary to produce industry-standard results.

Overall, this study contributes to the field of commercial advertising education by providing a well-structured and practice-oriented educational model. The findings offer valuable insights into the integration of generative AI within PBL frameworks, paving the way for the development of more adaptive and relevant educational methodologies. Future research should continue to explore the long-term impacts of this educational model on learners' employability and industry readiness, as well as

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investigate the broader implications of AI-driven creative production and how resolution enhancement techniques can be further optimized to improve content quality.

Transparency:

The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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