

Development of an Intelligent Platform for Automated Assessment and Constructive Feedback on Student-generated Game Character Designs

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Abstract—The objectives of this research are to develop an intelligent platform that integrates artificial intelligence technology to assist in evaluating game character design work by students, to study the results of evaluating students' game character design work, and to provide explanations and creative feedback using artificial intelligence through an intelligent platform, comparing it to evaluation by instructors in the traditional format. This research was a quasi-experimental study, involving 150 students in a control group and an experimental group. The results were evaluated using a questionnaire, and the data were analyzed to compare the two groups using the Independent Samples t-test. The study results indicated that students in the group using artificial intelligence to assist in evaluating their work, providing explanations and creative suggestions through an intelligent platform (experimental group), had significantly higher levels of satisfaction and learning efficiency than the group evaluated in the traditional manner (control group) across multiple dimensions. Particularly in terms of speed and continuity, the experimental group had a significantly higher average satisfaction score with regard to waiting time to receive results ($\bar{x} = 4.89$) compared to the control group, which had an average score of only $\bar{x} = 4.16$ ($p < 0.001$). This aligns with the aspect of student potential development, where the experimental group was able to solve tasks immediately, and the students felt that their workload was significantly reduced ($p = 0.023$, $p = 0.011$). The experimental group showed significantly higher confidence in the assessment results ($p = 0.014$). This data will be highly beneficial for integrating AI technology into game design teaching processes. The goal is to enhance the effectiveness of personalized feedback and promote the continuous development of design skills.

Keywords—artificial intelligence, game character design, automated evaluation, constructive feedback, intelligent platform

I. INTRODUCTION

The gaming and digital content industry has demonstrated potential for continuous exponential growth. This phenomenon directly impacts the demand in the labor market, which focuses on employing personnel with specialized skills, especially in character design. This is crucial for creating a game's identity and appeal. However, the teaching process in this field faces complex and delicate challenges because character design art relies not only on technical skills but also on creativity. Emotional expression and understanding of a story's context, make the instructor's evaluation of the work highly subjective, and requires careful consideration to provide comprehensive feedback on aspects

such as proportion, color usage, art theory, and suitability for practical application. This time constraint often results in students receiving delayed or insufficient feedback. This is a significant obstacle to timely skills development and performance improvement. Although Artificial Intelligence (AI) technology currently plays a significant role in transforming the educational landscape, particularly with the emergence of generative AI capable of creating images, or AI systems used to measure academic achievement in objective formats, a review of the past literature and research reveals that most studies have focused on using AI to replace human work. Or, if the emphasis is on engineering technical evaluation rather than aesthetic and creative evaluation, there is still a lack of clear knowledge regarding the application of AI in the role of a teaching assistant or design mentor capable of analyzing the artistic elements of game characters and providing concrete explanations and creative feedback to students. Even though there are some studies related to the use of AI in image categorization, the issue of using AI to provide in-depth feedback for educational purposes remains contentious due to the complexity of interpreting esthetics and providing nuanced feedback, which general automation systems still cannot effectively support. The objective of this research is to develop an intelligent platform that integrates artificial intelligence technology to assist in evaluating the game character design works of students in the character design course of the creative media technology program at Rajamangala University of Technology Thanyaburi. The focus is on providing precise and constructive explanations and suggestions to support teaching and learning, enabling students to independently verify the accuracy of their work according to art theory. The significance of this research is not limited to being a tool that alleviates the heavy workload of instructors but also aims to elevate educational standards by creating a modern learning environment where students can continuously learn and develop through rapid feedback. The outcome will lead to the production of quality personnel for the game industry. Therefore, the researchers pose the following research questions:

- What are the elements and processes of AI that help evaluate students' game character designs, in addition to providing explanations and constructive feedback through an intelligent platform?
- How can we create an AI prototype to help evaluate students' game character designs, and provide explanations and constructive feedback through an

intelligent platform?

- How does using AI to help evaluate students' game character designs, provide explanations and constructive feedback through an intelligent platform compare to traditional evaluation by instructors?

II. LITERATURE REVIEW

Current character design performance evaluation faces issues of subjectivity and delays in providing feedback. Despite significant advancements in AI technology with regard to object recognition and generative image creation, game character design, which has its own unique criteria, is often overlooked. There are also significant limitations in terms of an inability to explain the reasoning behind such evaluation. This means that the educational needs of students are not met. They need to know the reasons behind the evaluation and how to improve their work. Therefore, this research aims to bridge this gap by integrating the capabilities of computer vision and Natural Language Processing (NLP) technology to develop an intelligent platform that serves as an explanatory assessment system capable of providing in-depth feedback in a concrete and effective manner, building on previous approaches. The following is a review of the literature relevant to this research.

A. Artificial Intelligence for Assessment

In the context of applying technology to education, a highly discussed topic over the past decade has been the use of artificial intelligence and machine learning to reform the assessment process from quantitative measurement to more complex qualitative analysis [1]. Previous research has shown that using models trained on large datasets allows AI to accurately and consistently distinguish the characteristics of work and score according to set criteria. Many researchers agree that the main advantages of AI are its ability to create neutrality, reduce human bias, and significantly lessen the workload of educators, especially in contexts that require quick feedback for students to immediately improve their work [2].

However, from a different perspective, some scholars continue to question the limitations of AI in assessing deeper qualitative dimensions [3]. In particular, the limitations in interpreting the contextual nuances of esthetics and the creator's intent (contextual nuance), as algorithms often focus on technical accuracy or apparent patterns (syntactic analysis) rather than grasping the underlying meanings or emotions that the artwork aims to convey (semantic understanding). Additionally, there is the issue of "hallucination in reasoning," where AI may generate critiques that appear credible and eloquent but lack a connection to sound art theory or provide recommendations that contradict practical possibilities.

These limitations reflect that although the new generation of generative AI has begun to develop the capability to create individual analytical descriptions, the tendency of data processing often leans toward the mean (regression to the mean). This results in AI potentially overlooking unique beauty or innovations that break traditional norms, which are crucial in game character design [4, 5]. The integration of systems that can provide heartfelt and practically applicable creative feedback in an artistic sense is therefore an area that

previous research has not thoroughly covered, particularly in testing the effectiveness of AI as a reliable supplementary tool for high-imagination design tasks. This research aims to prove and fill this gap to elevate the standard of feedback in the creative industry to its highest efficiency.

B. Design Evaluation

In the design and creative industries, a topic of great interest is the development of a systematic process for evaluating work to assess quality across various dimensions, including functionality, aesthetics, and creativity [6]. Most previous research has focused on establishing standards. Many research groups agree that effective evaluation must encompass alignment with objectives, visual quality, and the ability to communicate the work's function. These elements are crucial mechanisms for identifying strengths and weaknesses to iteratively develop the work [7]. However, despite the diverse perspectives of researchers, there remains a significant debate regarding the weighting of scores between aesthetics and originality, with some scholars viewing creativity as the most difficult thing to measure with a single standard ruler [8]. This conflict reflects the limitations of the traditional approach, which relies solely on human evaluation, namely the inconsistency of scoring criteria and the subjectivity that varies in that it is based on the evaluator's personal experience [9]. Additionally, a frequently overlooked aspect in previous research is the time taken to provide high-quality and consistent analytical feedback, which is a critical factor in developing students' skills in the digital age. The data indicate that although previous studies have comprehensively examined theoretical evaluation, there is still a research gap regarding the integration of tools that maintain validity while generating detailed, personalized recommendations [10]. Therefore, this research aims to enhance design evaluation by applying AI to address the need for improvement in terms of validity and speed, thereby systematically and effectively supporting student learning in such a way as to improve on traditional evaluation methods.

C. Game Character Design

In the context of the creative industries and digital content education, a topic that has garnered significant attention on the part of researchers and experts is the game character design process [11]. Character design is viewed as a complex and multi-dimensional process that involves more than just being visually aesthetic. Most previous research consistently states that optimal character design must be an integration of aesthetics and functionality [12]. This must involve considering the character's role, its consistency with the storyline, and the ability to communicate personality through shape and color tone to make the character immediately memorable to players. However, from the diverse perspectives of researchers, there are still conflicting opinions regarding the priority between artistic identity and technical suitability, with art anthropology researchers focusing on strong emotional attachment and the stories behind the characters [13]. While game engineering researchers often prioritize animation support and model creation, this conflict and differing perspectives reflect the difficulty in reaching a conclusion when evaluating students' character design work based on a single criterion. It also highlights the limitations

of previous approaches where instructors often assess work based on their own specialized expertise, leading to an imbalance in scoring criteria between aesthetic and functional dimensions [14]. Additionally, a glaring omission in previous research is the establishment of evaluation standards that can dynamically and concretely analyze the connection between image design and in-game roles. Human evaluation in large classes often fails to provide in-depth explanations that comprehensively cover all these dimensions. This highlights the fact that, despite previous studies delving deeply into character design principles, there is still a need to develop intelligent tools that can synthesize these complex elements—in terms of shape, color, and game context—into accurate and systematic creative suggestions [15]. Therefore, this research aims to utilize AI technology as a medium to connect character design disciplines with accurate assessment, bridging the gap in skill development for students and overcoming the limitations of traditional assessment methods [16].

D. Intelligent Platforms

In the era of digital transformation, a widely discussed topic in educational technology circles is the development of digital infrastructure that goes beyond mere connectivity or information presentation, aiming to become an intelligent platform integrating AI and machine learning with big data [17]. Numerous previous studies have shown that intelligent platforms have the potential to learn and adapt independently of user behavior, focusing on creating added value through proactive services and context-aware interactions. Most researchers agree that the core of such systems is their ability to provide personalized information in such a way as to accurately understand and predict user needs [18]. However, despite the diverse perspectives of researchers, there remains debate about the role of platforms in performance evaluation. One group of scholars believes that platforms should serve only as a supporting tool, awaiting human decision-making [19], while another group is pushing for platforms to have decision-making and automated processing capabilities in order to enhance active learning efficiency. Consequently, these differing perspectives reflect the limitations of the approaches adopted in previous work, which often involved developing traditional platforms that focused solely on being a repository for work, but lacked the ability to analyze and synthesize feedback in real time [20]. Additionally, a glaringly overlooked issue is the development of platforms that can serve as complete learning ecosystems for specialized design tasks such as game character design, which requires image processing and the delivery of dynamic creative feedback [21]. This indicates that although the previous work has thoroughly examined platform infrastructure, it has not addressed one important aspect: the integration of a design performance evaluation model that can present individual scores with explanations via a user interface tailored to facilitate immediate work improvement. Therefore, this research aims to develop an intelligent platform as a central space for bridging the gap between receiving assignments and delivering feedback, creating interactions that effectively and sustainably promote student learning [22].

The fundamental concept of this intelligent platform is

rooted in formative assessment theory, which focuses on using assessment as a tool to enhance learning rather than judging achievement at the end of the learning process [23]. Unlike traditional assessments that emphasize scoring or judging results, the platform's Artificial Intelligence (AI) continuously monitors and analyzes learners' learning processes, providing real-time constructive feedback to create a feedback loop conducive to continuous development. This aligns with the idea that quality feedback can bridge the gap between current competency levels and learning goals [24, 25].

This process enables learners to clearly identify their strengths and areas for improvement in character design, based on the principle that assessment for development must include understanding goals, success criteria, and self-reflection [26]. Additionally, continuous feedback supports self-regulated learning, which is a key mechanism for developing advanced skills and creativity [27]. Therefore, this platform promotes a learning environment where learners take an active role and can continuously develop their potential.

III. MATERIALS AND METHODS

This research involved dividing the experiment into 3 phases as follows:

Phase 1: The synthesis of AI elements and processes helps evaluate students' game character designs, providing explanations and creative feedback through an intelligent platform, with information retrieved from the SCOPUS database and data extracted by using the obtained information to create a synthesis table and categorize data related to the roles, functions, and characteristics of generative AI used as a creative assistant in the character design process for students in game design courses. A model of the elements and processes of AI is then designed to help evaluate students' game character designs, providing explanations and creative feedback through the intelligent platform.

Phase 2: Creating AI prototypes helps evaluate students' game character designs by providing explanations and constructive feedback through an intelligent platform, using the following method:

Step 1: Structuring the submission and storage system to prioritize student convenience and data organization for AI processing. The tools used are Google Forms + Google Drive, with Google Forms serving as the front-end for students to upload design images. The data is automatically stored in a Google Drive folder. Bubble.io is then used to create a visually appealing application without writing code. The system is configured to rename files according to the student's reference code to prevent data confusion and facilitate later data retrieval for display.

Step 2: Criteria & model tuning. The key is to teach the AI what a good character design for this subject is. We use OpenAI GPT-4o as the image analysis model. We then use system prompting to write background instructions to specify the evaluation criteria, creating a scoring system that tests shadow clarity, checks costume plausibility, and compares redundancy to assess uniqueness. We then incorporate these criteria into the system prompt to guide the AI's analysis. Example prompt for this research:

“You are an experienced game design professor. Please review the students’ game character design works using a scoring rubrics format with a score range of 0-5, evaluating the works in four areas as follows: 1) esthetics and composition, 2) clarity of character personality, 3) drawing and coloring skills, and 4) creativity and innovation in design. Each area should be weighted equally at 25%, with a total score of 100 points. Additionally, provide suggestions for improving the works.” This prompt has been reviewed by three experts.

Step 3: Analysis and evaluation process to connect images to the AI model for evaluation using Zapier as the connection tool. When a student submits work in Step 1, the system immediately sends the images and criteria information from Step 2 to the AI for analysis. The AI is instructed to return the results in a data structure consisting of scores for each topic, strengths, areas for improvement, and constructive feedback.

Step 4: Creating feedback and dashboards involves transforming numerical and textual data into easy-to-understand diagrams using the Looker Studio tool. It connects to data from Google Sheets to create spider graphs that show strengths and weaknesses. Then, Canva Bulk Create is used to automatically generate visually appealing feedback dashboards from the AI-provided data. The dashboards are designed to compare the class average with the individual student’s own score, along with recommendations to motivate improvement.

Step 5: A review is undertaken by the instructor with regard to accuracy and correctness before the results are transmitted to the student. Airtable is used as a database for managing tasks, with approve or edit buttons for the instructor to click for reviewing. When the AI finishes evaluating, the results are displayed in Airtable. The instructor can view the work alongside the AI’s evaluation results. If they agree, the instructor can approve and forward the work or edit some text if the AI has made a mistake.

Step 6: Provide high-quality and timely feedback to students. The assessment results are then delivered to the student via MailerLite, emailing them directly to the student. MailerLite then notifies the student when the results are ready. The information is delivered in 3 main parts: the provision of assessment score, workpiece, and areas for improvement or additional praise, along with additional learning resources. Next, the use of AI elements and processes are evaluated by 9 experts with regard to assisting the assessment of the student’s design of the game character, including providing explanations and making creative suggestions through an intelligent platform. These experts are from the fields of generative AI and technology, character

design and art, and communication and educational technology. Finally, we summarize the assessment results.

Phase 3: Compare the results of using AI to assist in evaluating a student’s game character designs, provide explanations and creative feedback through an intelligent platform, with traditional evaluation methods. This research is a quasi-experimental study involving a sample group of undergraduates in game design courses at the Faculty of Mass Communication Technology, Rajamangala University of Technology Thanyaburi. A total of 150 people were divided into two groups. Group 1 (experimental group) consisted of 75 students who had their game character design performance evaluated with explanations and constructive feedback provided through the course platform. Group 2 (control group) also consisted of 75 students who were evaluated using the standard method in the game design course. The same instructor taught both the experimental and control groups. However, the control group was evaluated on their character design work solely by the instructor, while the experimental group was evaluated using the model of this research, with an instructor providing guidance in the final step. The evaluation was conducted using a questionnaire dealing with assessing speed and continuity, accuracy and standardization, quality of feedback, psychology and communication, and student potential development. The researcher tested the reliability of the questionnaire using Cronbach’s Alpha Coefficient with a pilot study sample of 30 people, finding an overall reliability value of 0.83. Additionally, to assess content validity, the researcher had three experts evaluate the alignment of the questions with the research objectives and calculated the Index of Item-Objective Congruence (IOC). The evaluation results showed that all questions had an IOC value greater than 0.50. The differences between the two groups were analyzed and compared using the independent samples t-test.

IV. RESULTS

● AI components and processes for character evaluation

The researchers synthesized AI components to aid in the evaluation of students’ game character design work, offering explanations and creative feedback via an intelligent platform. The researchers synthesized the results by searching for information in the SCOPUS database. The data obtained was used to create a synthesis table of AI components to assist in evaluating the students’ game character designs, providing explanations and creative feedback through an intelligent platform, as shown in Table 1 and Fig. 1.

Table 1. Artificial intelligence components to assist in evaluating students’ game character designs, providing explanations and constructive feedback via an intelligent platform

Artificial intelligence components for evaluation and feedback	[1–3]	[4–6]	[7–10]	[11–13]	[14–16]	[17–19]	[20–29]	[30–33]	Researcher
Intelligent Platform	√	√	√		√	√		√	√
Design Principles of Game Characters	√		√	√		√	√	√	√
Description and Suggestions		√	√	√	√		√	√	√
Performance Evaluation	√	√		√		√	√		√
AI Automation	√	√	√		√	√	√	√	√

Summary of the synthesis results of artificial intelligence components to assist in evaluating the game character design work of students, along with explanations and creative

suggestions provided through an intelligent platform. The results of synthesizing AI components to assist in evaluating the game character design work in this study show that using

intelligent platform technology as a central learning hub, serving as the primary channel for connecting data between learners and the cloud, leads to an effective evaluation process. The system employs game character design principles as standards for analyzing students' work, focusing on aspects such as proportion, color usage, and character personality communication. This analysis is facilitated by an AI automation process. This is an automated system that processes technical data, thereby making the evaluation of work faster and more accurate than by using traditional measures. Once the processing is complete, the system sends the results to the learner in the form of a performance evaluation, which is a concrete measure of performance, such as assigning grades or score levels. This allows students to immediately become aware of their abilities, along with providing them with in-depth descriptions and suggestions. This transforms complex evaluation results into easy-to-understand and practical recommendations, such as with regard to improving the dimensions of light and shadow, leading to a learning cycle where students can continuously use the feedback to further improve their work. AI serves as a support assistant in terms of both evaluation and learning.

This process synthesizes the use of artificial intelligence to evaluate students' game character designs, providing explanations and constructive feedback through an intelligent platform. As shown in Table 2, the researchers synthesized information from the SCOPUS database, using the data obtained to create a table summarizing the process of using AI to assist in evaluating students' game character designs, along with explanations and creative feedback through an intelligent platform.

Based on the synthesis of the process of using AI to help evaluate students' game character designs through an intelligent platform, the detailed integrated workflow can be summarized as starting with the submission of work and the initial analysis. Students upload both their design image files and concept documents into the system, allowing the AI to process and analyze artistic elements, and interpret the content simultaneously. The system then proceeds to the

evaluation criteria stage, which is comprehensive across four key dimensions: initiative and novelty to measure creativity, to analyse the suitability and functionality of the game to determine its consistency with real-world applications, completeness and detail checks, and aesthetic quality measurement based on art composition principles. In terms of evaluation and feedback generation, AI acts as an intelligent assistant for automated scoring based on set criteria, along with generating analytical explanations that break down the reasons for the scores in each section. Most importantly, it provides creative feedback to guide the further development of the work and improve its quality, as shown in Fig. 2. All this information is sent to the platform for results presentation in the form of a clear, segmented summary dashboard for students to use for self-improvement, and for instructors to monitor the overall progress and development of students in the class, as shown in Fig. 3.

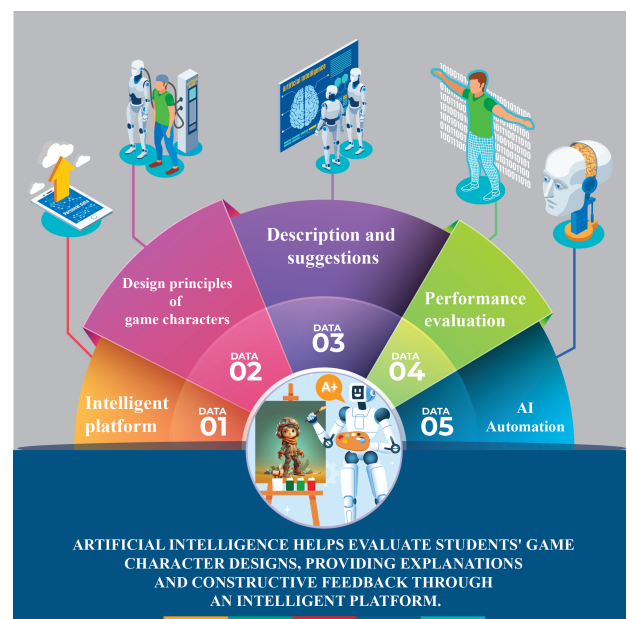


Fig. 1. An AI-powered model of components designed to help evaluate students' game character designs, providing explanations and constructive feedback through an intelligent platform.

Table 2. The process of using artificial intelligence to evaluate students' game character designs and provide explanations and constructive feedback through an intelligent platform

AI Evaluation and Feedback Process		[1–3]	[4–6]	[7–10]	[11–13]	[14–16]	[17–19]	[20–24]	[25–28]	Researcher
Submission of results and preliminary analysis	Students upload their character design work	√	√	√	√		√		√	√
	Analyze images with AI		√	√		√	√	√		√
	Analyze concept documents	√		√	√		√	√	√	√
Set evaluation criteria	Originality and Innovation	√	√		√	√		√	√	√
	Functionality and game suitability	√					√	√		√
	Completeness and detail		√	√		√		√	√	√
	Aesthetic quality	√		√		√	√		√	√
Evaluation and Feedback	Scoring according to criteria		√	√		√	√	√		√
	Creating analytical explanations	√		√	√	√	√		√	√
	Generating constructive suggestions	√	√	√		√		√	√	√
Presenting results on the platform	Dashboard summarizing results for students	√		√	√		√	√	√	√
	Summary dashboard for instructors	√	√		√	√		√	√	√
	The instructor verifies the accuracy		√	√		√	√	√	√	√
Instructor review	The instructor enters the correction or confirmation data.	√		√	√		√	√	√	√

According to Table 2, the results of the evaluation of the characteristics of digital mentors as creative assistants and advisors for character design showed that the overall

characteristics were deemed to be at a very high level, with an overall mean of 4.19 (standard deviation ± 0.28). When considering each aspect individually, the highest evaluation

was with regard to creativity and process acceleration, with a mean of 4.37 (± 0.20), followed by guidance and learning reinforcement, with a mean of 4.33 (± 0.29). These two aspects demonstrate that the experts valued the system's role in generating results and supporting learning highly. In terms

of interaction and reliability characteristics, these were also highly rated, but with a lower average of 3.85 (± 0.34). This may indicate areas that need attention in further development of the system in terms of interactivity and trustworthiness.

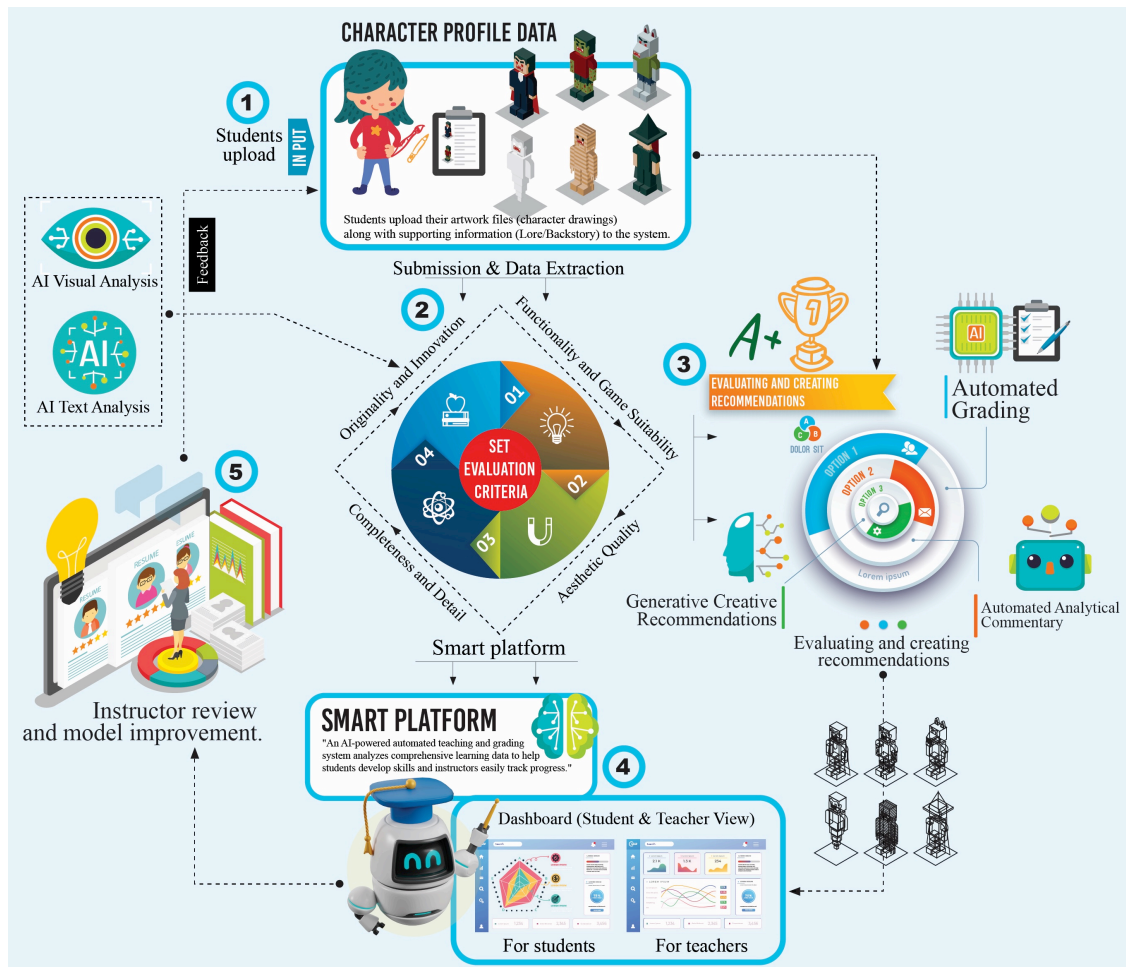


Fig. 2. The process of evaluating students' game character design work, providing explanations and creative feedback using artificial intelligence through an intelligent platform.

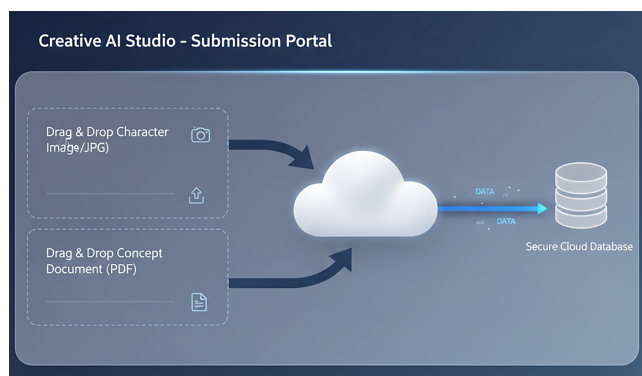


Fig. 3. System delivery and storage structure layout: A screenshot of the interface with slots for dragging character image files (PNG/JPG) and placing PDF documents.

An explanation of the artificial intelligence process for illustrating and providing constructive feedback to students through an intelligent platform consists of the following components.

Input: This starts with the students submitting their portfolio files to the platform. These files consist of two main parts: visual arts data, including character drawings in digital

file format (e.g., .PNG or .PSD) that shows details of lines, colors, and proportions, and contextual information, including story descriptions, character backgrounds, personalities, and character special abilities, for the system to use as a database for matching.

Process: Upon receiving the information, the AI system will work in two parts. The first part is Visual & Text Analysis, which extracts artistic elements and interprets the story. It then enters the Multi-Dimensional Evaluation stage, where the work is checked against standard criteria for shadow clarity, costume reasonableness, and redundancy comparison to determine uniqueness.

Output: The output generated by the system will be in the form of generative feedback, which goes beyond just providing a score. It will include constructive suggestions that identify areas for improvement, such as recommending adjustments to color contrast. Additionally, the system can create refined visualizations, or style-adjusted example images, to provide students with concrete guidance, as well as selecting learning materials specifically tailored to each student's individual weaknesses.

Feedback: The final step is to display all the data through a smart dashboard to create a continuous development cycle.

To analyze their performance, students will receive reports in the form of spider graphs, while instructors will receive an overview of the issues most students are facing. This will help instructors tailor their teaching content to be more targeted and effective, as shown in Fig. 2.

- Creating an artificial intelligence prototype

Building an AI system to help evaluate game character designs through an intelligent platform begins with laying a comprehensive technological and system architecture design foundation. The first step is developing the intelligent platform which serves as the infrastructure for receiving data from students, including digital art image files and concept explanation documents. This system must be designed with a robust database for storing and retrieving large amounts of data to facilitate advanced processing. The next step is to select and customize AI models. These are divided into two main parts: computer vision for analyzing visual images to verify proportions, lines, and artistic composition, and Natural Language Processing (NLP) for interpreting conceptual text. To verify the consistency between the design work and the intended game context, the next crucial step is the digitalization of rubrics, or the conversion of art performance evaluation criteria into a set of computational instructions, as shown in Fig. 4. Developers must translate criteria such as originality, completeness, and aesthetic value into quantifiable scores that AI can measure. This step often involves comparing the work against a database of internationally standardized game character images to provide the AI with a benchmark for judgment. In this stage the data is compared with a database of internationally recognised game character images to provide the AI with a benchmark for decision-making. Once the system can process the data, it enters the automated feedback generation stage which involves processing the analysis results through a generative AI process. To compile an analytical explanation and creative suggestions instead of just providing numerical scores, the system offers concrete recommendations such as adjusting color tones to convey the character's power or adding details where they are missing, to encourage students to develop their design skills to a higher level, as shown in Figs. 5 and 6. Next, the user interface, or dashboard interface, is developed. This separates functionality into two main views: the student's section, which focuses on displaying progress and providing easy-to-understand feedback and the part for instructors, which focuses on summarizing the overall class and common error statistics to improve teaching content, as shown in Fig. 7. The final indispensable step is the human-in-the-loop validation process, a system that allows instructors to review and confirm the AI's assessment results before they are sent to students. This prevents errors from algorithms and increases flexibility in cases of highly unique artistic works. Therefore, this entire process is a blend of computer science and humanities, creating a new-age teaching support system that reduces administrative workload for instructors while providing high-quality and rapid feedback to both instructors and students, as shown in Fig. 8. The researchers proposed a guideline for using artificial intelligence to evaluate game character designs. This system assists in assessing students' work by providing detailed explanations and constructive feedback through the intelligent platform, as shown in Fig. 9.

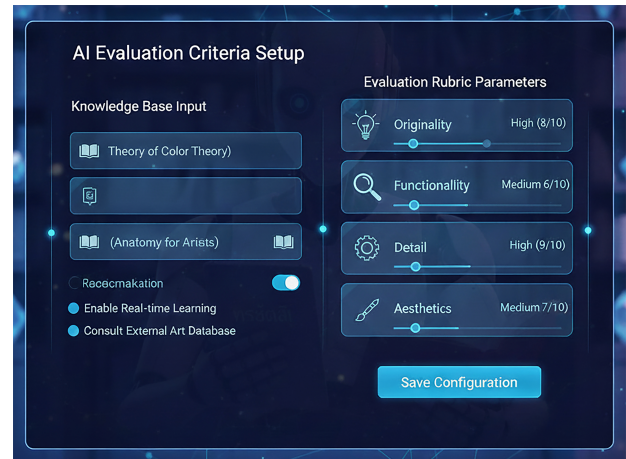


Fig. 4. Setting thresholds and preparing ai from interface screenshots: Threshold settings for “color theory” and “anatomy” with 4 evaluation criteria (originality, functionality, detail, aesthetics) displayed on the interface screen.



Fig. 5. The analysis and evaluation process involves sending system screenshots to the AI vision engine.



Fig. 6. Generating feedback and dashboards from images.

The evaluation results showcase an artificial intelligence prototype designed to help assess students' game character designs, providing explanations and constructive feedback through an intelligent platform.

The researcher created a questionnaire aimed at 9 experts in artificial intelligence and technology, character design and art, and communication and educational technology with regard to evaluating the results of building a digital mentor

prototype using generative AI for creative thinking in character design for mass communication technology students.



Fig. 7. Instructors can review the results generated by AI.



Fig. 8. Delivering assessment feedback to students with explanations and constructive suggestions provided through an intelligent platform.

The overall evaluation results were found to be excellent, with an average total score of 4.66 ± 0.09 . The most significant highlight was the system's ability to reduce student working time which unanimously received the

highest scores (5.00 ± 0.00). This reflects the effectiveness of the intelligent system in terms of assisting with workload management. This aligns with the user experience and system performance aspects (4.78 ± 0.46), where quick response and ease of use are key motivators, while the learning impact (4.74 ± 0.48) and the quality of constructive feedback (4.63 ± 0.58) are also important. This demonstrates that AI not only reduces learning time, but can also foster creativity and provide practical avenues for developing character design work, even though the specificity of the instructions received a slightly lower score (4.33), as shown in Table 3. However, overall, the academic accuracy and ease of language presentation remain highly satisfactory. In conclusion, this AI prototype on an intelligent platform is a highly effective tool for supporting learning and the tangible development of skills in game character design.

Table 3. The results of the evaluation of the artificial intelligence prototype created to assist in evaluating students' game character designs, providing explanations and constructive feedback through an intelligent platform

Evaluation		Mean $\pm$ S.D.
Assessment of accuracy by academic experts	Content Accuracy	4.56 ± 0.73
	Analytical accuracy	4.67 ± 0.50
	Compliance with criteria	4.44 ± 0.73
	Total	4.56 ± 0.65
Quality of constructive feedback	Feasibility of implementation	4.78 ± 0.44
	Promoting creativity	4.78 ± 0.44
	Specificity	4.33 ± 0.87
	Total	4.63 ± 0.58
In terms of presentation and appearance	Language and communication	4.67 ± 0.71
	Use of language	4.56 ± 0.73
	Ease of understanding	4.56 ± 0.73
	Fluidity in interaction	4.67 ± 0.50
In terms of user experience and system performance	Total	4.61 ± 0.67
	Response speed	4.89 ± 0.33
	Ease of use	4.89 ± 0.33
	Access to information	4.56 ± 0.73
Impact on learning	Total	4.78 ± 0.46
	Boosting confidence	4.56 ± 0.73
	Reducing working time	5.00 ± 0.00
	Overall satisfaction	4.67 ± 0.71
Total (1+2+3+4+5)		4.74 ± 0.48
Total (1+2+3+4+5)		4.66 ± 0.09

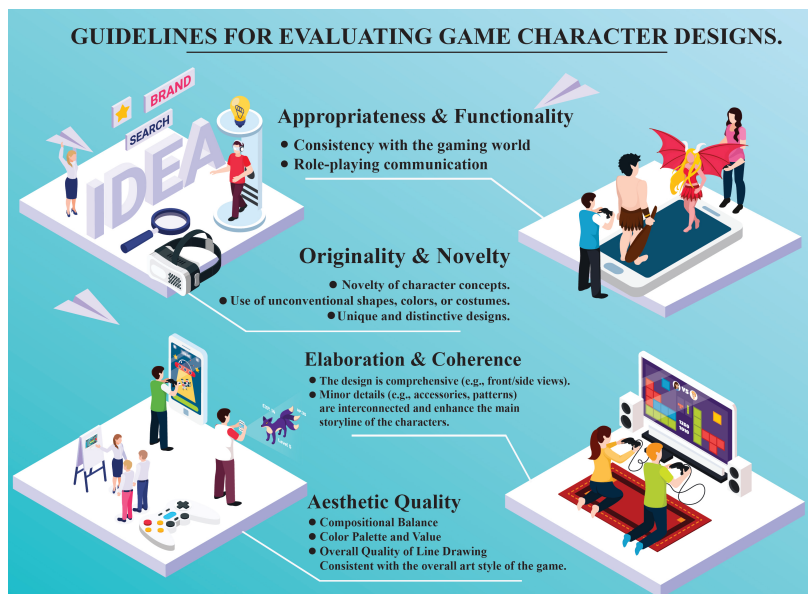


Fig. 9. Guidelines for evaluating game character design using artificial intelligence to help assess students' game character design work, providing explanations and creative suggestions through an intelligent platform.

- The results of the comparative evaluation between using artificial intelligence to assist in assessing student work in game character design.

The evaluation results related to 150 students in the Game Design course at the Faculty of Mass Communication Technology, Rajamangala University of Technology Thanyaburi. The students were divided into two groups of 75 participants each: Group 1 used the course platform to evaluate their game character designs, including the provision of creative explanations and suggestions. Group 2 used the standard evaluation method of the Game Design course. The results showed that the experimental group had 76.00% male and 24.00% female participants, with an average age of 19.25 ± 0.79 years. The control group had 81.33% male and 18.68% female participants, with a average age of 19.25 ± 0.81 years, as shown in Table 4.

The analysis of the comparative research results between Group 1 and Group 2 revealed that students in Group 1 had significantly higher levels of satisfaction and learning

efficiency this in Group 2 across multiple dimensions. Specifically, in terms of speed and continuity, the experimental group had a significantly higher average satisfaction score for waiting time, reaching $\bar{x} = 4.89$, compared to the control group with an average of only $\bar{x} = 4.16$ ($p < 0.001$). This aligns with the aspect of student potential development, where the experimental group could immediately correct work and felt a significant reduction in student workload ($p = 0.023$, $p = 0.011$). In addition, students in this group showed significantly higher confidence in the assessment results ($p = 0.014$). In terms of accuracy and standards, as well as the quality of feedback, both groups had similar “very good” assessment results, as shown in Table 5.

Table 4. General information with regard to research participants ($n = 150$)

Info	Group 1 ($n = 75$)	Group 2 ($n = 75$)
Male	57 (76.00)	61 (81.33)
Female	18 (24.00)	14 (18.68)
Age (years)	19.25 ± 0.79	19.25 ± 0.81

Table 5. Comparison between the evaluation of using artificial intelligence to assist in assessing the game character design performance of students, along with explanations and creative suggestions provided through an intelligent platform, and evaluation in the normal format

Evaluation		Mean $\pm$ S.D.		t	p-value
		Group 1 ($n = 75$)	Group 2 ($n = 75$)		
In terms of speed and continuity	Result Waiting period	4.89 ± 0.31	4.16 ± 1.07	5.72	<0.001*
	Availability	4.83 ± 0.38	4.69 ± 0.64	1.56	0.061
	Job submission frequency	4.91 ± 0.29	4.59 ± 0.76	3.42	0.0004*
In terms of accuracy and standards	Accuracy of scores	4.08 ± 0.49	4.81 ± 0.46	-0.17	0.568
	Theoretical accuracy	4.71 ± 0.59	4.64 ± 0.67	0.65	0.259
	Transparency	4.72 ± 0.51	4.61 ± 0.68	1.09	0.138
Quality of feedback	Aesthetic depth	4.36 ± 0.98	4.69 ± 0.61	-2.49	0.993
	Variety of recommendations	4.69 ± 0.61	4.76 ± 0.56	-0.69	0.755
	Motivation	4.57 ± 0.77	4.73 ± 0.64	-1.38	0.915
In terms of psychology and communication	Confidence in the evaluation results	4.85 ± 0.39	4.64 ± 0.73	2.23	0.014*
	Two-way interaction	4.65 ± 0.80	4.81 ± 0.46	-1.51	0.933
In terms of developing students' potential	Immediate editing of work	4.88 ± 0.33	4.72 ± 0.61	2.01	0.023*
	Confidence in creativity	4.72 ± 0.61	4.69 ± 0.61	0.27	0.395
	Reduced student workload	4.84 ± 0.37	4.63 ± 0.71	2.30	0.011*

* p -value < 0.05

V. DISCUSSION

The research findings indicate that the integration of AI through intelligent platforms significantly enhances the quality of feedback in line with the learner-centered approach. The experimental group rated their satisfaction with the speed of assessment at 4.89, reflecting AI's potential to break the time constraints of traditional instructors. Receiving immediate feedback allows learners to identify shortcomings and improve character design while still maintaining enthusiasm, a critical factor in enhancing learning efficiency, rather than losing interest while waiting for long assessment results. An interesting point is the balance between AI assessment and expert supervision. The mechanism requiring instructors to review results before sending them to learners is a crucial step in maintaining

academic standards and reducing the risk of AI errors. This research thus confirms that AI does not come to “replace” art and design instructors but serves as an “intelligent teaching assistant” managing quantitative assessments and preliminary data, making it feasible to provide personalized feedback to a large number of learners within the limited workload of instructors. Although the experimental group received feedback through an eye-catching dashboard and spider charts, which might be seen as a format factor that creates more satisfaction than traditional methods, the analysis of the results in Table 6 revealed an interesting point: the highest satisfaction scores of the experimental group were concentrated on ‘speed of result waiting’ (4.89) and ‘workload reduction’ (4.84), while the score for ‘aesthetic depth’ of the experimental group (4.36) was significantly lower than that of the control group (4.69).

Table 6. Results and comparison of advantages and limitations

Dimensions	AI-based Intelligent Platform	Traditional Instructor Assessment
Speed and Continuity	Excellent: Provides near real-time feedback, maintaining learning momentum and reducing cognitive lag.	Limited: Feedback is often delayed due to instructor workload, which may hinder the iterative design process.
Scalability	High: Capable of handling large cohorts (e.g., 150+ students) simultaneously without compromising feedback detail.	Low: Scalability is strictly constrained by the number of experts and their available time.
Aesthetic Nuance	Moderate: Relies on predefined rubrics and patterns; may lack deep artistic intuition and cultural context.	Superior: Offers profound insights into creativity, emotional resonance, and complex aesthetic elements.

Although statistical analysis (t-test) confirmed a high level of satisfaction, qualitative discussions revealed limitations in creativity. While AI excels at analyzing artistic components according to standard criteria, the subtlety of esthetics and out-of-the-box thinking remain skills that humans perform better [34]. The immediate learning cycle generated by AI allows learners to overcome technical obstacles instantly. However, to prevent learners from becoming overly reliant on AI's recommendations and losing their individuality, researchers suggest using AI as a foundation for structured guidance and providing opportunities for learners to discuss or challenge the evaluation results with instructors. The application of AI in qualitative assessments, such as game design, demonstrates the potential to create flexible and scalable learning environments in the future [35]. As shown in Fig. 9, which presents four main evaluation criteria: 1) appropriateness and functionality, 2) novelty, 3) detail and consistency, and 4) esthetic quality, to elevate design standards to a professional level that truly meets the needs of the gaming industry.

VI. CONCLUSION

This study concludes that AI-driven intelligent platforms play a crucial role in supporting character design education. These platforms have the capability to analyze artistic elements and provide precise and personalized recommendations, enabling learners to identify flaws more effectively than traditional teaching methods. Additionally, the integration of AI helps reduce subjectivity in art evaluation and sets new standards for education in the digital age. It can be scaled to other highly abstract fields such as architecture, creative writing, and visual arts, which often face bottlenecks in providing personalized guidance due to the workload of instructors. However, there are still limitations in assessing abstract dimensions, including creativity and the spirit of expression in the work. Limitations in the existing dataset may also restrict the coverage of contemporary art practices that aim to challenge traditional norms. The quasi-experimental design, despite controlling for instructor and curriculum variables, may still be affected by the lack of complete random sampling, which could lead to fundamental differences in students' skills or intrinsic motivation influencing the outcomes. Future research should expand the scope of development to include Emotional Intelligence (EQ) capabilities to enhance the assessment of character emotional communication. Further investigation into integration with game engines and expansion into other design domains such as scene design and User Interface (UI) design is recommended to position this platform as a comprehensive tool for sustainable game development.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

V.P. conceived the study, developed the AI-integrated platform, and drafted the manuscript. P.T. managed the data curation, Scopus review, and validation process. Both authors contributed to the methodology, formal analysis, and final manuscript revision. All authors have approved the final

version.

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