

TAMAGO: Full Game Art Gameful System for Animation Thesis Supervision

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Abstract—Final project supervision platforms in higher education typically adopt administrative interfaces that may underserve students in creative disciplines whose projects unfold as months-long narrative journeys. This paper presents TAMAGO (Tugas Akhir Mahasiswa GO!), a gameful supervision system built around full game art aesthetics, visual novel dialogue, and an egg-hatching metaphor tied to animation production pipeline stages. A formative single-case evaluation was conducted with seventeen undergraduate animation students at a state arts institute in Indonesia. Each session ran 60 to 75 minutes and included approximately twelve minutes of prototype interaction across five task scenarios, followed by four quantitative measures (System Usability Scale, a twenty-seven-item gameful experience inventory, short User Experience Questionnaire, and a domain-specific aesthetic experience and metaphor scale) and a semi-structured interview analyzed thematically. TAMAGO achieved a mean usability score of 74.4 (Good), hedonic quality of 2.65 and pragmatic quality of 2.06 (both Excellent), aesthetic experience of 6.33 and metaphor perception of 6.27 on seven-point scales, and intention to use of 6.00. Aesthetic experience showed a strong association with intention to use in this sample. Because these domain-specific aesthetic and metaphor items were adapted rather than validated through confirmatory factor analysis, and because scores clustered near the top of the scale, their discriminant validity from hedonic quality remains uncertain, and the associations are best read as exploratory rather than as stable effect sizes. Three themes emerged from interviews: the egg metaphor was read as an experiential mirror, full game art functioned as affective counterweight to standard campus software, and animation students engaged with the system as craft critics. This work is positioned as a design case with exploratory empirical grounding, illustrating that full game art can achieve acceptable usability alongside rich aesthetic design within one educational supervision context.

Keywords—gameful design, full game art, aesthetic experience, animation education, narrative framing.

I. INTRODUCTION

Few students remember their final project as a pleasant process. In animation and other creative disciplines, the work stretches across a long production pipeline, from conceptualization and pre-production through production, post-production, and finally the defense. Somewhere in those months motivation ebbs, fatigue accumulates, and progress starts to feel invisible even when it is real. Educational research has long placed learner autonomy and sustained motivation at the center of academic persistence in higher education [1]. The information systems built to support thesis

supervision rarely reflect that insight. They wear an administrative face of form fields, upload buttons, timeline trackers, and compliance checklists, and most adopt the flat visual register of enterprise software [2]. The convention favors bureaucratic efficiency over experiential quality, and it quietly recasts the thesis journey as a queue of submissions instead of a narrative arc of becoming.

Gamification has been one response to this experiential gap. Yet most gamified educational tools remain anchored to what the literature calls PBL: points, badges, and leaderboards [3], [4], [5]. Recent work continues to show that such surface-level elements, when pasted onto otherwise conventional interfaces, produce limited and often short-lived motivational gains [6]. The theoretical reason is well understood. The MDA framework distinguishes Mechanics, Dynamics, and Aesthetics as three tightly coupled layers of game experience [7], and PBL gamification typically engages only the Mechanics layer, leaving the Aesthetics layer (the emotional texture of experience) underdeveloped. Reviews of gamified information systems reach a similar conclusion: aesthetic experience, rather than reward structures, has been identified as an important correlate of continued intention to use [8], [9], [10], [11].

A different design direction opens up when gameful systems are built around full game art: illustrated environments, character-driven dialogue, diegetic and metaphorically framed interface elements, and narrative metaphor treated as first-class design properties [12] rather than decorative surface [8], [13]. Commercial games have long treated this approach as central to affective engagement. Non-entertainment contexts, though, especially educational systems that students return to over months, have rarely explored it. The open question is twofold: can full game art aesthetics be deployed without eroding usability and task efficiency in a system students must rely on for serious academic work, and do such aesthetics resonate with students whose training already centers on visual storytelling? Full game art is used here as a design descriptor for this constellation of properties, not as an established theoretical category.

Earlier work by [Anonymous, 2025] proposed TAMAGO (Tugas Akhir Mahasiswa GO!) as a gameful supervision system built on three distinctive properties: full game art aesthetics with illustrated environments, visual novel-style dialogue with animated faculty characters, and an egg-hatching metaphor in which the visual state of an egg progresses across six stages tied to the animation production

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pipeline [14]. That earlier study established the design rationale and interaction concept through Research through Design, but did not include empirical evaluation with end users. The present study takes up that missing evaluation.

This paper is framed as a formative single-case evaluation of the full game art variant of TAMAGO in a single institutional context, the Animation Study Program at a state arts institute in Indonesia. A parallel investigation, an experimental between-subject design comparing low, moderate, and high visual fidelity, lies outside the present scope. The narrow scope is a deliberate methodological choice. Animation education provides a setting in which students' visual literacy and their familiarity with narrative structure create distinctive conditions for evaluating an aesthetically rich gameful system.

Five research questions guide the study. RQ1: How do animation students perceive the usability of the full game art variant of TAMAGO? RQ2: What profile of gameful experience dimensions emerges from their interaction with the system? RQ3: How is aesthetic experience perceived, and how does it relate to intention to use? RQ4: How is the egg-hatching metaphor interpreted by students whose discipline trains them in visual storytelling? RQ5: What design implications arise for gameful systems in animation education?

The paper is best read as a design case with exploratory empirical grounding, not as a hypothesis-testing study, and within that frame it offers three contributions. The first is the design case itself: full game art aesthetics deployed in an educational supervision system, with usability that, in this setting, did not appear to suffer under the aesthetic load. The second is documentary. Among animation students, the study records high self-reported aesthetic experience and metaphor resonance alongside a strong association between aesthetic experience and behavioral intention to use. The third is a set of concrete design tensions, among them the longitudinal durability of narrative framing and the need for modes that accommodate different temperaments, that point toward the next iteration of gameful systems for creative education.

II. RELATED WORK

A. Gamification and Its Limits

Deterding and colleagues define gamification as the use of game design elements in non-game contexts [3], and educational technology has taken the idea up widely. The reviews and meta-analyses report a familiar mix: real but short-lived gains in engagement, shadowed by three recurring concerns, namely novelty effects that fade, shallow engagement that drifts from learning goals, and a cramped view of what game elements can actually contribute [6]. Experimental work on specific elements confirms that points and levels alone do little to enhance intrinsic motivation [15]. These findings have prompted calls to move beyond PBL toward what Deterding terms gameful design [16]: designing for whole-experience qualities rather than isolated mechanics [2].

B. The MDA Framework and the Aesthetics Layer

MDA, from Hunicke, LeBlanc, and Zubek, describes three tightly coupled layers: Mechanics (rules and systems), Dynamics (runtime behavior), and Aesthetics (the emotional

responses a game evokes) [7]. The framework lists eight aesthetic categories, sensation, fantasy, and narrative among them, and argues that good game design starts from a target aesthetic and works backward to the mechanics that can produce it. Applied to enterprise gamification, MDA has recently been read as locating the main reservoir of unrealized design potential in that Aesthetics layer [8]. Most gamified information systems still reduce games to their mechanics, and in doing so leave untouched the layer most responsible for sustained engagement.

C. Aesthetic Experience in Information Systems

Aesthetic experience has become a construct in its own right within human-computer interaction. Suh and colleagues found that aesthetic experience with information systems, understood as beauty, emotional response, and meaningful engagement with the design, was associated with behavioral intention beyond usability and utility [8]. Schmidt and colleagues carried the line further, showing that gameful experience mediates the link between gamified competition and perceived innovation culture in the workplace [9]. The present study extends the same thread, observing aesthetic experience inside a gameful supervision system and within a population trained to read visual artifacts critically.

D. Game Art, Narrative Design, and Diegetic Interfaces

Scholars have paid growing attention to game art, the visual and narrative craft that gives a game its particular feel. Work on emotional attachment in character design shows that character art, voice, and narrative framing can produce empathetic responses well beyond simple identification with an avatar [12]. Visual novels and other narrative-driven games make an instructive case, since engagement there rests almost entirely on art, dialogue, and pacing, with character design carrying much of the affective load [12]. Possler and Klimmt, working from media psychology, argue that game aesthetics enable entertainment through cognitive-affective engagement with visual and narrative stimuli [10], and recent empirical work points the same way, finding that players weight aesthetic and sensory dimensions heavily when judging game experience [11]. In educational settings, Jafarkhani and colleagues single out visual style, narrative integration, and emotional resonance as the central factors shaping aesthetic experience in educational games [17], while studies of commercial gaming confirm that aesthetic design carries an independent influence on hedonic, utilitarian, and social motivations [18]. Diegetic interfaces, meaning UI elements that live inside the fictional world instead of floating above it, have been identified as a key technique for weaving game art into interaction design, and newer interaction-design work pushes further, asking how design metaphors align, or fail to align, with the metaphors users themselves reach for when describing an experience [19]. Relatively less attention has been paid to applying full game art as a primary experiential strategy in non-entertainment administrative or educational systems, and TAMAGO is an attempt in that direction.

E. Studio-Based Learning and Animation Pedagogy

Animation education is rooted in studio-based learning, a pedagogical tradition of iterative critique, production pipeline training, and narrative-led project development [20]. Years of that training leave students with a developed visual literacy and narrative sensibility, which makes them an unusually

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relevant, and unusually expert, audience for aesthetically rich interactive systems. The final project in an animation program is also not a written thesis in the usual sense; it is a produced animated work that unfolds over months and gathers artifacts of several kinds, including storyboards, animatics, rendered scenes, and final composites. Supervision tools built around text-based theses map awkwardly onto that workflow, and the mismatch is precisely the design opportunity TAMAGO tries to take. Recent work on gamification in Indonesian higher education [21] adds one more contextual note, since mixed-methods studies in this setting find that gamification succeeds or fails largely on its fit with disciplinary culture rather than on generic motivational mechanics [2].

III. METHODS

A. System Overview

TAMAGO is a web-based interactive prototype of a gameful thesis supervision system. A persistent sidebar carries the user between six major scenes: (a) a Journey Map that lays out the seven-stage thesis path, (b) an Active Chapter scene detailing the current production stage and its quest lists, (c) a Shrine Altar for progress submissions, framed as a ritual act rather than a file upload, (d) a Supervision Journal that keeps dialogue-style exchanges with the supervisor character, (e) a Character Sheet presenting RPG-style statistics (Creativity, Technical Skill, Discipline, Collaboration, Narrative Vision) on a radar chart, and (f) an Achievements gallery.

Three design properties set the prototype apart. Every background is an illustration at 1920 by 1080 resolution; the set includes a library at sunset, a studio at daylight, a shrine altar, an atelier, an archive room, and a campus at sunset. The supervisor and student appear as visual novel-style characters with emotional states (idle, happy, thinking, tired) and configurable gender. And the egg metaphor serves as the system's persistent visual anchor: the egg passes through six illustrated stages (intact, first crack, second crack, third crack, hatching, hatched) matched to the six production pipeline stages (Fig. 1). The Journey Map lays out seven thesis-path stages, whereas the egg abstracts the underlying production process into six transformation stages, so the two layers are related but not in one-to-one correspondence. Typography pairs a serif body face (Cormorant Garamond) with amber and sage accents, a deliberate departure from the blue-gray palette that dominates academic information systems.

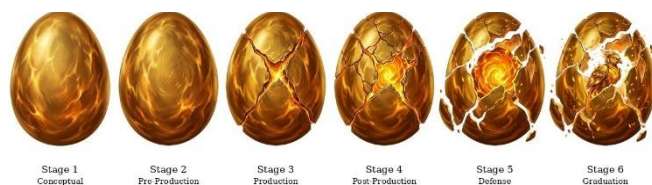


Fig. 1. The six stages of the egg-hatching metaphor, each tied to a stage of the animation production pipeline. The persistent visual anchor allows students to perceive their thesis progress as physical transformation rather than an abstract percentage.

The six painterly backgrounds make up the environmental palette of the system, and each maps to a functional area. The library hosts the journey map, the studio frames active production tasks, the atelier holds the supervision journal, the archive room houses the character sheet, the campus marks transitions, and the shrine altar (Fig. 6 below) receives progress submissions. Four representative backgrounds

appear in Fig. 2. Nothing about the painterly style or the warm chromatic register was accidental. An earlier critique by the design team had described the blue-gray palette of conventional academic systems as affectively cold, and the warm amber-sage palette grew out of that critique as a counterweight.

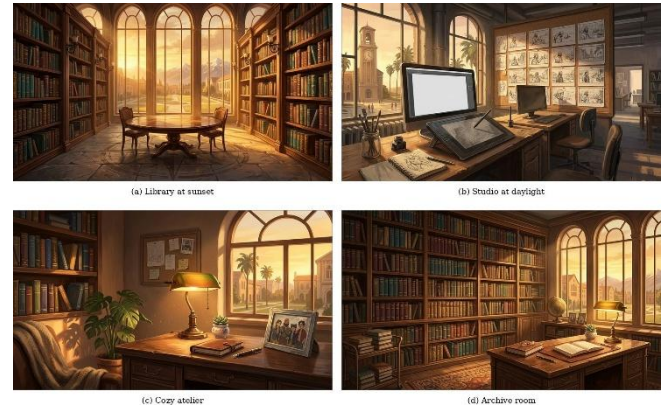


Fig. 2. Four representative background environments used in TAMAGO: (a) library at sunset, the primary navigation hub; (b) studio at daylight, evoking professional animation production; (c) cozy atelier, hosting the supervision journal; and (d) archive room, displaying the character sheet.

The student character comes in four emotional states (idle, happy, thinking, tired), which the system can invoke to mirror a user's reported condition at onboarding or at narrative checkpoints (Fig. 3). Across states the character keeps a stable visual identity in costume, hairstyle, and silhouette, while posture, facial expression, and micro-gesture change. The approach borrows a visual novel convention in which character art conveys emotional state without leaning on dialogue tags. Two gender-coded variants exist with matching animation and state coverage; only the female variant is shown here for space, though the male variant is structurally identical.



Fig. 3. Four emotional states of the student character (female variant shown; male variant structurally identical). State-based character art allows the system to reflect the user's reported condition visually rather than numerically, following a visual novel convention.

The supervisor is represented as a matching set of character designs (Fig. 4). Two gender-coded base variants are provided, and within each gender two distinct character designs let students select (or be assigned) a supervisor character that plausibly resembles their own. Across the four

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designs, poses range from standing-and-welcoming to seated-with-sketchbook, acknowledging the diversity of supervisor personalities in animation education. The design of the supervisor character carries particular weight in this system. As Section IV.A reports, this was the visual element that several participants cited as most emotionally affecting.



Female, design A Female, design B Male, design A Male, design B

Fig. 4. Four supervisor character designs in TAMAGO, spanning two gender-coded base variants with two personality-coded designs within each (poses and props differ). Participants select or are assigned the variant that most closely represents their actual supervisor.

B. Research Design

The design was a formative single-case evaluation with mixed methods, and it was not comparative: only the full game art variant of TAMAGO was evaluated, with no alternative-fidelity condition. The choice was deliberate, and a research positioning document accompanying the study records the reasoning. A single-case scope buys thick characterization of user experience in one institutional context at the cost of effect estimation across conditions, and the experimental comparison of visual fidelity levels is handled by a parallel investigation from the same research team, to be reported elsewhere.

C. Participants

Seventeen undergraduate animation students took part (10 women, 7 men; age $M = 22.2$ years, range 20 to 24). All were enrolled in the Animation Study Program at a state arts institute in Indonesia, with semester levels ranging from 5 to 10 (median 8). Three participants had not yet started their final project, thirteen were actively working on it across pre-production, production, and post-production stages, and one had defended within two weeks of the session. Gaming frequency varied: four participants played almost daily, seven weekly, five one to three times per month, and one did not play games. Recruitment was purposive through program announcements. Students under direct supervision of research team members were excluded to mitigate social desirability bias. Sessions were facilitated by two research assistants who were not members of the teaching faculty. During pre-screening and at the start of each session, participants were asked whether they had previously encountered TAMAGO in any form (demonstration, poster, prior study, or conversation with the design team). None reported prior exposure. This reduces, though does not eliminate, familiarity effects on the responses reported below.

D. Task Scenarios and Session Flow

Each session ran for 60 to 75 minutes in total. The core prototype interaction lasted approximately twelve minutes

(mean 11.9, range 10 to 14, SD 1.03), with the remaining time spent on consent, demographics, questionnaires, and the interview. During the prototype phase, participants worked through five scenarios: (1) onboarding and character profile selection; (2) exploration of the Journey Map and Active Chapter scenes; (3) a weekly progress submission through the Shrine Altar using a dummy file; (4) a visual-novel dialogue exchange with the supervisor character; and (5) reflection on the Character Sheet and achievements. Scenarios were designed to touch each design property (environments, characters, metaphor, and narrative and metaphorically framed interface elements) while mirroring realistic supervision tasks in the animation pipeline. The short interaction window supports the usability and first-impression focus of this formative study. It also limits what can be read from the Flow subscale score reported in Section IV.B, since Flow typically requires longer sustained engagement than the present design allows.

E. Instruments

Four quantitative instruments were administered after task completion. The System Usability Scale (SUS) provided the standard measure of perceived usability on a 0 to 100 scale [22]. A twenty-seven-item gameful experience inventory covered six dimensions (Enjoyment, Flow, Excitement, Autonomy, Creativity, Absence of Frustration) on seven-point Likert scales, drawn from prior work on gameful experience measurement [23]. The short User Experience Questionnaire (UEQ-S) gave eight semantic-differential items measuring Pragmatic Quality and Hedonic Quality [24]. A domain-specific nine-item scale measured Aesthetic Experience (six items) and Metaphor Perception (three items), with items developed from Suh and colleagues' aesthetic experience construct [8] and adapted for the supervision context. Intention to Use was measured with three items. All item orders within each scale were randomized. Gameful-experience items were interleaved across dimensions so that participants could not detect subscale grouping.

Qualitative data came from four open-ended prompts at session end (most impressive aspect; area for improvement; cultural or media association; anything else to convey) plus a short semi-structured interview that probed visual design, character representation, and metaphor interpretation. All sessions were audio-recorded with consent. Open-ended written responses were captured verbatim.

F. Analysis

Quantitative analysis ran in four steps. Descriptive statistics (mean, standard deviation, median) were computed per instrument and per subscale. Internal consistency was assessed using Cronbach's alpha. Given the small sample ($n = 17$) and ordinal Likert data, correlations were computed using Spearman's ρ rather than Pearson's r . Approximate 95% confidence intervals for ρ were obtained using the Fisher z transformation with the Bonett and Wright standard error for Spearman statistics [25]. Directional expectations drawn from prior literature, rather than formal hypotheses, guided interpretation: E1, SUS at or above 68 (the widely cited benchmark for acceptable usability [26]); E2, a hedonic-dominant profile of gameful experience given the visual-storytelling background of participants; E3, a positive correlation between Aesthetic Experience and Intention to Use. These are descriptive observations, not causal tests.

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One methodological caveat colors every quantitative finding below. All measures were self-reported and gathered in a single session immediately after task exposure, a design that opens the door to common method bias. Bias of that kind can inflate the observed associations among conceptually related self-report constructs, which here means aesthetic experience, hedonic quality, and intention to use. The correlations reported here are therefore best read as descriptive associations within one measurement context, not as unbiased estimates of the underlying relationships. Separating stable construct relationships from shared-method variance would take longitudinal and multi-method designs.

Qualitative analysis followed Braun and Clarke's reflexive thematic analysis, including the authors' more recent elaboration of the method [27], [28], [29], working through familiarization, initial coding, theme generation, theme review, theme definition, and reporting. Two researchers coded the open-ended responses and generated themes collaboratively, treating divergent readings as interpretive resources rather than as discrepancies to be reconciled. Themes were refined iteratively until no new themes emerged. Themes were refined iteratively through repeated, reflexive engagement with the data. Quotations are reported verbatim with minimal translation, preserving the original Indonesian phrasing where it carries nuance that English translation would flatten.

G. Ethics and Conflict of Interest

The research was conducted under institutional ethical clearance. All participants provided written informed consent, were told of their right to withdraw at any point without consequence, and received a small honorarium. A conflict-of-interest disclosure is warranted. The researchers are affiliated with the institution that hosts the target population. The mitigation strategy draws on recent design research practice on shared-affiliation studies [30]. Four concrete steps were applied. Recruitment excluded students under direct supervision of team members. Session facilitators were research assistants unknown to participants. Quantitative analysis was performed by a team member not involved in prototype design. All negative and critical participant quotations are reported verbatim rather than filtered. In addition, as noted in Section III.C, participants were screened for prior exposure to TAMAGO and none reported any. These steps reduce but do not eliminate the risk of social desirability bias, and the limitation is acknowledged in Section V.

IV. RESULTS AND DISCUSSIONS

Results are organized around the five research questions. Given the integrated format of the target journal, interpretation accompanies each result block rather than being deferred to a separate section. Quantitative findings come first, and qualitative themes that illuminate the patterns in the numbers follow.

A. Aesthetic Experience and Metaphor Perception (RQ3, RQ4)

The strongest quantitative signal in the study sits in the aesthetic and metaphorical layer of the system. Aesthetic Experience reached a mean of 6.33 (SD = 0.66, median = 6.5) on a seven-point scale, with Cronbach's $\alpha = .93$ indicating excellent internal consistency. Metaphor Perception reached 6.27 (SD = 0.88, median = 6.67, $\alpha = .96$). Both constructs

press against the ceiling of the response scale. Intention to Use, measured on the same seven-point scale, came in at 6.00 (SD = 0.96, median = 6.33, $\alpha = .93$).

TABLE I. DESCRIPTIVE STATISTICS FOR AESTHETIC EXPERIENCE, METAPHOR PERCEPTION, AND INTENTION TO USE (SEVEN-POINT SCALE, N = 17)

Construct	Items	Mean	SD	Median	α
Aesthetic Experience	6	6.33	0.66	6.50	.93
Metaphor Perception	3	6.27	0.88	6.67	.96
Intention to Use	3	6.00	0.96	6.33	.93

Spearman correlations ran in the direction expectation E3 anticipated. Aesthetic Experience correlated with Intention to Use at $\rho = .73$ (95% CI [.36, .90]), and Metaphor Perception showed an even stronger association, at $\rho = .83$ (95% CI [.56, .94]). The two constructs were also strongly associated with each other ($\rho = .74$, 95% CI [.38, .91]), which suggests that for this population they share a perceptual root. With $n = 17$ the confidence intervals are wide, as expected, so these values should be read as descriptive associations within one sample rather than precise effect estimates. Nor do they license causal inference about visual fidelity effects; that question sits, by design, outside the scope of this evaluation.

Why are these numbers so high? The thematic analysis of the open-ended responses offers part of the answer. The egg-hatching metaphor dominated, mentioned by fourteen of the seventeen participants, a finding in line with recent work arguing that metaphor operates as active design material in educational interfaces rather than as aesthetic ornament [19]. [1]. Two responses stood out. Participant P04, who had defended her thesis two weeks before the session, wrote: "the egg metaphor captured my thesis experience accurately. At first everything felt intact and frightening, then cracks appeared slowly, and at some point you know you cannot go back. TAMAGO really visualizes that process." Participant P07, a semester-9 student whose thesis had been delayed, reported: "when I first saw the egg illustration cracked a little, I actually cried a little. Seriously. I am in semester 9, my thesis is delayed by a semester, and I had almost forgotten that a slow process does not mean failure. The egg metaphor reminded me that I have already cracked toward hatching; I just have not arrived yet." For at least some participants, then, the metaphor operated as a mirror of lived experience rather than as decoration. Quieter versions of the same reading appeared elsewhere: P14 noted that "progress feels bodily rather than an abstract percentage," and P01 reported being "literally goosebumped" at the first crack illustration.

A second theme cast full game art as an affective counterweight to the look and feel of campus information systems. Participant P06 was blunt about it: "I usually feel stressed when opening campus applications because the UI is cold and makes me panic. TAMAGO makes me feel accompanied. The amber and sage palette is clever." P09, a non-thesis student, observed: "I did not expect a campus application could be made like this; it looks like a premium mobile game." The counterweight reading recurred across

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responses. Several participants described the prototype's painterly backgrounds, warm palette, and character-based dialogue as relief from the cold, administrative tone they associated with existing platforms. Fig. 5 shows the visual-novel dialogue scene that several interview responses singled out.



Fig. 5. A visual novel dialogue scene combining the painterly library background, character art for supervisor and student, and a stylized dialog frame addressing the student in conversational Indonesian. P17 reported being moved to laughter and tears upon seeing her own supervisor represented as such a character, saying it changed how she imagined the next meeting.

A third theme shows how the animation-student background functioned as critical literacy rather than naive appreciation. P15, a digital painting student, evaluated the system as a fellow artist: "each background is an artwork. As someone studying digital painting, I see the handling of light and composition. The Shrine Altar at sunset is symmetrically composed perfectly." P10, self-describing as an amateur interaction designer, praised the design voice while warning against commodification: "if this becomes a product, do not hand development to vendors that copy-paste SaaS templates. This needs an art director who understands narrative design." P16 endorsed the character-sheet approach from a game-design angle: "I play many management games and immediately connect with how TAMAGO shows progress. The radar chart Creativity/Discipline/Collaboration feels right." What these responses suggest is that a visually literate audience does more than accept aesthetically rich systems readily. It engages with them as craft, separating polished intention from decorative surface, and it reads aesthetic quality as a signal that the design is serious rather than merely ornamented [13], [8].

B. Gameful Experience Profile (RQ2)

The profile of gameful experience dimensions matched expectation E2. The descriptive profile was highest for Enjoyment and Creativity and lowest for Flow. This pattern is consistent with, but does not statistically establish, the expected hedonic emphasis.

TABLE II. DESCRIPTIVE STATISTICS FOR THE SIX GAMEFUL EXPERIENCE SUBSCALES (SEVEN-POINT SCALE, N = 17)

Subscale	Items	Mean	SD	Median	α
Enjoyment	5	6.13	0.96	6.00	.99
Creativity	4	6.01	0.82	6.25	.95
Excitement	5	5.82	0.93	6.00	.97

Subscale	Items	Mean	SD	Median	α
Autonomy	4	5.57	0.74	5.50	.91
Absence of Frustration	3	5.14	0.76	5.00	.97
Flow	6	4.80	0.98	4.83	.98

The moderate Flow score (4.80) needs careful reading. Flow depends on sustained engagement over time, clear progress toward a challenging goal, and an immersion deep enough to push external awareness aside. The prototype interaction here lasted roughly twelve minutes and centered on exploratory rather than goal-driven tasks. Flow does not typically emerge under those conditions, and recent reviews of Flow in gameful environments raise the same caution about short evaluation windows [31]. The short interaction window offers an alternative explanation for the moderate Flow score and limits how far the result can be interpreted. Whether Flow develops over longer use is a question for a longitudinal study of TAMAGO during actual thesis work. Recent systematic work on flow in gameful approaches supports the reading: flow tends to require interventions of substantial duration and matched challenge, conditions this short formative session never aimed to satisfy [32]. Experimental studies of flow in gamified educational environments add that the social structure of the activity, whether competition, collaboration, or solo work, is itself a meaningful moderator [33].

The high Creativity score (6.01) is striking given who the participants were. Open responses suggest they read the system itself as a creative artifact, and then as a prompt for their own creative thinking. P08, a visual-novel player since adolescence, reported: "the UI feels like an interactive visual novel. I connected immediately. The Cormorant font is nostalgic." P15 said that using the prototype left her "thinking about making a final project with a narrative method like this." For animation students, TAMAGO appears to double as a supervision tool and an inspiration source, a dual role that may be particular to creative education and worth closer attention in later work.

C. Usability and User Experience Quality (RQ1)

The mean SUS score of 74.4 (SD = 13.65, median = 72.5, $\alpha = .96$) places TAMAGO at grade B ("Good") on the Sauro-Lewis curved grading scale, above the commonly cited benchmark of 68 [26]. On the adjective rating scale proposed by Bangor and colleagues [34], five of the seventeen participants rated the system at the Excellent level, four at Good, and eight at OK. No participant rated it Poor or Awful; the lowest score was 52.5, and one participant (the post-defense student) rated it 100. Taken together, the distribution points to consistently acceptable usability alongside sizable individual variation in how demanding the interaction felt, a variation that fits the general observation that usability is a multi-attribute property subject to individual differences [35].

UEQ-S results reinforced the picture and added a nuance of their own. Pragmatic Quality reached a mean of 2.06 (SD = 0.60, $\alpha = .88$), inside the Excellent band of the UEQ benchmark [24]. Hedonic Quality reached 2.65 (SD = 0.42, $\alpha = .91$), also Excellent and noticeably higher than Pragmatic Quality. That ordering fits how the system was positioned: TAMAGO was built first for hedonic qualities (stimulation, novelty, beauty) while staying pragmatically adequate (easy,

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efficient, clear). Pragmatic Quality and SUS were strongly associated in this sample ($\rho = .95$, 95% CI [.86, .98]). The association is read as expected construct overlap, since both instruments measure closely related facets of usability; the two scales share too much conceptual territory for one to serve as independent evidence of convergent validity for the other. Given the small sample, this unusually high correlation should be read cautiously, primarily as evidence of substantial overlap in this measurement context rather than as a stable population relationship.

Qualitative responses surfaced specific usability frictions that the instruments captured only indirectly, and three of them recurred. P01 reported that "the flow between Journey scene and Chapter scene sometimes feels jumpy. Maybe a short transition or supervisor line could make it more narrative." P03 noted a mismatch between poetic menu names and generic icons: "sometimes the menu name is poetic ('Shrine Altar') but the icon is still generic. There were one or two moments I was confused which tab to tap." P15 described an initial navigation confusion that resolved within five minutes: "at first I was confused by the navigation. But after five minutes it was fine. Maybe a short narrator-style tutorial at the beginning would help." None of these frictions indicts the design philosophy. They are iteration targets.

D. Design Tensions and Critical Minority Views (RQ5)

Any single-case evaluation risks overweighting a consensus narrative and losing the minority voices that matter most for design. Three critical responses deserve discussion here, because each anticipates an issue a release version would have to face

P05 named a temperamental mismatch: "honestly, I am not the type who needs gamification for my thesis. I actually need a to-do list straight to the point. The 'game' feel is too thick at the front. Maybe there could be a toggle for a 'focus mode' that minimizes decorative elements." The signal is legitimate. When a gameful system assumes that every user wants gameful framing, it imposes aesthetic labor on people who just want to finish a task. A focus mode would answer the concern, not as an escape hatch from the system's identity but as a form of respect for user variance.

P12 raised the durability concern: "to me there are too many metaphors. 'Egg', 'Shrine Altar', 'Sensei' for supervisor. Nice for an entertainment product, but for an academic system used weekly, it feels over-designed. I am worried the sensation disappears after two or three months and only friction remains." The same participant asked for a three-month longitudinal study and put the worry sharply: "day-one wow factor is not the same as week-twelve comfort. I am skeptical the metaphors still feel meaningful by week ten." That worry echoes a well-documented issue in gamification research, the novelty effect [6], [31]. Fig. 6 shows the Shrine Altar scene that anchors weekly progress submission, the visual P12 partly had in mind when raising the over-design concern. It deserves plain statement: the high aesthetic and emotional responses observed here may partly reflect novelty rather than stable user experience qualities, and a cross-sectional design cannot pull first-impression enthusiasm apart from durable engagement. A longitudinal follow-up is therefore a priority for future work.



Fig. 6. The Shrine Altar scene that frames weekly progress submission as a ritual rather than a file upload. P15 (a digital painting student) singled out the composition as "symmetrically composed perfectly." P12, by contrast, treated such metaphor-heavy framing as an open question for longitudinal use.

P10 raised a transparency concern about the Character Sheet statistics: "the stats at the character sheet ('Creativity 88', 'Discipline 62'); I understand the intention, but the numbers feel arbitrary. How does the system calculate them? This is crucial because students take numbers labeled 'skill' seriously." The response points to a design responsibility that gameful educational systems carry and conventional information systems typically do not. Once a system attaches numerical labels to students' personal attributes, justifying those numbers becomes an accountability question rather than a design question alone. A firm recommendation is therefore warranted rather than mere acknowledgment of the concern. Any release version should make each statistic auditable, exposing the derivation of every attribute on demand and tracing it to the concrete activities or rubric inputs that produced it, so that a student can see why Creativity reads 88 rather than encountering it as a verdict. Where a transparent computation is not feasible, the system should not present numeric scores at all; it should replace them with an explicitly self-narrative framing, labeled as such in the interface, so the figures read as reflective prompts rather than assessment. Displaying unexplained numeric 'skill' scores to students is the one design choice to be advised against carrying into deployment.

Three further themes arrived as feature requests rather than critiques. P04 and P07, both nearing or past defense, asked for an "alumni mode" that would preserve read-only access after graduation. P09 and P15, both pre-thesis students, wanted a "preparation mode" that would let students engage with TAMAGO before formal thesis work began. P13, working on a collaborative project, asked for multi-character support: "we work on the thesis as a pair. Seeing the seven-chapter journey as a map lets us discuss 'which phase we are at now' with clearer language. But a feature for multi-person thesis is not yet present." Read together, the requests imagine TAMAGO as an extensible platform rather than a point tool.

E. Cultural and Media Anchoring

When asked what the system reminded them of, participants converged on a cultural anchoring that helps explain the responses above. They rarely reached for mainstream gamification tools like Duolingo or Habitica. What they named instead were narrative-driven games and film animation. Participants named Persona 5, Disco Elysium,

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Pentiment, Journey, Gris, Spiritfarer, Celeste, Ori and the Will of the Wisps, VA-11 Hall-A, Coffee Talk, and To the Moon. Studio Ghibli came up several times (Whisper of the Heart, Spirited Away, Howl's Moving Castle). Literary references included *Le Petit Prince* and *Secret of Kells*. One participant cited *Habitica* but qualified the comparison: "similar to *Habitica* but far more cinematic."

The anchoring matters because it places TAMAGO in a specific design lineage: the narrative-framed interactive system, not the productivity-game hybrid. It also raises the possibility, which the present data cannot directly test, that the audience most ready to adopt the system differs from the one gamification research has usually targeted. TAMAGO sits closer to indie narrative games than to educational PBL tools, and the fluency of the participant population in that space appears to drive the aesthetic appreciation captured in the quantitative results. In practical terms this calibrates the findings to a gaming-fluent, visually literate audience: students outside the arts, with less training in narrative and visual reading, may respond differently, and this remains an empirical question for comparative research; the figures reported here should therefore be read as specific to this population rather than as a baseline for other settings.

V. CONCLUSIONS

This paper reported a formative single-case evaluation of TAMAGO, a gameful thesis supervision system built around full game art aesthetics, visual novel dialogue, and an egg-hatching metaphor tied to animation production pipeline stages. Seventeen undergraduate animation students at a state arts institute in Indonesia worked through task-based sessions with the interactive prototype, then completed four quantitative measures, including three established instruments and an adapted domain-specific measure, and a semi-structured interview.

The five research questions can now be answered in turn. On usability (RQ1), TAMAGO achieved a mean SUS of 74.4 (Good) and UEQ-S Pragmatic Quality of 2.06 (Excellent), placing the system above widely cited benchmarks. On gameful experience (RQ2), a descriptively hedonic-leaning profile emerged, with Enjoyment (6.13), Creativity (6.01), and Excitement (5.82) leading, consistent with the design's aesthetic emphasis and the participants' creative background. On aesthetic experience (RQ3), the system scored 6.33 on a seven-point scale with a strong association to Intention to Use in this sample ($\rho = .73$, 95% CI [.36, .90]), read cautiously given the small sample. On the metaphor (RQ4), the egg-hatching visualization resonated across the sample ($M = 6.27$) and produced unusually affective responses, including reports of tears and goosebumps. On design implications (RQ5), three tensions surfaced as iteration targets: supporting users with low gameful-tolerance through an optional focus mode, testing longitudinal durability of narrative framing, and making Character Sheet statistics transparent and accountable.

What this paper contributes is a design case, not a generalizable finding. The paper shows full game art aesthetics deployed in an educational supervision system where, in this specific context, the observed usability did not appear to suffer under the aesthetic load. It documents the conditions under which the system drew high self-reported engagement, and is explicit that those conditions include a

target population with visual literacy and narrative fluency. And it brings empirical observations from an animation-education setting to the continuing discussion of aesthetic experience in gameful systems opened by Suh and colleagues [8] and continued by Schmidt and colleagues [9]. These are phenomena to describe rather than effects to prove. A final caveat concerns scalability. The full game art build evaluated here is asset-intensive: the prepared assets comprise six 1920 by 1080 background environments, multiple gender- and personality-coded supervisor and student character designs, and a six-stage egg illustration set. Departments without in-house art capacity, particularly outside the arts, would face substantial commissioning cost and lead time to reach comparable fidelity, so full game art is most realistic for programs that already hold or can absorb this production capability, while lighter variants such as a reduced asset set or procedurally recolored scenes offer a more scalable route elsewhere; whether those lighter variants preserve the effects reported here is exactly what the parallel visual-fidelity study is positioned to test.

Several limitations must be acknowledged. First, evaluation covered only the full game art variant; no alternative-fidelity comparison was conducted, and no causal claims about visual fidelity effects can be drawn from the present results. A parallel experimental study addresses that question. Second, the sample size ($n = 17$) was adequate for the formative usability scope of this case evaluation but limits statistical inference and transferability, as the wide confidence intervals reported for the correlations make clear. Third, all participants came from one animation study program, which limits transferability to programs with different disciplinary cultures; the high visual literacy of this population may not travel to contexts where students are less trained in narrative and visual reading. Fourth, a cross-sectional session with roughly twelve minutes of prototype interaction cannot capture novelty decay, so P12's concern about longitudinal durability stays open. Fifth, researchers and participants share an institutional affiliation. Mitigations were applied, but social desirability bias cannot be ruled out entirely. Sixth, the system's efficacy presumes supervisor participation in features such as dialogue-style feedback, and the supervisor side of the interaction went unevaluated. Seventh, the domain-specific Aesthetic Experience and Metaphor Perception scales were adapted from prior theoretical work rather than validated through confirmatory factor analysis, so their distinctiveness from related constructs such as UEQ hedonic quality cannot be assumed, and the high internal consistency coefficients ($\alpha = .93$ and $.96$) should be read with that caveat in view. Eighth, as Section III.F notes, every quantitative measure was self-reported and collected in one session, so common method bias may have inflated the observed correlations among conceptually related constructs.

Future work should take these limitations one by one. A longitudinal deployment across at least one semester would help pull first-impression enthusiasm apart from durable engagement. The comparative between-subject study of visual fidelity conditions, already underway, will isolate what full game art specifically contributes. Replication in other creative programs (design, fine arts, music, film) and in non-creative programs would map how far the findings travel. A supervisor-side evaluation would complete the interaction picture. Confirmatory factor analysis of the domain-specific

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scales on a larger independent sample would test their distinctiveness from hedonic quality and related measures. And a direct quantitative test of P12's novelty-effect concern, comparing week-one against week-twelve engagement, would show whether gameful systems built on narrative framing escape the decay pattern that typifies PBL gamification.

This paper closes with an observation rather than a prescription. In this sample, an aesthetically rich and narratively framed interface went together with higher self-reported intention to use and stronger emotional engagement in the supervision task. For students whose thesis journey is itself a work of art in progress, that pattern suggests aesthetics can be more than a pleasant add-on to an otherwise administrative tool. Whether the pattern holds outside animation education, and whether it survives prolonged use, are questions this study cannot settle. They are left open for the studies that will follow.

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