“I am lvl 8048, Madafaka” – Teacher and Students’ Technological Frames of Educational Gamification*

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Abstract

This case study investigates the implementation of gamification within a Scandinavian lower secondary education context, examining how teachers and students interpret and engage with a gamified learning management system designed to enhance student engagement and metacognitive skills. Utilising the Technological Frames analytical lens, the study examines the cognitive structures that influence stakeholder interactions with the gamified features. Data were collected through semi-structured interviews with 11 teachers and open-ended survey responses from 73 students, revealing key interpretive discrepancies between the two stakeholder groups. Teachers primarily viewed the gamified tool as motivating student learning. However, students’ responses varied widely, with some perceiving gamification as engaging, while others viewed it as irrelevant or counterproductive. The study identifies critical frames, including teachers’ "Operational Confusion" and students’ "Plaything" and "Killjoy" perspectives, which highlight a misalignment between cognitive frames. Findings suggest that successful implementation of gamification in education requires alignment of cognitive frames across stakeholders, supported by clear objectives, co-design, and culturally responsive design. The study concludes by offering recommendations for enhancing stakeholder engagement and optimising gamified learning systems.

Keywords

Gamification, Technological Frames, Stakeholder Perspectives, Educational Technology, Learning Management System, Student Perceptions, Secondary Education, Teacher Perceptions

1. Introduction

Gamification, the application of game elements in a non-game context [1], has gained widespread appeal in various educational environments [2–4], with educators and practitioners increasingly implementing game-like elements [5] - such as Points, Levels and Badges – to engage and motivate students [6, 7].

Adopting gamification in various educational contexts holds potential for fostering motivation and enhancing learning experiences [8, 9] . There are however also unexpected challenges that can arise when implementing gamification in learning contexts [10]. As several gamification design frameworks state, the successful implementation of gamification depends on the perception and expectations of its stakeholders [11].

In educational contexts previous case studies have shown that two vital stakeholders – students and teachers - shape how gamification is received and utilised in practice.

For instance, the teachers’ perspectives of gamification can play a crucial role in determining whether gamification is effectively adopted in the classroom or not. One case study followed the experiences of two upper-secondary teachers involved in the design, development and implementation of a gamified application for language learning and showed how their level of participation in the design process influenced their perception and respective endorsement of the

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gamified tool [12]. The analysis of teacher interviews and classroom observations revealed that one teacher who was actively involved in the gamification design developed familiarity and ownership over the tool, leading to more positive engagement [12]. In contrast, the second teacher, who had minimal involvement, felt disoriented by the application and ultimately ceased using it [12]. Other contextual factors, such as classroom dynamics, prior experience with gamification, and professional training, were also found to play a role in successful implementation [12].

Another comparative case study in upper secondary education identified factors affecting teachers' endorsement and adoption of gamified features in Learning Management Systems (LMS) [13]. These factors included teachers' sense of ownership, perceived relevance, student outcome concerns, and the alignment of educational gamification with pedagogical objectives [13]. The case study highlighted the importance of teachers clearly understanding the purpose and pedagogical value of gamification for successful adoption of gamification [13].

Another study, utilising a mixed-method investigation of 347 survey responses and 14 interviews, identified several factors influencing secondary school teachers' endorsement and affective intentions toward educational gamification[14]. The study revealed that teachers' attitudes, knowledge, and involvement in the design process of gamified learning tools significantly shape their acceptance and usage of these tools[14]. Moreover, the study underscored the importance of aligning gamification with pedagogical objectives and emphasised that teachers' understanding of the purpose and value of gamification is crucial for its successful implementation[14].

Moreover, it is not only the teachers' perception that matter but also how teachers' and students' perspectives align. A case study in which higher education students used a self-developed script within a gamified LMS, illustrates this [15]. Students saw their actions as a form of resistance and activism against what they perceived as unethical game design. In contrast, gamification designers viewed the behaviour as playful engagement and a demonstration of technological skill, while the university administration categorised it as cheating[15]. Such divergent interpretations suggest that the framing of different stakeholders in gamification can impact its role educational systems.

Aligned with these findings, previous studies have shown that the psychological effect of framing a learning activity as a game can affect how educational stakeholder engage and approach it [16]. An experimental study with third-year psychology students (n=90) demonstrates that merely framing a learning activity as a game - with game-like terminology and artefacts - holds nearly as much psychological potency as implementing full game mechanics in terms of students' intrinsic motivation [16]. Thus, when educational activities are presented as games, students' engagement, motivation, and interaction with the system may shift, as they bring a unique set of cognitive expectations. Creating alignment on the expected outcomes of educational gamification for teachers and students can however pose a challenge. For instance, a bibliometric analysis of 44 studies shows that discrepancies in defining gamification in educational contexts often arise from varied stakeholder perspectives [17]. The multiple definitions of gamification in the literature can hindered a cohesive understanding of gamification's role and impact in various settings [18] leading to confusion or misapplication among stakeholders. Furthermore, such a definitional ambiguity can complicate efforts to reliably evaluate gamification's effectiveness in education [19]. This concept is manifest in studies that show how framing influences interpretations of gamified systems: teachers and students may view gamified elements as pedagogical tools forms of entertainment, or even as extraneous features depending on the frame through which they perceive them [15].

To gain deeper insight into the perceptual alignments or misalignments that can arise when implementing gamification in educational contexts, the present case study explores the perspectives of teachers and students in a Scandinavian lower secondary institution and draws on *Technological Frames* (TF) [20] as an analytical lens to examine the cognitive frames through which the stakeholders interpret and interact with educational gamification. The following two research questions (RS) guided the study:

RQ1: How do lower secondary education teachers and students frame their experiences of a gamified learning management system?
RQ2: How do the cognitive frames differ between the two stakeholder groups?

2. Theoretical framework

TF were introduced in the 1990s to elucidate how individuals interpret and engage with information technology within organisational contexts [20]. TF is defined as cognitive structures - *frames* - held by organisational members shaped by their assumptions, expectations, and experiences[21]. These frames provide a foundation for understanding and assigning meaning to novel technologies, facilitating problem-solving and reducing ambiguity within the organisational environment. Within organisations, TF are often shared across groups, forming a joint interpretive basis among stakeholders. While frames vary slightly between individuals, they typically exhibit consistency within groups, enabling aligned technological perspectives. Although TF is inherently cognitive and personal, it can also represent broader organisational mindsets, albeit as approximations [22].

A TF analysis provides a framework to understand interpret, and interact with new technologies and emphasises possible misalignments hindering successful endorsement [20]. By examining stakeholders' cognitive framing - comprising their beliefs, assumptions, and expectations - organisations can anticipate and address resistance, disengagement, or misinterpretation[22, 23]. Insights gained from a TF analysis can inform strategic decisions around designing, communicating, and deploying similar technologies in comparable contexts, aligning initiatives with stakeholder expectations to facilitate smoother adoption and effective use [20]. This approach also reveals how prior interactions with technology shape stakeholders' interpretations, responses, and potential resistance. Given the high failure rates and resource demands of IT projects[24, 25], frequently due to perceived threats or potential loss of influence among organisational stakeholders[26–28], makes TF analysis is particularly valuable for identifying enablers and barriers to the approval of digital innovations, such as gamified learning technology.

In educational contexts, for instance, TF analysis can identify discrepancies between teacher and student frames regarding new learning tools, enabling adjustments that foster a shared understanding and improve outcomes.

Within the basic TF framework three core dimensions occur: *Nature of Technology, Technology-in-Use,* and *Technology Strategy* [2]. *Nature of Technology* reflects individuals' fundamental understanding of technology, encompassing its current functions and potential applications. *Technology-in-Use* involves assumptions about the technology's practical application, often influenced by users' past experiences. *Technology Strategy* addresses the strategic objectives tied to the technology, which can either enable or limit its use depending on existing practices. Although subcategories may vary by context [22, 23], these three dimensions is the analytical foundation of TF.

3. Methodology

The present case study explores the perspectives of two key stakeholder groups - teachers and students - on a gamification initiative within a Scandinavian lower secondary education institution. The TF framework was used as an analytical lens to understand the stakeholders' perceptions and interaction with the gamified LMS and to investigate their assumptions, beliefs, and expectations. Specifically, the study investigates how the stakeholder groups' framing of the gamified learning technology shaped their understanding, contributed to any interpretative incongruences, and, arguably, influenced the outcomes of the educational gamification implementation.

3.1. Materials

The case study investigates the implementation of gamification within a custom-built LMS across multiple schools within a secondary educational institution. Besides disseminating course information, accessing educational materials, and managing schedules, the LMS was designed to foster students' metacognitive skills, self-regulated learning and -leadership. To achieve this, the LMS included features enabling students to plan and document their educational activities, reflect on their understanding, and evaluate their learning process. However, students underutilised these functionalities, instigating the gamification initiative covered herein.

The initiative was funded by the secondary education institution and conducted in collaboration with a gamification provider. It was initiated through a design workshop that included management representatives from the institution and one gamification designer. The workshop focused on identifying conditions that the gamification implementation should address. Following the workshop, the provider recommended a gamification design later implemented in the LMS. This design aimed to enhance student interaction with the LMS's underutilised features by stimulating certain student behaviours.

To assess the impact of gamification, the gamification features were deployed in a subset of schools (n=3) during a post-launch monitoring phase. The post-launch monitoring phase is a part of the gamification design process were designers track, evaluate and calibrate the initial gamification design to better align with the project goals [29]. The central game elements integrated in the LMS was Points, Level, Avatar, Skills and Milestones (Figure 1). The core loop was designed to reward students with Points for engaging with specific features, such as completing tasks, writing self-reflections, and planning assignment submissions. The number of Points awarded varied depending on the significance of the LMS feature in promoting students' learning behaviours and the effort required for completion. Accumulated Points contributed to the student's progress in either Levels or Milestones; the latter was comparable to Badges/Achievements but with an educational focus. Milestones consisted of four achievable tiers, while Levels had no predefined upper limit (cap).

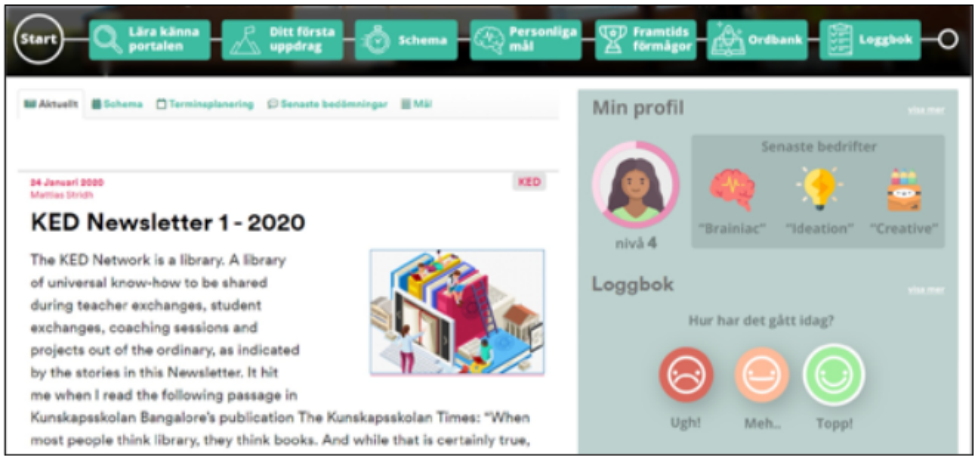

Figure 1: Screenshot of the student interface in the LMS displaying the Level (Nivå) along with the associated Progress Bar, Avatar and Milestone (Bedrifter)

The gamification design features were integrated into the LMS over the summer, with their release planned as part of an update in the first week of September. However, due to miscommunication among key educational stakeholders - including the LMS provider, institutional administrators, gamification designers, ICT educators, and teaching staff-critical information meetings addressing the implementation's purpose, rationale, and timeline were not coordinated. As a result, both teachers and students encountered the new features as they unexpectedly appeared in the LMS - which potentially contributed to the situation covered in the present study.

In the present study, data from the respondents were collected at the three schools during the post-launch monitoring phase over an approximately two-week period. The data collection consisted of semi-structured interviews with 11 teachers and survey responses from 73 lower secondary students. The gamification elements had been active in the LMS for around 10 days prior to data collection.

The teacher interview guide covered technical and operational dimensions, along with pedagogical and organisational aspects of the project. It addressed various interconnected topics, including their perception of the state of the digital learning environment; their prior knowledge of gamification; the project communication; the support structures; their understanding of the project objectives; the project's impact on their workload, and their current attitudes toward the gamification implementation. The gender distribution among the interviewed teachers was: 53.85% female and 46.15% male, all with over 8 years of professional experience.

The online student survey evaluated students' perception of the LMS and the individual gamification elements and their presentation within the LMS. In the present study the students' responses to five open ended questions in the survey were included in the analysis relating to what they liked and disliked about the LMS and how they perceived the different game elements.

The demographic distribution among the students in the survey was as follows: 6.76% identified as non-binary, 52.7% identified as female, and 32.43% identified as male. Additionally, 8.11% preferred not to disclose their gender. The students' ages ranged from 14 to 16, with the majority (71.7%) being 15 years old.

3.2. Methods

This case study employs a *point-in-time snapshot* approach[23], capturing stakeholders frames at a specific moment in time, approximately three weeks after implementation, to provide a detailed view of their interpretations in response to the gamified LMS. The TF approach explored how the individuals made sense of, assigned meaning to, and reacted towards the newly implemented technology[23]. The *point-in-time snapshot* approach provided a vibrant and dynamic research environment that illuminated the stakeholder groups perceptions during an early yet fundamental phase of gamification implementation.

The 11 teacher interviews (originally 12, with one omitted due to recording issues) were conducted via Zoom by authors 2 and 3, lasting between 45 and 55 minutes each. Authors 1-3 transcribed the interviews verbatim immediately after each session. The student survey consisted of 25 questions in total, including four demographic questions, 16 close ended-questions and five open-ended questions. The students were given time during class to respond to the survey. A deductive approach was adopted to analyse the data[30], using the dimensions *Nature of Technology, Technology-in-Use,* and *Technology Strategy* [20]. These dimensions provided a structured framework for the process, enabling a comparative analysis of both shared and divergent frames across stakeholder groups. The data analysis followed three phases of thematic analysis[31], applied concurrently to both interview transcripts and survey responses.

In Phase One, Authors 2 and 3 conducted an initial reading of both interview transcripts and survey responses to develop a thorough familiarisation with the content. During this phase, they performed a two-step open coding process: initial coding followed by focused coding. This approach provided a comprehensive view across both data sources, supporting the identification of preliminary themes.

Phase Two involved an iterative review by Authors 1-3, focusing on recurring concepts, words, and phrases within both the interview and survey data. Labels were applied to data segments across sources, capturing core ideas related to topics such as the role of gamification in education and developments within the learning environment. This ongoing, comparative coding process allowed for the continuous refinement of codes as the analysis progressed.

In Phase Three, theme refinement was conducted using the TF lens to evaluate and enhance coherence and distinctiveness across topics[31] in both datasets. This iterative review ensured that

each theme accurately represented insights from both teachers and students, grounded in the underlying data.

Finally, we mapped both teacher and student frames to provide a structured interpretation of the responses through a qualitative comparative analysis (QCA) [32]. This alignment ensured that the frames reflected recurring patterns relevant to the research objectives. Through this comparative analysis of stakeholders' TFs regarding educational gamification, we gained an in-depth understanding by situating their frames within a defined timeframe and setting, ensuring that our findings were relevant to the study's aims and accurately represented respondents' experiences and perspectives.

4. Results

The analysis of the teachers' and students' responses were organized into the three overarching TF-categories with related frames for the teachers and students respectively. Table 1. provides and overview of these frames (addressing RQ1) together with the relational dynamics that convey how the frames align and misalign (addressing RQ2).

4.1. Nature of gamified technology

A shared frame among teachers regarding the nature of gamified learning technology was that of an *Engagement Catalyst* - a pedagogical tool intended to intensify student motivation, foster constructive academic habits, and support students in reaching their learning goals. Teachers anticipated that the gamified elements would make learning activities more engaging and rewarding for their students. As T11 stated, "*the purpose is to provide continuous positive feedback and reinforcement by constantly feeling that you're achieving small goals and want to keep progressing. It's a way to increase motivation—to achieve the goals you set for yourself and to make it clearer that you're reaching those goals when you receive a badge for it*". T9 said, "*I interpret it as something meant to serve as a carrot for the students. That they sort of level up and all. That's what I think. That it's what drives them forward. […] a bit like 'I need to reach the next level,' something like that.". T3 held a similar notion: "I assume it is meant to motivate students who find regular school-work boring, to make it fun. That this (gamification) would help them to get engaged.*" Although using distinct semantics, the teachers framed the gamified technology as a motor for student engagement, envisioning it as a tool to drive motivation and active participation in the learning environment.

In contrast to the teachers' perceptions, student responses indicated a more complex relationship with the nature of the gamified technology. In the *Utility Perceptions* frame, some students found gamification appealing, stating, *"I think it's fun to compare levels with my friends, and it makes me want to do more tasks"* (S18) or *"I like it; it's like a to-do list that you can check"* (S20). Others were neutral, expressing opinions like, *"It doesn't affect me much*" (S24) or *"It doesn't make any difference to me"* (S29). Meanwhile, some students viewed gamification negatively, describing it as stressful due to perceived peer competition or as unnecessary. For example, one student noted, *"It just makes it more stressful, especially when others keep comparing their levels"* (S32), and another affirmed, *"Pretty unnecessary, to be completely honest"* (S7).

The student responses reveal a spectrum of reactions: some students found gamification motivating and enjoy comparing Levels or using it as a task-tracking instrument. However, a portion of students expressed either neutral or negative views, perceiving gamification as ineffective, unnecessary, or even stressful, mainly due to competition among peers.

The teachers' *Engagement Catalyst* frame and the students' *Utility Perceptions* indicate a vague relationship between teacher and student definitions and early experiences of gamification. However, another frame, *Cultural Disconnect*, emerged as students perceived the gamification implementation as disconnected, often viewing it as adults attempting to intrude on gaming culture. For instance, one student remarked, *"When I see it, I think of a bald, middle-aged man with grid glasses trying to be cool among young people"* (S13), while another described it as *"a stupid*

attempt by adults to understand us 'young people'" (S39). These comments reflect a perception of gamification as an awkward, inauthentic effort to adopt gaming culture, revealing an initial misalignment between the educational environment's intent and students' cultural expectations. This highlights a view of educational gamification as misaligned with students' authentic gaming experiences, shaping their understanding of its purpose and utility.

Table 1
Categories, Frames and relational dynamics for how teachers and students perceived the gamified technology

Category	Teacher frames	Student Frames	Relational Dynamics
Nature of Gamified Technology	Engagement Catalyst	Utility Perceptions, Cultural Disconnect	Some relationships between teacher (Engagement Catalyst) and student frames (Utility Perceptions). However, there is a disjoint between the teacher (Engagement Catalyst) and student (Cultural Disconnect) frames.
Gamified Technology in Use	Operational Confusion, Expectation Outcome Gap	Plaything, Killjoy, Engaging	A misalignment between teacher frames (Operational Confusion & Expectation-Outcome Gap) might have influenced unintended student behaviour and actual interactions with the gamification implementation (Plaything), affecting other student's perceptions of it (Killjoy).
Gamified Technology Strategy	Alignment Gap, Pedagogical Doubt	Ambiguous Purpose	Teachers noting under-informed about how gamification is intended to function (Alignment Gap) contributes to their uncertainty about its implementation (Pedagogical Doubt), which could have undermined the effectiveness of gamification. The teacher orientation may have contributed to fragmented student understanding of the purposes of gamification, its alignment with educational objectives, and its intended benefits (Ambiguous Purpose).

4.2. Gamified technology-in-use

One teacher framing of educational gamification implementation was *Operational Confusion*, which complicated the integration of gamified elements into daily learning activities. As one teacher expressed, *"There is quite a lot of information I'm missing. I still feel like I don't really know how all the features' function. Like, how many points students get for completing assignments, or if there are bonus points, or any loot somewhere. If so, can the students upgrade the loot, or? What is going on*

here?" (T4). Another teacher noted, *"The information could have been better[...]We should have been involved earlier; then I could have said what I'm telling you now. If you had included me from the start, I could have explained how these kids think, we could have avoided some pitfalls and prepared the students in a different way"* (T5).

These statements reflect teachers' concerns regarding the practical aspects of the system and underscore the importance of involving educators early in the planning stages. The lack of clarity surrounding operational details - such as Point allocation, bonus features, and potential rewards or "loot" - reveals an incomplete understanding of how the gamification elements function in practice. Within this frame, teachers conveyed that their limited insight and lack of ownership regarding the gamified learning tool hinder its smooth integration into the educational environment. The frame underscores the stakeholder groups' belief that adequate teacher involvement would contribute to a forthright and fruitful gamification implementation in day-to-day teaching practices.

Another framing that emerged among teachers was the *Expectation-Outcome Gap*, reflecting a disconnect between teacher expectations and student practices regarding the gamification initiative. Teachers anticipated that gamification would enhance motivation and provide structure, especially for less engaged students. However, in practice, student behaviours often diverged from these expectations, leading to frustration among educators. T8 observed, *"They've all figured out that they can level up like crazy without doing anything. That's what it is; a competition to see who can cheat their way to the most points."* Similarly, T3 noted, *"Students who were lazy and didn't bother about school much, about 50%, still do nothing; they don't care at all. The other half find it extremely enjoyable and amusing to exploit and find ways to trick the system. They only focus on ways to game the system, level up as quickly as possible, or fill the progress bars as fast as they can. This shifts their attention to the wrong things."*

These observations suggest that students often engaged with gamified elements in ways that deviated from the intended motivational goals, focusing instead on system mechanics and competitive Point-gathering rather than educational outcomes. T7 further illustrated this divergence: "*Students who were already performing well and keeping up with their studies have continued to do so, just as well as before. Meanwhile, those who previously have been challenging to inspire, whom we have struggled to engage, have started misbehaving and fooling around with the gamification. Instead of doing what they should, they sit and click on random nonsense."*

The statements from T3, T7, and T8 underscore a misalignment between teacher expectations for gamification as a motivational learning tool and students' actual interactions with the system. Rather than fostering academic engagement, teachers regarded the gamified elements as opportunities for unnecessary interaction, detracting from the intended educational purpose. This gap between teacher expectations and student behaviour suggests that gamification may not consistently achieve its intended motivational outcomes.

Students framed the use of gamified features as either *Engaging*, *Playthings*, or *Killjoys*. Some students viewed the features positively in the *Engaging* frame, finding motivation in tracking their progress and comparing achievements with peers. For example, S18 stated, *"It's fun to compare with my friends; it makes me want to do more assignments and level up,"* Student 24 commented, *"It's good because then I can see how much I've done."* Similarly, Student 59 noted, *"It's nice since you can perceive which tasks you've almost achieved and which ones you've already achieved."* These statements suggest that some students found the gamified elements engaging and motivating, particularly as tools for tracking progress and boosting productivity.

In contrast, a *Plaything* frame emerged among other students, who viewed the gamified features as recreational tools rather than mechanisms for supporting educational engagement. This perspective is evidenced by behaviours focused on gaining Levels and accumulating Points, often without substantive interaction with assignments. Statements like, "I am lvl 8048, Madafaka" (S62) and "I CAN DOMINATE MY CLASSMATES WITH MY SUPERIOR LEVEL!!!" (S70) illustrate how some students saw gamification as a competitive plaything, prioritising status within the system over educational engagement. In this frame, competition and system manipulation precede educational goals, discouraging authentic engagement. This framing indicates a disconnect

between the intended educational purpose of the gamified elements and students' actual use, where attaining high Levels overshadowed learning.

The behaviours exhibited within the *Plaything Frame* appear to have influenced other students' perceptions of the gamification system, giving rise to what can be described as a *Killjoy Frame*. This frame made some students disengage from the gamification elements and distrust their educational purpose. Comments like, *"My friends cheat"* (S15), *"Everyone cheats anyway, so it doesn't matter"* (S17), and *"Well, it's super easy to level up by cheating; we even have people at level 2000, so I don't really see the point in it anymore"* (S45) reflect this perspective, suggesting that some students came to view the gamified elements as meaningless. Within this *Killjoy Frame*, students perceived gamification features as pointless unless they, too, chose to manipulate them. This perception eroded the intended educational objectives of the gamified elements, shifting motivation away from authentic engagement and toward superficial or competitive interactions with the system.

The frames in the *Gamified Technology-in-Use* reveal how relational misalignments between the design, implementation, and use of gamified features shaped divergent stakeholder experiences. Teachers' unmet expectations and students' unintended interactions contributed to an overall environment where the gamification initiative struggled to achieve its objectives.

4.3. Gamified technology strategy

Teacher interviews revealed a frame, *Alignment Gap*, highlighting the lack of a clear strategy and rationale behind the gamification initiative. Teachers reported feeling insufficiently informed about the initiative's goals, which hindered their ability to communicate its purpose to students effectively. They expressed needing better alignment between the intended outcomes of the gamification implementation in the learning environment. T2 noted, *"I believe gamification is the right approach, but it needs to be implemented better, involving the students so they understand the purpose. They're not oblivious to what's happening but would benefit from an introduction to what's 'going on'."* T1 also remarked, *"We're supposed to implement something like this to develop our schools, but I don't think we're there yet. Me, and most other teachers, would like to run projects that we understand. […] I barely know what to tell the students about this, its purpose, etc. I haven't given my students a clear explanation. I don't think they know what this indicates; that might be why it's become a toy for many of them."* These statements illustrate a lack of strategic alignment in the gamification implementation within the learning environment. While teachers acknowledged some potential operational benefits, they indicated that gaps in communication and planning hindered their ability to integrate gamified features effectively into their teaching practices. The underlying issue appears to be that teachers received limited information regarding the purpose and practical application of the initiative, leaving them uncertain about how to support students in understanding its educational objectives. This lack of clarity seems to have created an environment in which the educational outcomes of the initiative remained ambiguous, highlighting teachers' concerns about the disconnect between gamification's strategic goals and its practical application in the learning environment.

Another frame, *Pedagogical Doubt*, emerged as some teachers questioned the educational foundation of gamification. T10 discussed its impact on student learning: "*Students don't understand the abilities they're practicing or what 'Goal Seeker' means […] They simply don't grasp what it entails or what competencies they're developing and improving."* Similarly, T6 voiced*: "We're trying to build a system that's supposed to solve something—a kind of ad hoc solution to a larger issue. Gamification is intended to motivate students, but is gamification really what we need to achieve motivation? […] The question is whether they're responding with the right motivation." Both teachers expressed doubts about the didactical approach to gamification and questioned whether it could effectively complement or replace traditional teaching methods.*

These statements imply that teachers view gamification as potentially lacking a didactical foundation, leaving them uncertain about its effectiveness in supporting or enhancing traditional

teaching methods. Their doubts about gamification's instructional value underscore hesitations to rely on it as either a replacement for or complement conventional approaches.

Both teachers expressed doubts about the didactical approach to gamification and questioned whether it could effectively complement or replace traditional teaching methods. These statements imply that teachers view gamification as potentially lacking a didactical foundation, leaving them uncertain about its effectiveness in supporting or enhancing traditional teaching methods. Their doubts about gamification's instructional value underscore their hesitation to rely on it as either a replacement for or complement to conventional approaches.

Students' revealed an ambiguity regarding the purpose of the gamification elements, particularly the Milestones. For example, *"I don't understand how the milestones assist me; I just know that I have to reach them"*(S12). S12 reflects an awareness of the Milestones' essentials while indicating confusion about their broader purpose. Similarly, S19 remarked, *"Skills are new, and we haven't really talked about them; I think I understand how they work, but I don't really care if I complete them"* (S19).

Although S19 indicates an awareness of the mechanics, they lack a sense of relevance or motivation to achieve them, highlighting a disconnect between the gamification elements and students' personal learning goals.

These statements suggest that students need to comprehend the intent behind implementing gamification, mainly how it is intended to support learning outcomes. While some students understood the mechanics, the lack of perceived relevance or alignment with their personal goals diminished their engagement. This points to a gap in the gamification strategy, as elements like Skills and Milestones had not been integrated into a pattern that resonates with or inspires students. The unclear purpose of gamification seems to contribute to reduced engagement and perceived value among them.

5. Discussion

The findings of this study reveal the misalignments between teachers' and students' technological frames, underscoring how divergent interpretations of gamified educational tools influence their perception of gamification in the classroom. Using TF as a theoretical lens [20], we observe how stakeholders' cognitive frames shape their engagement with and perception of gamification, echoing insights from related studies.

Teachers framed the nature of the gamified technology as *Engagement Catalysts* that facilitates student motivation and engagement in learning tasks. This aligns with previous research emphasising that educators often view gamification as a motivational enhancement to traditional instruction, expecting it to support student-driven learning and increase engagement[12, 13].

However, the *Utility Perceptions* frame indicates a disparity in student perceptions, with responses ranging from enthusiasm to indifference or even opposition. One reason for the discrepancy in students view of gamification could be due to the *Cultural Disconnect* experienced among students. This could for example be a result of the gamification implementation including a lack of more complex game mechanics and reward systems that can traditionally be found in games. Comparable results in prior studies suggest that students may not consistently view gamified elements as intended learning aids [33]. Such misalignment suggests that while teachers see gamification as an inherently positive force, students' varying degrees of approval may require more nuanced and culturally responsive design strategies. The *Operational Confusion* among teachers, marked by unclear implementation guidelines, resonates with previous findings [14], where teachers' lack of involvement in gamification planning hindered effective integration. Teachers in this study expressed concerns over insufficient support and training in using the gamified system, reflecting a gap in the operational alignment needed for successful classroom use. The *Expectation-Outcome Gap* further underscores the discrepancy between teachers' motivational expectations and students' actual use patterns, with some students exploiting the gamified system for competitive purposes rather than for learning. This divergence is consistent with research

showing that when gamified systems lack explicit alignment with learning goals, students often repurpose them for play rather than academic achievement[15, 16].

A frame that emerged from teachers' perspectives is the *Alignment Gap*, where the lack of clear objectives for the gamification initiative impeded teachers' ability to communicate its purpose to students. This finding corresponds previous arguments[18] who contend that a cohesive strategy is essential to ensure gamification aligns with educational objectives. Furthermore, teachers' *Pedagogical Doubt* about the educational foundations of gamification highlights concerns about its long-term efficacy as a teaching tool, a perspective also observed in the related work [19]. Teachers questioned whether gamified elements can truly foster deep learning, indicating a need for more evidence-based insights into the pedagogical benefits of gamification. One reason for the *Alignment Gap* and *Pedagogical Doubt* arising in the present study could be due to the teacher's lacking information before gamification was presented in the LMS – highlighting the need for creating higher alignment with the teachers before going live.

Among students, a framing of gamified elements as *Playthings* was prominent, where some students engaged with the system more for competitive or social reasons than academic motivation. The *Plaything* frame was connected to the *Killjoy Frame* where some students disengaged due to perceptions of cheating or competitive manipulation by peers, viewing the gamified elements as distractions.

5.1. Implications and recommendations

This study highlights the need for greater alignment of technological frames among stakeholders to ensure gamified tools meet their educational potential. Key recommendations include:

Ensuring teachers and students understand the educational objectives behind gamification could address the *Alignment Gap* and prevent students from viewing these elements merely as competitive or distracting. When gamification's purpose is communicated clearly, teachers can align their instructional strategies to reinforce these goals, and students are more likely to view the tools as supportive of their academic progress.

Involving teachers and students in co-designing gamified systems could further mitigate the *Alignment Gap* and ensure that both groups share a mutual understanding of the tool's purpose. Co-design could foster a sense of ownership and alignment, helping bridge stakeholder expectations gaps. Furthermore, by involving students the *Cultural Disconnect* that can arise could be mitigated.

Providing teachers with more structured guidance and professional development opportunities could reduce *Operational Confusion* and support more effective integration of gamified elements into their pedagogy. Such training should also emphasise the educational purpose behind gamification, ensuring that teachers are equipped to convey this to students effectively.

Recognising students' *Plaything* and *Killjoy* frames imply the importance of designing gamified systems that resonate with students' gaming culture while avoiding designs that may appear inauthentic or contrived. Culturally sensitive design approaches could prevent students from perceiving gamification as an unrelatable or superficial addition to their educational environment.

This study reaffirms that a misalignment in technological frames between educators and students can lead to conflicting interpretations and uses of gamified educational tools. Addressing these frame discrepancies through clearly defined objectives, co-design, training, and culturally sensitive design could enhance stakeholder alignment, thereby increasing the educational effectiveness of gamification initiatives.

5.2. Limitations and future research

This study has several limitations that should be considered when interpreting its findings. Firstly, as a single case study conducted within a specific Scandinavian lower secondary educational context, the findings may have limited generalisability to other educational settings or age groups. Differences in cultural, institutional, and educational practices across regions may affect the

applicability of our conclusions to other environments. Future studies across diverse educational contexts could enhance the external validity of these findings.

Secondly, while the point-in-time snapshot approach offers valuable insights into initial reactions to educational gamification, it does not capture the longitudinal effects of gamified learning tools in the learning environment. Stakeholder perceptions may evolve, particularly as teachers and students gain familiarity with the gamified elements [see 29]. Longitudinal studies tracking changes in stakeholder perspectives over extended periods could provide a more comprehensive view of gamification's sustained impact in educational settings.

Thirdly, data collection methods focused primarily on self-reported perceptions through interviews and surveys, which individual biases and social desirability effects may influence. Due to perceived expectations, teachers and students might underreport challenges or overstate positive experiences - or vice versa. Incorporating additional observational, performance-based measures, analytics, or artefact analysis approaches could yield a more nuanced understanding of actual interactions with gamified tools.

Finally, while effective for revealing cognitive structures and interpretative alignments, this study's reliance on the TF theory may limit the scope of analysis to stakeholder perceptions without fully addressing other potentially influential factors, such as technological usability or instructional design quality. Future research might consider integrating complementary frameworks, such as the Technology Acceptance Model [35] or Activity Theory [36], to expand on how technical and pedagogical factors interact with cognitive frames in shaping gamification outcomes.

Despite these limitations, this study provides insights into the interpretive challenges and alignment needs associated with gamification in educational contexts, contributing to a foundation for future research and practical applications.

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