‘Gamification was not the problem’

A case study exploring factors affect teachers approvement of gamification

Adam, A.P, Palmquist

Dept. of Applied IT University of Gothenburg, Gothenburg, Sweden

adam.palmquist@ait.gu.com

ABSTRACT

This case study concerns two schools using a similar gamification design in identical learning management systems. The two implementations produced different outcomes despite similar teacher and student demographics, learning methodologies, and learning context. Semi-structured interviews with ten participants involved in the projects were conducted, followed by thematic analysis. The case analyses identify vital factors affecting gamification implementations in a learning environment. Also, the study identifies the teachers as imperative for gamification practitioners to recognize as they may facilitate gamification implementation in the learning environment. The findings challenge previous studies on gamification acceptance in learning environments that describe gamification as a unanimous instrument, which disregards fundamental didactical and contextual factors.

CCS CONCEPTS

• **Applied computing** → Education; Learning management systems; Education; E-learning; • **Human-centered computing** → Human computer interaction (HCI); Empirical studies in HCI.

KEYWORDS

Gamification, Learning Management System, Education, Learning, Adoption, Student, Teacher, Teaching material, Implementation, Acceptance, Stakeholder

ACM Reference Format:

Adam, A.P, Palmquist. 2021. ‘Gamification was not the problem’: A case study exploring factors affect teachers approvement of gamification. In *Academic Mindtrek 2021 (Mindtrek ’21)*, June 01–03, 2021, Tampere/Virtual, Finland. ACM, New York, NY, USA, 11 pages. <https://doi.org/10.1145/3464327.3464347>

1 INTRODUCTION

Researchers have been interested in gamification in learning in recent years. Studies have argued that gamification can encourage student behaviour and engagement by appropriating designs affiliated with games in non-game settings [1]. Though gamification research is extensive in the education and learning field [2], several unexplored areas exist, such’s as learner demographics, learning

environments [3], as well as other contextual factors affecting the outcome of gamified solutions [4].

This case study aims to provide insights on factors affecting the outcome of gamification projects by interviewing teachers and gamification designers/developers. This case study investigates two upper secondary education schools - one with a vocational focus and the other with a higher education preparatory focus - gamification projects during the first semester of 2019. The two schools displayed highly different implementation outcomes, both direct and indirect. The school with vocational focus stayed through the study with vast teachers’ (See further [5]) and students’ participation (See further [6]). The school with higher education preparatory focus withdrew from the study approximately three weeks after the teachers’ interviews. About four weeks later, the educational provider abandoned the gamification project due to a lack of expected results, commitment and time from teachers, students and individuals in the management. Project abandonment: “*the termination of all activity on the project*” [7 p.69] are a recognised problem in software research and the software industry [8]. An identified cause for project abandonment is disregarded stakeholders[9]. The stakeholder, defined as *anyone affected by or who has an interest or stake in a particular issue*, has a longstanding position in Information Technology (IT), particularly Information System (IS) research. The present case study recognises teachers as stakeholders’ implementing a gamification solution in the learning environment.

Consequently, this inquiry’s attention is the teachers’ interests and possible conflicts of interest when implementing gamification in upper secondary education. The investigation used the following research question (RQ): *What factors influence teachers’ use and adoption of a gamification learning system?*

The rest of the paper is organised as follows: Section 2 displays an outline of related works and previous research on designing and implementing gamification. It gives an introductory presentation on research on IT stakeholders and concludes with research regarding teachers notion and acceptance of gamification in the learning environment. Section 3 gives an overview of the gamification project and presents the empirical case in different subsections regarding the gamification studio and their platform (3.1); the school implementations (3.2) the gamification design workshop; (3.3) the gamification widget in the schools learning management system (LMS); (3.4) and the flow in the gamification design (3.5). Section 4 introduces the study method, the participants (4.1) and data- collection (4.2) and analysis (4.3). Section 5 presents the findings of the study thematically through the four identified themes. Section 6 discuss the findings considering the previous research presented in Section 2. In section 6, there is also a reflection upon the study limitations (6.1), followed by the study conclusion (6.2) and implications for future studies (6.3).

This work is licensed under a Creative Commons Attribution-NonCommercial International 4.0 License.

Mindtrek ’21, June 01–03, 2021, Tampere/Virtual, Finland

© 2021 Copyright held by the owner/author(s).

ACM ISBN 978-1-4503-8514-5/20/06.

<https://doi.org/10.1145/3464327.3464347>

2 RELATED RESEARCH

Though Gamification scholars agree that gamification is complex to design [10–12], and the understanding of when gamification will function as intended and when it will not is in its inception [12–15]. Research on gamification design suggests that gamification designers need a comprehensive knowledge base and skillsets such as skills in game design, knowledge on motivational psychology and an understanding of the user and the intended scope of the implementation. The organisational context, such as project stakeholders in which gamification is being introduced has been highlighted as necessary to comprehend [10, 13, 16]. The stakeholder's role has been identified as a factor in gamification implementations [17, 18]. Nevertheless, in literature reviews on gamification design, their priority and urgency in a gamification project are vague [12, 15]. In IT research stakeholder's role are more salient. It has been stated that an understanding of stakeholders' perceptions, anticipations and interrelations during IT implementation is crucial for avoiding raised project cost or, in the worst case, project abandonment [9]. However, a stakeholder perspective and participation can positively impact IT projects' success [19, 20]. If designers and developers identify the different stakeholders and their interests in IT projects and address them, it improves the acceptance of a novel IT system [21]. It has been stressed that not just the end-users interests should be recognised in implementing an IT-artefact. However, several other stakeholders' interests and possible conflicts of interest are beneficial to decrease friction when implementing an artefact in an organisation. Therefore IT design needs a broad stakeholder spectrum to build usable systems and create value across organisational and technical borders [22]. In the field of educational technology, teachers have been identified as influential stakeholders [23, 24] regarding the approval of educational technology in learning environments depending on their approaches and previous experiences [25].

Previous gamification studies have addressed teacher attitudes, adoption factors, and past experiences. One exploratory survey from 2016 has investigated 98 higher education teachers' attitudes and gamification use. The study indicates only a small proportion of teachers used gamification in their courses, while the overall teacher attitude towards gamification was positive across all demographics [26]. A 2019 descriptive survey of 88 software engineering professors from different universities and educational institutions have argued that teachers' main reasons do not adopt gamification is their lack of knowledge [27]. The study also displays a positive tendency towards teachers' adoption of gamification in the future [27]. Also, a 2018 exploratory survey of 47 teachers present an overall positive perception toward gamification tools in online learning [28]. A 2017 phenomenology interview study involving 16 higher education teachers identifies four barriers: B1) lack of resources, B2) student apathy, B3) poor subject fit, and B4) learning environment dynamics. They also note four drives: D1) increase in student's attention and motivation, D2) higher amusement, D3) increased interactivity, and D4) easiness to learn [29]. Overall, the teachers perceived that there are benefits to using gamification in the learning environment. However, gamification was also regarded as a potential factor that can jeopardise the learning atmosphere [29].

A 2020 explanatory survey of 375 instructors examined teacher intentions to use gamification in Moodle courses. The study interprets its results through the technology acceptance model to argue that a fitting gamification integration with actual course content raises teacher motivation to use gamification [30]. Another relevant source is a 2017 one-year longitudinal study that observes and interviews two upper secondary education teachers who used a gamified application in their foreign language classes [31]. The teachers comprehended the gamified application differently. One teacher stated positive experiences and used the application amply in class, while the other stated negative experiences and a loss of control in her learning environment. One teacher had participated in the application's design process, while the other teacher had minor involvement in the process, which yielded a lack of ownership [31].

In summary, previous studies have shown a mixed impression of teachers' views on gamified educational technology in the learning environment. While there is an overall positive attitude towards gamification [26–28], few teachers seem to have used it in their learning environment [26, 27]. Factors affecting teacher practices appear to be contextual and dependent on the students [29]. Moreover, gamification's compatibility with the instructional content appears to facilitate teacher perceived usefulness [30]. Finally, teachers' assumption of ownership when implementing gamification in the learning environment seems crucial [31]. The present inquiry intervenes into the previous work by adding and analysing the gamification studio's voice that designed and implemented the gamified tool in the learning environment. Thru qualitative interviews with school and studio personnel, this study identifies and addresses different factors that can affect gamification implementation in an upper secondary education environment.

3 MATERIALS

This study is a part of a government-funded gamification project that occurred from 2018–2020 in Sweden - Gamification of Automation stRategIEs for InDustry 4.0 (GARFIELD). The project concerned how gamification can influence completion and dropout rates in education and training. The project proposition was that learners would have a greater chance completing their courses if the courses were gamified. This project defines gamification as 'the use of game mechanics in non-game context' [32]. The gamification designs were implemented with a prototype application programming interface (API) redeveloped to fit a learning context. The school with a higher education preparatory focus, hereafter referred to as SocialSci, and the school with a vocational focus, hereafter IndustrialTech, serve as the empirical case for this study.

3.1 The gamification studio and their platform

The gamification studio (hereafter Studio) was a start-up company consisting of individuals with different practitioner backgrounds such as serious games, art direction, user experience, interaction design, software engineering, instruction and learning. Several of the employees had years of experience working with gamification and e-learning as advisors and specialists. The start-up used an interoperable business process-agnostic gamification API-platform. The API-platform connects an existing IS with the gamification

library through an API, which separates the gamification logic from the IS's internal logic. This process allows for a non-invasive introduction of gamification into the IS. Each client IS involves one or more setups within the platform's framework through an API-key allowing for the definition of standardised interfaces and design artefacts while at the same time giving each client the ability to adapt and modify their gamification design without affecting other clients' designs (Appendix 1).

3.2 School implementations

IndustrialTech is a municipal upper secondary school with a practical orientation focused on students' later employment in the construction industry. The IndustrialTech implementation concerned a blended learning mathematics course in the standard curricula. The aim was to increase student engagement and completion rate in the course without lowering the national curricula's knowledge requirements. SocialSci is a private upper secondary school with a theoretical orientation. The school focuses on students' further academic studies in the humanities or social sciences. The SocialSci implementation concerned a blended learning resilience course not included in the standard curricula. The course aim was to increase student engagement and completion rate in several courses by providing them with information on different topics, such as study techniques, grit, and self-empowerment.

3.3 Gamification design workshop

Both projects started with a gamification design workshop. The author attended and contributed to the workshop in a background position. The design workshop was conducted to collect information about the case, intended course(s), learning content, students, and supposed effect of the gamification implementation. Due to the similarity of the implementations, the studio planned design workshop simultaneously and conducted them three weeks apart from one another. Each workshop lasted approximately four hours and was outlined with a leader, a gamification designer, running and controlling the event by delivering different tasks for the participants [33]. The design workshop was the foundation of impending gamification blueprint—the gamification design document. The designer conducted different brainstorming exercises, landscape mapping, and forced ranking in relation to the upcoming implementation (see [34]). A four-step macro (the entire course) and micro (one typical session) user-journey were created based on the outline of previous literature [35, 36]. The designer performed persona creation with the workshop participants to determine the student (user) interests and attitudes towards games, games in learning, study habits, and digital experiences. This information was later compared with existing persona frameworks used in game and gamification designs [37, 38]. The gamification designer also asked questions concerning the learning management system, such as whether the teachers (mid-end-users) and students (end-users) were familiar with it and how the schools used it on a day-to-day basis. Metrics such as current completion and dropout rates were also discussed.

The designer transcribed the design workshop's outcomes (e.g., post-it, heat maps, flow charts), which were then included in a gamification design document that functioned as a blueprint for

the upcoming implementation. Before designing, installing, and implementing the gamification API-key in the two LMSs, another designer peer-reviewed the gamification design document. The review process involved a checklist of gamification design heuristics based on diverse gamification design literature [35, 36, 38–40], gamification in learning literature [41, 42] and experiences from the joint company knowledge-base.

The Studio did not decide the course in which the gamification was implemented. IndustrialTech and SocialSci separately chose which course they determined crucial for increasing their completion rate. In the IndustrialTech design workshop, five individuals participated—two from the Studio and three from IndustrialTech. Following the design workshop, one of the teachers volunteered as project manager (PM). In the SocialSci design workshop, two individuals from the Studio, managers from the school company (the communication manager, educational president, two education managers, and quality and development manager), and the managers' assistants—altogether twelve persons—contributed to the workshop discussions. A principal at the school company was assigned as PM for the SocialSci implementation.

3.4 The gamification widget in the LMS

The API in this study functioned as a graphical control interface (GUI) disclosure widget added to the existing LMS interface, which was decided in the gamification design workshop (Figure 1). The IndustrialTech and SocialSci widgets had similar appearances but differed regarding the gamification elements in the separate implementations. In IndustrialTech, the gamification elements of levels, badges, and shops were used. In SocialSci, the gamification elements of levels, badges, and tutorials were used. The gamification balance, such as level/experience points curve, were the same in the two implementations. From a gamification design perspective, the gamification feature with the most variation was the badge element. IndustrialTech badges had an academic focus, while SocialSci badges had a disciplinary focus (see Section 3.6). The participants discussed and selected the badge contexts in the workshop based on the implementation's purpose.

3.5 The gamification flow

The schools' courses were gamified through an API implemented in the schools LMS by the Studio's tech-team. The widget added a visualisation of student progression in both courses (see Appendix 2). Every time a task was completed, the students gained experience points (XP). When students completed all tasks in an achievement, they were rewarded XP. These XP were needed to advance levels, which were designed to show student progression in the course. The achievement module served as the backbone of the gamification design. The achievement modules were based on a set of different goals and were visualised by different icons. The achievements were designed to engage the students in completing different course tasks in the LMS system. When achievements were completed, the box related to the task was checked. In both gamification designs, there were common achievements such as finishing quizzes (quizzier) or commenting on other students' work (commenter). Moreover, there were achievements designed specifically for the implementation context, such as 'completed meta-cognition section' in the

Figure 1: The LMS interface with GUI widget. Above: IndustrialTech. Below: SocialSci.

resilience course at SocialSci and ‘completed math test: equations’ in the mathematical course at IndustrialTech. The achievements were connected to student behaviours that the designers had cultivated with the design workshop practitioners and which were deemed essential for the students’ probability of success. This design resonated with the implementations’ ambitions to increase student retention and reduce dropouts from the course.

There were also small dissimilarities in the implementation’s gamification design. When students gained a level in the IndustrialTech implementation, they were rewarded with coins, a fictitious currency, that they could use later in a shop module. The students could buy virtual rewards, such as *exam booster* extra points for their final exam, in the shop module. In the SocialSci implementation, a tutorial module in the resilience course gave the students an introduction journey called the *Voyage*. This introduced them to

Table 1: Study participants

Affiliation	Role	Age	Gender	Interview date	Interview time	Name	In workshop
Studio	Lead gamification designer	50	Male	10 Feb.	45 min.	Gam1	SocialSci
Studio	Gamification designer	39	Male	20 Feb.	42 min.	Gam2	IndustrialTech
Studio	Customer success	36	Female	3 Feb.	44 min.	Gam3	IndustrialTech
Studio	Studio PM	43	Female	24 Feb.	35 min.	Gam4	SocialSci
IndustrialTech	Teacher/local PM	33	Male	11 Nov.	35 min.	Tec5	IndustrialTech
IndustrialTech	Teacher	50	Male	13 Nov.	30 min.	Tec6	IndustrialTech
IndustrialTech	Teacher	44	Female	13 Nov.	31 min.	Tec7	IndustrialTech
SocialSci	Teacher	38	Female	15 Nov.	33 min.	Sci8	No
SocialSci	Teacher	53	Female	12 Nov.	26 min.	Sci9	No
SocialSci	Local PM	45	Female	19 Nov.	66 min.	Sci10	SocialSci

the school and its concepts, like a treasure hunt done at the school premises.

4 METHOD

The present study was primarily designed to evaluate the gamification implementation at the two schools separately. The author of the current study took part in the GARFIELD project to observe, collect data, analyse, and write a report on the project of the two implementations and how the API functioned in the specific LMS as well as in upper secondary education. However, when it became apparent that the SocialSci project suggested anything but a straightforward implementation of gamification, the author decided to design a specific case study to identify the facilitating or impeding factors when implementing gamification in upper secondary education by interviewing individuals from the gamification studio and employees from the two schools.

4.1 Participants

Ten participants were interviewed for the inquiry. The study participants consisted of designers, developers and projects managers from the Studio, teachers from the two schools and the project manager from the SocialSci project (previously headmaster at the SocialSci school) (See Table 1). This study uses a purposive sampling strategy [43] with an inclusion criteria ensuring that all the participants had participated in the project and all teachers experienced the widget in their daily work. Participants from the Studio and IndustrialTech were the only ones from each organisation who were involved in the gamification project. The two teachers from SocialSci desired to provide an interview (section 7). All the participants were informed and provided consent.

4.2 Data collection

The author collected the data through semi-structured interviews to obtain a detailed description of the inquiry. Before the interview sessions, the author prepared a semi-structured interview guide that contains 16 open-ended questions for teachers and 14 for the gamification studio. The author also performed two reliability

checks with a senior researcher to reduce error and bias in the semi-structured interview guide [44][45]. The interview sessions were conducted through Zoom due to geographical distance, and the data collection was conducted in two stages. SocialSci and IndustrialTech were interviewed during a two-week period when the two courses started. In the interviews with the school, respondents were asked to describe the implementation and provide their thoughts and perceived outcomes. The Studio was interviewed during a four-week period after the semester. The studio respondents were asked to describe their impressions of both implementation projects.

Ten interviews, approximately 400 minutes of audio recorded materials, constitute the empirical material. Interviews in studies with two cases that have different outcomes can lead to certain problems. Individuals tend to frame the best version of themselves that does not necessarily correspond with the correct version [43, 46]. This was evident in the statements from SocialSci and Studio, as that project had a negative outcome. As a result, the author has developed tactics [44] and precautionary measures [46], such as the opportunity to opt out, guaranteeing anonymity, not using the respondent's real name during the interviews, no camera recording, and inviting each respondent to Zoom by hyperlink.

The interviews were conducted and transcribed in Swedish and then translated to English by the author. During this process, the author performed minor edits for increased readability and to avoid translation errors, remove verbal filler sounds, and convert from colloquial to literary language. A native Swedish/English speaker compared and reviewed all the translated excerpts with the anonymised original transcripts.

4.3 Data analysis

The data underwent a thematic analysis. The author followed the six phases of thematic analysis developed by Braun and Clarke [47]. For familiarizing with the data the authors transcribed the interviews and simultaneously performed a level one, descriptive, coding to ensure the retainment of valuable insights gained from the conversations [47]. All interview transcriptions were uploaded in the data analysing tool MAXQDA for the initial and focused

Table 2: Identified factors

Theme	Factor(s)
Director of the gamification project	Teacher/Educational provider driven
Teachers' perceived applicability	Efficacy/inadequacy of the gamification
	Ownership/subjugation of the gamification
Teachers' regard for their students	Considerations of the students positive/negative response
	Relevance/irrelevance for student's effort
Meaningful teaching material	Confidence/Doubt about relevance of the teaching material
	Gamified course included/excluded in the national curriculum
	Mandatory/Optional gamified course

coding phase. For level two, initial, coding, the author applied a thematic analysis on the dataset to aim for accessibility and a versatile theoretical approach toward qualitative data [47]. The process involved an inductive data-driven coding approach, moving back and forth between new and pre-existing data to search for inquiry patterns [47]. During the initial coding, the author began to distinguish clusters and started to connect the initial patterns. Approximately ten weeks after the first interview, all transcripts underwent a level three, focused, coding seeking conceptual similarities in the data and creating patterns [47]. A digital thematic map was formed in this phase for clustering and examine the patterns for matching meaning units: respondents' expressions and statements that affirm comparable factors in the implementations.

The thorough three-step descriptive, initial, and focused coding assisted in detecting the comparable factors in the study. During this process, several concepts were divided, merged, transformed, and omitted. Ultimate, to explain the data, the defining and naming of the themes were applied to identify their focus identifying factors to understand the implementations' different outcomes by apprehending the outlined factor connections among the participants from the schools, Studio, as well as implemented technology.

When conducting case comparisons, there is a possibility of yielding biased and misleading results [48]. To ensure trustworthiness, reliability, and validity in the research the author has used the following techniques developed by Belotto [45] and Shenton[44]: providing a detailed description of the investigation, data gathering, research design, organisations taking part in the study, sampling and data collection methods, data collection period and length of the collection sessions. For objectivity, a recognition of the study shortcomings is included (section 7).

5 RESULTS

In line with the RQ: What factors influence teachers' use and adoption of a gamification learning system? this inquiry identifies four themes, each with comparable underlying factors that the respondents expressed had a positive and negative influence on the outcome of the gamification implementation.

All topics and factors are gathered in Table 2. In the result section, the respondents are referred to with the label they are given in Table 1

5.1 Director of the gamification project

A topic in the interviews with the studio personnel and SocialSci project leader, was the difference between having a top-down contra

a bottom-up gamification project. Gam 1 and 3 declared notions regarding how the teachers' experiences of ownership, or lack thereof, in the project affected the outcome:

'IndustrialTech project was teacher-driven from the beginning, while for SocialSci there was a decision (initiating the gamification project) made "upstairs" by a management team, far from the classroom. I think it influenced the project. When the project at IndustrialTech started, we had a gamification workshop with teachers who would use the widget in their classes. It was their subject, everyone was interested, everyone understood what it (gamification) was about. We worked closely with the teacher, who in the end was the carrier of the venture. But in the SocialSci case, we were much further away from the teachers, and that created a distance and loss of commitment' (Gam 1).

Gam 1 communicated different experiences in the projects due to the extent of the teachers' presence in the projects which the respondent deems important regarding the outcome. Gam 3 noted that the absence of teacher communication indicated low teacher ownership and value of the gamification tool:

'SocialSci project was centrally administered. Top management for the organisation had identified a problem, a problem that they wanted gamification to be the solution to. At the same time, they wanted it to run by itself. They had an image of gamification as a solution that no one had to get involved in. I do not know if it was something we had communicated or not. But I experienced that this was how they perceived it, and then they were very disappointed when this was not the case' (Gam 3).

The Studio compared the implementations and differentiated the outcomes by SocialSci being centrally administered and IndustrialTech being teacher-driven. When the studio respondents described the SocialSci implementation, their statements display doubtfulness of the purpose of the gamified resilience course, which was a decision from management.

The PM, Sci 10, also described the choice of a top-down rather than teacher-driven tactic:

'Implementing in an already existing course could be done (. . .) Allow the teacher to decide what classroom behaviours rewarded in the gamification tool, 'submit

on time' and such things. But it was not what we (management) wanted; therefore, we chose something that ran parallel with other courses.' (Sci 10)

Sci 10 declared that other courses could have been gamified, giving the teachers more influence, but the idea had been discarded by management. Her expression regarding the gamification solution materialised as it had been unfitting for the school environment, forcing the teachers to run a course that they did not have an interest in running. If the gamification tool had been implemented in their standard courses, the teacher would have more use of the solution. The first theme implies an experienced dissimilarity regarding the centrally administrated SocialSci project and the teacher-driven IndustrialTech project, which directly functions in teachers' day-to-day work, giving them a sense of ownership. The first factor is interconnected with the following factors presented.

5.2 Teachers' perceived applicability

A subject in the interviews was the perception of the gamification tool's quality, its tangible and possible applications or how it can or should be used – its applicability – in the school environment. The respondents' statements and opinions differed; however still dealt with the same theme. Teachers provided expressions regarding the widget usefulness but with different attitudes. Tec 5, 6 and 7 communicated efficacy and emerging ownership towards the gamified tool. Tec 6 expressed a determination to learn how to use it better and a need for useful tools in the learning environment:

'When I am more comfortable to handle it (the widget) better [...], it will be easier to guide them (students). That's good, the more tools you have, the better. And here we can make the teaching material ourselves, what we think they should be learning' (Tec 6).

Tec 6 describes the tool worth investing time in due to the student interest in it. He notes that he wants to grasp more of tools functions to help his students even more. Also, Tec 6 gave the impression that it is a good thing that *'we can make the teaching material ourselves'*, which suggests that there is a need for the teachers to have a sense of control over didactical aspects such as teaching material or tools in the learning environment. Both Tec 7 and 5 described the initial weeks as rewarding and providing of a team spirit and ownership:

'We did a lot together [...] I planned one week, and my two colleagues planned the next two weeks. In that way, I planned one week and got three weeks back. Since we use the same course design in the LMS and the widget, it lessens the workload' (Tec 5).

These statements indicate a sense of ownership caused by the redesign of their teaching material, which also results in their subsequent comprehension of the widget. The required tasks of the gamification, such as co-planning, discussing, and developing lessons collaboratively made the teachers actively involved in the gamification process by sharing ideas, developing lessons drafts, and sharing learning resources.

The SocialSci teachers indicated dissatisfaction and reservation regarding the ambitions of the gamification implementation. Both Sci 8-9 expressed that the widget had not corresponded with their notions of gamification during the first weeks. Sci 8 expressed:

'I have been very enthusiastic about the idea. I was at a lecture in [a city in Sweden] about gamification, and I think it is an incredibly fascinating and exciting idea [...], but I had hoped that this (the project) would have revolved around an actual school subject' (Sci 8).

Sci 9 also expressed herself similarly:

'When I heard about it (the project) the first time, I thought it would be part of the teaching. You could imagine that you (as a student) did some recap or something. It would have been quite easy to put in the format' (Sci 9).

Sci 8-9 expressions indicate that the widget had low applicability for them in their day-to-day work considering that the gamification solution did not aid them in their courses but added an additional course to supervise. Which probably gave them a higher workload. Also, as the project did not revolve around an *'actual school subject'* and was not *'part of the teaching'* implying the teachers' disappointment on how the gamified solution had been executed at the school, not helping the teacher but rather hindering them. Sci 10, reflected on how the project's multifaced ambition affected the outcome:

'I have struggled with this. It's not only a gamification project, but also a new course. We (the education provider) want to evaluate the course with the mentors and principals later. Here there is work that remains to be done' (Sci 10).

Sci 10 expresses uncertainty regarding the project's execution regarding its added value to the school while also adding more effort for the project's teachers. The Studio interviewees stressed:

'What I experience as the biggest difference was the more day-to-day communication between IndustrialTech and us, discussing concrete activities in the classroom considering the design and implementation of the project. Such discussions did not occur in the SocialSci project' (Gam 4).

Similarly, Gam 2 disclosed a vast knowledge exchange which was important for the IndustrialTech gamification implementation:

'All (IndustrialTech teachers) contributed to the workshop, providing good insights into how they taught, entirely disconnected from the technology [...] what they considered essential and to focus on. That view is precious when doing a gamification design, making it easier to set up' (Gam 2).

The Studio described the teachers differently. The teachers at IndustrialTech are described as co-designers, while the teachers at SocialSci are portrayed as absent.

The second theme depicts the schools' different approaches towards the project by highlighting the tool's dissimilar perceived applicability. IndustrialTech teachers gained ownership by being included in the project, which created an understanding of how the widget could enhance their job performance. By being excluded, the widget lacked a clear connection to SocialSci teachers' day-to-day work, limiting their chances of achieving ownership over the project.

5.3 Teachers' regard for their students

Another subject was the students. IndustrialTech teachers expressed that they saw a potential in the gamification widget because it affected their students positively:

'They (the students) do not have anything against it (gamification), so to say. When they start to talk and relate, that's what I want to get out of it. I have heard that they began to buzz about it and heard them compare their progress [...] it feels like a positive process' (Tec 5).

A similar expression is provided by Tec 6:

'A student told me today: "This is the shit, I like this." He is not active in class otherwise. If gamification makes him do the course tasks, he learns more because he does not do anything else in the class otherwise. Gamification has had an impact on him and will have a strong impact on his study results' (Tec 6).

Tec 5 and 6 revealed how the students' reactions to the gamified content indicates that the teacher perceived a positive change in the students' behaviours in the learning environment. Tec 7 had a more deliberate approach:

'I do not know about the classes that I have this year, if their performance is due to gamification, or if it just happened that I have better students this year. But in any case, I do not think it worsens anything. It can almost only add something positive' (Tec 7).

Tec 7 expressed hesitation regarding whether the noticed positive effect was due to the widget or the student population. Tec 5 and 6's statements are more optimistic regarding how the widget improved the students' academic achievement. Tec 5-7 described the widget as useful in their day-to-day work due to the notion of a positive effect on the student's engagement and attitude towards mathematics.

SocialSci teachers Sci 8-9, instead discussed the students in relation to the absent effect of the widget. Sci 8 uttered her concerns regarding student's motivation because the course did not affect their grades:

'The student's reaction is straightforward: "Do we need to do this? Is this mandatory? Do we get grades for this?" And then you must answer honestly because that's what we should do so: "No, you do not have to do this, it is completely voluntary, BUT you can benefit greatly from it" There is not one of my students who has done a single task' (Sci 8).

Sci 9 expressed that a voluntary course not included in the national curriculum affected the students:

'I notice a declining interest [...] It would have been better if it had been mandatory. It might have worked better' (Sci 9).

Sci 8-9 revealed that the resilience course outline had a low appeal to their students, indicating that the incentive of gamification itself was not enough for the students to participate. The teachers expressed a low sense of cohesion regarding the purpose of gamification, showing sympathy for the students' uninterest.

In the Studio interviews, Gam 3-4 stated that teacher familiarity with the setting, students, and subject affected the projects:

'Experience and knowledge, I think, that was important. That they (IndustrialTech teachers) worked as close to the student as possible and knew what goes and what doesn't, but also that they knew their classroom, knew their students, and knew their subject. I think that was crucial' (Gam 3).

Gam 3 stated that the teachers' familiarity with their students was an essential part of the implementation outcome. Gam 4 described that both students and teachers had to mutually perceive the widget applicability:

'If you are going to do "things", there must be "things" that are relevant for both students and teachers. "Things" relevant in their daily routines, what they work with. Then you have a 100 times greater chance of succeeding with anything, everything' (Gam 4).

Gam 4 underlined that an understanding of teachers and students' necessities is the preferable approach to gamifying a learning environment.

In the third theme, the Studio stressed that both students and teacher must comprehend the gamified course's meaning, which was the situation at IndustrialTech, but not in SocialSci. Likewise, Sci 8-9 expressed that the students disliked the gamified course and questioned its motifs. These are questions that the teachers at SocialSci had a hard time answering, as they also doubted its value. IndustrialTech emphasised how the API provided them with an additional tool to motivate the students in the learning environment, making even some of the more disinterested students interested in mathematics.

5.4 Meaningful teaching material

All the respondents had opinions on how the teaching material influenced the projects. Opinions regarding the material's characteristic, curricula fit and previously verified useful through the teachers' proven experience in their everyday work emerged in the interviews. IndustrialTech's teachers expressed that the gamified widget allowed them to reuse their materials. Implying that the gamified teaching material was vital for them and – by extension, affected their implementation outcome. The possibility for the IndustrialTech teachers to reuse their already established and verified teaching material made them self-confident, indicating a lower threshold for adopting the gamified tool. Tec 5 described this situation as follows:

'It will only get better, especially if we can reuse what we already have, you can improve it continually. I am confident that this will be great because it does not replace something, it works as a complement to what we are already doing' (Tec 5).

A relevant and distinctive teaching material tested and verified in previous courses seemed to facilitate the gamification implementation. Moreover, IndustrialTech teachers noted the importance of the widget being compatible with and preferably even amplifying previous teaching material used in the learning environment. The SocialSci teachers also discussed how the novel teaching material created for the resilience course affected the gamification project regarding student interest. Sci 8 expressed:

'They (the students) already know this! They feel that it is padding, we have discussed this several times with them' (Sci 8).

Sci 9 provides a more neutral opinion on the teaching material in the gamified resilience course:

'My views are that material is ok. It needs to be polished before you can use it. But to get them to work in this way now? No. I have a bit of a hard time to see that it would work' (Sci 9).

Both statements by Sci 8 and 9 specify that teaching material quality affected the relevance of the gamification implementation in the LMS for the SocialSci school. Regarding the content, Sci 10 stated:

'Management would probably not have been interested in other variants. [...] It required more effort to do a completely new course. It has cost us much more. They had to hire me, for example, otherwise there would not have been a teaching material. Then again, it's not incredibly profound or challenging material, obvious things' (Sci 10).

Sci 10 expressed that the gamified project outline, training students in resilience, was a decision made by management, making it difficult for the teacher to modify it. Sci 10's explanation that the teaching material was shallow, obvious, and simple to comprehend correlates with the statements provided by Sci 8 and 9. However, the teachers and students also recognised that the simple content was ineffectual, making them uninterested in the gamified course and affecting the implementation outcome. The Studio respondents also expressed their opinions regarding how the course differences affected the outcome. They implied that a fitting teaching material would have better facilitated the use of the gamified widget in the LMS. Gam 1 expressed that:

'I think the course subject had a huge impact (on the outcomes of the projects). Look at it in any way you want. At IndustrialTech, we gamified a math course! When you attend math class, you cannot help it, but you will probably work with math. The gamification was designed to facilitate and improve processes that already existed, amplifying the student's user experience in the LMS while undertaking mathematics. [...] In the other case (SocialSci), something was added that was not part of the students or teachers' day-to-day activities. Obviously, there was an opposition against it, coming up with something novel, maybe they did not fully understand the purpose. It is difficult to tell what they opposed: the gamification, or the voluntary course?' (Gam 1).

Gam 1 addressed the differences between implementing a gamification widget in an established mandatory mathematics course and in a novel voluntary resilience course. This issue makes it difficult to tell whether the widget or the course content most affected the outcome. However, Gam 3 provided a more certain opinion:

'Gamification was not the problem! They (the students) did not want to take the course because they did not

see the point. [...] Gamification cannot really solve the whole equation itself' (Gam 3).

Gam 3's expression indicates that the course was not relevant to students, making the widget inadequate for the students need. In contrast to the Studio opinions on the SocialSci course and teaching material, the Studio appeared to prefer IndustrialTech's approach of reusing a previous course. Gam 2 stated:

'We based the design on the course previous plan, with similar material, to minimise the workload for them (the teachers), aware that we had a tight deadline. It was not the first time they had run the course. They were experienced teachers who had run the course with basically the same approach. We reused the material they used in the LMS before reprocessing their course design. With modifications for gamification, of course' (Gam 2).

Gam 2 notes that the outcome at IndustrialTech was affected by the quality of and teacher familiarity with the teaching material. The Studio statements indicate that the quality of the soon-to-be gamified teaching material as important for the outcome. The Studio respondents communicated that the familiar material acted as an enabler for the teachers' adoption of the gamified widget. At the SocialSci school, the Studio marks that the unfamiliarity and lack of a clear motivation seems to have affected student interest.

To conclude the fourth theme, the Studio declared the content as one important factor affecting the implementations. At IndustrialTech, a significant amount of pre-existing and verified content could be reused. At SocialSci, however, new content had to be produced which had not been tested before it reached the students. Respondents at SocialSci also reacted to the quality and shallowness of the content, including its producer Sci 10. Sci 10 stated that using the widget affected both student and teacher motivation. IndustrialTech respondents communicated that using previously established teaching material made the added workload of learning how to use the gamification tool more endurable — reducing the threshold for commencing using the tool in their courses. IndustrialTech respondents appear to have a better sense of control over the course's teaching material, which facilitated their ownership in the gamification tool, giving them a better coherence in the learning environment than the teachers from SocialSci.

6 DISCUSSION

The significant finding of the inquiry is that the identified factors that influence teachers' use and adoption of a gamification learning system seem to revolve around the teachers' inclusion and cooperation during the design and implementation provides the incentive to apply gamification in their learning environment. Analysing the factors implies that teachers' early inclusion created ownership of gamification project generating a more solid grounding for the implementations. Providing the teachers at IndustrialTech with control in the project and involving them in the design seems to have affirmed the implementation. The teachers were keen to use the widget and master its functions because they recognised its benefits in their day-to-day work and perceived it as applicable. However, not being included early in the project not controlling the implementation, as the teachers at SocialSci, seems to have created

a yoke for the teachers, making them disapprove of the intention of the implementation. In this study, teachers take a crucial position as stakeholders affecting the two gamification implementations' outcomes. The teacher position is significant when introducing novel solutions in the learning environment.

Moreover, these investigation findings associate with previous gamification studies done in higher education. Regarding the existence of an insignificant 'subject fit' or 'waste of time' barriers and drivers such as 'increases student motivation', 'increases student attention to learning materials' and, 'active learning' drivers when implementing gamification in higher education [29] seems to exist in upper secondary education as well. As both studio and school personnel communicated, the results add the dimension that depending on if the course is mandatory or not affects the gamification implementation. Also, as this inquiry is conducted in upper secondary education, it adds the national curricula' role to consider when implementing a gamification solution in upper secondary education. The presented study also expounds that gamification implementations that correspond with course content increase university teacher interest [30]. The conducted case study rendering that correspondence with the course is not just beneficial, but indispensable for teachers in upper secondary education to accept and commit to consistent use of a gamification tool. Deducing the results with the findings from [29, 30] there seem to be interrelating issues for implementing gamification in higher education and upper secondary education. Also, this study's findings also strengthen the argument that limited teacher participation in the early phases of a gamification project creates low teacher ownership and interest [31].

Elaborating on the previous finding regarding teacher ownership; this investigation appends that a vital factor that seems to have affected the two schools' gamification implementation was the stakeholder constellation in the implementation project. GARFIEIDs goal was to examine if gamification could increase student completion rate and decrease the student dropout rate, and while IndustrialTech teachers had the freedom to develop the gamification implementation in the direction they regarded essential for the project goals, SocialSci teachers had to follow what the educational management perceived essential for the project goals. This seems to have affected the two implementations as the path to the project's goal, not just the goal itself, was clear for the IndustrialTech and more blurred for the SocialSci.

More specifically, this study problematises previous scientific findings regarding teachers' recognition of gamification [26–28] as being too superficial. These research inquiries are too superficial and unproblematic in their conclusions, generating a picture of excessive teacher recognition for gamification in the learning environment. The studies [26, 27] have examined teachers' perceived notion of gamified educational technology that is positive they deem positive. Concurrently, only 19 of the 88 higher education educators (16,72%) had used gamification in their courses [27]. Correspondingly, as most 98 higher education teachers expressed a positive attitude towards gamification, only 11 of the teachers (11.30%) had used gamification in their courses [26]. As this study shows the teachers at SocialSci expressed that they were initially enthusiastic towards the gamification project (section 5.2), however when gamification turned out to be somewhat different than they

had expected they changed their opinion towards it. This argues for more gamification studies with teachers who have real gamification experience in the learning environment.

6.1 Limitations of the study

Causality is a methodological problem with this inquiry. For instance, the compared courses were different, as the mathematics course is a compulsory subject in the national curricula, while the resilience course was optional for students. This is addressed in section 3.1 by the author and sections 5.3 and 5.4 by respondents from SocialSci and the Studio. The comparative value should also be viewed with caution. However, as the resilience course was optional for the students and was not directly connected to their grades, it indicates that gamification alone could not make it attractive enough within the school environment; this further discussed in sections 5.3 and 6. Another limitation is that the Studio respondents were interviewed later than the school respondents, which might have affected their recollection of certain events. Two of the studio respondents mentioned in their interviews that they did not precisely recall something or that their given statement might be a fabrication rather than fact. The study's sampling method might also be criticised in the SocialSci case, where only two of the 21 teachers using the gamification widget at the school decided to participate in this study. It is difficult to determine if these two teachers are representative for the entire group. Moreover, interviews with students using the widget had considerably improved the inquiry, especially in the SocialSci case. The author made attempts to reach the students without any luck.

6.2 Conclusion

This exploratory case study identifies different factors that affected teachers/stakeholders acceptance of the gamified widget's in the learning environment, such as ownership, perceived applicability, concerns regarding the students, and its significance to the teaching. The finding gives insight into the importance of teacher/stakeholder when implementing gamification in upper secondary education. Teachers must recognise the purpose of the gamification; otherwise, it will be an arduous project. The factors identified in the study (see Table 2) facilitated the implementation, while its absence impeded it. In the presented case study, the lack of required factors led to disinterest, which resulted in the project abandonment for SocialSci school. At IndustrialTech, the outcome was different, possibly the presence of the matching factors.

6.3 Further research

The author proposes that further investigations need to be performed concerning practical implementations of gamification in the school environment. Examining this study's identified factors further can broaden the understanding of gamification in a learning environment under different circumstances and across educational levels. Further investigations regarding the priority of the stakeholders in gamification implementations should be beneficial. Regarding whom they are (identification) and what they require (evaluation). In this sense, gamification researcher could use robust models such as Stakeholder analysis as a foundation for their inquiries. Identifying the stakeholders is beneficial in gamification. Such research

should assist future gamification implementations, save resources, and benefit when and why gamification works and why it does not.

ACKNOWLEDGMENTS

The study was supported by the Swedish innovation agency, Vinova grant number 2018-02953. The author sends sincere appreciation to Charlott Sellberg, Svea Kiesewetter and Izabella Jedel for reading the manuscript as well as giving advice and support during the research process.

REFERENCES

- [1] Sailer, M., Homner, L.: The Gamification of Learning: a Meta-analysis. *Educ. Psychol. Rev.* 32, 77–112 (2020). <https://doi.org/10.1007/s10648-019-09498-w>.
- [2] Koivisto, J., Hamari, J.: The rise of motivational information systems: A review of gamification research. *Int. J. Inf. Manage.* 45, 191–210 (2019). <https://doi.org/10.1016/j.jinfomgt.2018.10.013>.
- [3] Dichev, C., Dicheva, D.: Gamifying education: what is known, what is believed and what remains uncertain: a critical review. *Int. J. Educ. Technol. High. Educ.* 14, 9 (2017). <https://doi.org/10.1186/s41239-017-0042-5>.
- [4] Majuri, J., Koivisto, J., Hamari, J.: Gamification of education and learning: A review of empirical literature. *CEUR Workshop Proc.* 2186, 11–19 (2018).
- [5] Jedel, I., Palmquist, A.: Teachers' Perception and Adoption of a Gamified Blended Learning Implementation in Upper Secondary Education. In: 5th Annual International GamFIN Conference 2021 (hybrid event) April 7–10, 2021 (2021).
- [6] Jedel, I., Gillberg, D., Palmquist, A.: Don't be boring: The case of a gamified google classroom. In: GSGS'20, 5th Gamification & Serious Game Symposium September–November 2020 (2020).
- [7] Ewusi-Mensah, K., Przasnyski, Z.H.: On Information Systems Project Abandonment: An Exploratory Study of Organizational Practices. *MIS Q. Manag. Inf. Syst.* 15, 67–86 (1991).
- [8] Menezes, J., Gusmão, C., Moura, H.: Risk factors in software development projects: a systematic literature review. *Softw. Qual. J.* 27, 1149–1174 (2019). <https://doi.org/10.1007/s11219-018-9427-5>.
- [9] Pan, G.S.C.: Information systems project abandonment: A stakeholder analysis. *Int. J. Inf. Manage.* 25, 173–184 (2005). <https://doi.org/10.1016/j.jinfomgt.2004.12.003>.
- [10] Deterding, S.: The lens of intrinsic skill atoms: A method for gameful design, (2015). <https://doi.org/10.1080/07370024.2014.993471>.
- [11] Hassan, L., Morschheuser, B., Alexan, N., Hamari, J.: First-hand experience of why gamification projects fail and what could be done about it. In: CEUR Workshop Proceedings. pp. 141–150 (2018).
- [12] Morschheuser, B., Werder, K., Hamari, J., Abe, J.: How to gamify? A method for designing gamification. *Proc. 50th Annu. Hawaii Int. Conf. Syst. Sci. (HICSS)*, Hawaii, USA, January 4–7, 2017. 1298–1307 (2017). <https://doi.org/http://hdl.handle.net/10125/41308>.
- [13] Hassan, L.: Means to Gameful Ends: How Should Gamification Be Designed?, (2018).
- [14] Morschheuser, B.: The gamification of crowdsourcing systems, (2017).
- [15] Shahri, A., Hosseini, M., Phalp, K., Taylor, J., Ali, R.: How to engineer gamification: The consensus, the best practice and the grey areas. *J. Organ. End User Comput.* 31, 39–60 (2019). <https://doi.org/10.4018/JOEUC.2019010103>.
- [16] Hamari, J., Koivisto, J., Sarsa, H.: Does gamification work? - A literature review of empirical studies on gamification. *Proc. Annu. Hawaii Int. Conf. Syst. Sci.* (2014). <https://doi.org/10.1109/HICSS.2014.377>.
- [17] Herzig, P., Ameling, M., Wolf, B., Schill, A.: Implementing gamification: Requirements and gamification platforms. In: *Gamification in Education and Business*. pp. 431–450. Springer (2015).
- [18] Almeida, F., Simoes, J.: The role of serious games, gamification and industry 4.0 tools in the education 4.0 paradigm. *Contemp. Educ. Technol.* 10, 120–136 (2019). <https://doi.org/10.30935/cet.554469>.
- [19] Checkland, P., Scholes, J.: *Soft systems methodology in action*. (1990).
- [20] Mumford, E., Weir, M.: Computer systems in work design—the ETHICS method: effective technical and human implementation of computer systems: a work design exercise book for individuals and groups. New York: Wiley (1979).
- [21] Lyytinen, K., Hirschheim, R.: Information systems failures—a survey and classification of the empirical literature. *Oxford Surv. Inf. Technol.* 257–309 (1988).
- [22] Sjöström, J., Goldkuhl, G.: A stakeholder-centric approach to information systems design. In: *Proceedings of EChallenges*. pp. 1–8 (2010).
- [23] Scherer, R., Siddiq, F., Tondeur, J.: The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Comput. Educ.* 128, 13–35 (2019). <https://doi.org/10.1016/j.compedu.2018.09.009>.
- [24] Eggins, H.: *Drivers and barriers to achieving quality in higher education*. Springer Science & Business Media (2014).
- [25] Barendregt, W., Börjesson, P., Eriksson, E., Torgersson, O., Bekker, T., Skovbjerg, H.M.: Modelling the roles of designers and teaching staff when doing participatory design with children in special education. In: *Proceedings of the 15th Participatory Design Conference: Full Papers-Volume 1*. pp. 1–11 (2018).
- [26] Martí-Parreño, J., Seguí-Mas, D., Seguí-Mas, E.: Teachers' Attitude towards and Actual Use of Gamification. *Soc. Behav. Sci.* 228, 682–688 (2016). <https://doi.org/10.1016/j.sbspro.2016.07.104>.
- [27] Rodrigues, P., Souza, M., Figueiredo, E.: Games and gamification in software engineering education: A survey with educators. In: *Proceedings - Frontiers in Education Conference, FIE (2019)*. <https://doi.org/10.1109/FIE.2018.8658524>.
- [28] Alabbasi, D.: Exploring Teachers Perspectives towards Using Gamification Techniques in Online Learning. Buckley & Doyle (2018).
- [29] Sánchez-Mena, A., Martí-Parreño, J.: Drivers and Barriers to Adopting Gamification: Teachers' Perspectives. *Electron. J. e-Learning*. 15, 434 (2017).
- [30] Vanduhe, V.Z., Nat, M., Hasan, H.F.: Continuance Intentions to Use Gamification for Training in Higher Education: Integrating the Technology Acceptance Model (TAM), Social Motivation, and Task Technology Fit (TTF). *IEEE Access*. 8, 21473–21484 (2020). <https://doi.org/10.1109/ACCESS.2020.2966179>.
- [31] Cruaud, C.: The Playful Frame Design and use of a gamified application for foreign language learning. <https://www.duo.uio.no/bitstream/handle/10852/60251/PhD-Caroline-Cruaud--2018.pdf?sequence=1&isAllowed=y>, (2017).
- [32] Deterding, S., Khaled, R., Nacke, L.E., Dixon, D.: Gamification: Toward a definition. In: *CHI 2011 gamification workshop proceedings*. Vancouver BC, Canada (2011).
- [33] Hanington, B., Martin, B.: *Universal methods of design: 100 ways to research complex problems, develop innovative ideas, and design effective solutions*. Rockport Publishers (2012).
- [34] Preece, J., Sharp, H., Rogers, Y.: *Interaction design: beyond human-computer interaction*. John Wiley & Sons (2015).
- [35] Chou, Y.-K.: *Actionable gamification: Beyond points, badges, and leaderboards*. Packt Publishing Ltd (2016).
- [36] Werbach, K., Hunter, D.: *For the win: How game thinking can revolutionize your business*. Wharton Digital Press (2012).
- [37] Bartle, R.: Hearts, clubs, diamonds, spades: Players who suit MUDs. *J. MUD Res.* 1, 19 (1996).
- [38] Marczewski, A.: Even Ninja Monkeys like to play. *Creat. Indep. Publ. Platform, Charleston, Chapter User Types*. 69–84 (2015).
- [39] Burke, B.: *Gamify: How gamification motivates people to do extraordinary things*. routledge (2016).
- [40] Kim, A.J.: *Game Thinking: Innovate smarter & drive deep engagement with design techniques from hit games*. Gamethinking. io (2018).
- [41] Kapp, K.M.: *The gamification of learning and instruction*. Wiley San Francisco (2012).
- [42] Palmquist, A., Adam Pamlquist: *Det spelifierade klassrummet*. Studentlitteratur AB (2018).
- [43] Flick, Uwe: *The SAGE Handbook of Qualitative Data Analysis*. Sage Publications, London (2014).
- [44] Shenton, A.K.: Strategies for ensuring trustworthiness in qualitative research projects. *Educ. Inf.* 22, 63–75 (2004).
- [45] Belotto, M.J.: *The Qualitative Report Data Analysis Methods for Qualitative Research: Managing the Challenges of Coding, Interrater Reliability, and Thematic Analysis*. (2018).
- [46] Randall, D.M., Fernandes, M.F.: The social desirability response bias in ethics research. *Cit. Class. from J. Bus. Ethics Celebr. First Thirty Years Publ.* 10, 173–190 (2013). https://doi.org/10.1007/978-94-007-4126-3_9.
- [47] Braun, V., Clarke, V.: Using thematic analysis in psychology. *Qual. Res. Psychol.* 3, 77–101 (2006).
- [48] Coleman, S., Von Hellermann, P.: *Multi-sited ethnography: Problems and possibilities in the translocation of research methods*. Routledge (2012).

ONLINE APPENDIX

Link: shorturl.at/koruK