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## Gamification in Ethics Education: A Literature Review

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# Gamification in Ethics Education: A Literature Review

## Full research paper

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## Abstract

Ethical literacy plays a significant role in human beings' decision-making, influencing the quality of interpersonal relationships, harmony, well-being, and the sustainable development of society, economy, and technology. Among various pedagogical techniques, gamification, simulations, roleplay, and other game-based approaches have been recognized as potential avenues for experience and interactive-based pedagogy for ethics education. Although there is a rapidly increasing number of studies on game-based learning, the effect of gamification on the success of ethics learning is still unclear. Therefore, by conducting a systematic review of the extant empirical literature (N=101), this study aims at exploring the state of the art of gamification in ethics education, considering research design, adopted theories, gamification interventions, dimensions of ethics learning and effects of gamification. The literature synthesis revealed a variety of utilizing gamification for ethics learning in different facets with mostly positive outcomes. Based on the discussion of the main findings, seven different directions for future research are further proposed.

**Keywords** Game-Based Learning, Serious Game, Moral, Education, Persuasive IS

## 1 Introduction

The education and training of ethics are on the agenda of companies, institutions, and organizations in various contexts, especially in light of human interaction with emerging information systems (IS) and technologies. Almost all international businesses and public organizations are legally mandated (107th United States Congress 2002) or strongly advised (The Ethics & Compliance Initiative 2023) to have codes of conduct to ensure employee alignment with company values and culture. In science organizations, scholars are required to learn research ethics and commit to ethical review. The knowledge of ethics and values is especially highlighted in educational institutions (e.g., Code of Ethics for Educators issued by the National Education Association, USA (2020); Policy Paper-Ethics and Values Education issued by EU (2017); Recommendation on the Ethics of Artificial Intelligence issued by UNESCO (2021)). In the digital era, persuasive and pervasive technologies and systems including, for example, the internet, big data, artificial intelligence, blockchain, metaverse, and robotics are bringing increasing numbers of challenges to the complex and multifaceted reality. Therefore, it is important for us to be prudent in human-human, human-technology, and technology-technology relationships based on our understanding of ethics. In the fast-changing world with ever-increasing digitization, people need to possess ethical and meta-ethical competencies, which could be developed by teaching and learning ethical literacy.

Generally, the widespread transition from traditional classrooms to blended and/or e-learning in teaching also affected ethics education, which was mostly facilitated by the search for more effective methods, pandemic conditions, and the development of technology (Jaganjac et al. 2023). There are common concerns about traditional pedagogical approaches for teaching ethics knowledge regarding such as cultivating problem-solving skills when facing ethical dilemmas (Sadowski et al. 2013), improving emotional regulation in complex ethical situations and bringing real-world experience of ethical decisions (Seager et al. 2010). Nowadays, information systems have been designed and widely used in ethics education and training which can enrich the learning content and interactive experiences. Gamification as the representative motivational IS approach (Koivisto and Hamari 2019) is becoming an emerging trend in contemporary ethics education. It can bring learners a game-like learning experience in acquiring, analyzing, utilizing, and sharing the knowledge of ethics (Schrier 2019; Staines et al. 2019). Gamification evolving from serious games has combined diverse formats and modes, ranging from traditional classroom games to video games, and from gameful experiences provided by specific game elements to wearable gaming technology (Xi et al. 2023) and virtual experiences in metaverse (Chen et al. 2023). However, games, especially commercial video ones, often have led to criticism and discussions on issues of educational strength, especially if gameplay contains, for example, seemingly unethical and immoral acts and behavior of characters (Ostritsch 2017; Schulzke 2010). Given the long history of games, ethics, and education, it is no doubt that there is a large body of literature on games and gamification in ethics education. However, to our knowledge, the literature on gamification studies for ethics learning has not yet been synthesized, and what remains unknown is **a) how gamification research for ethics education has been conducted; more specifically, what kinds of research methods and theories have been adopted; b) what gamification forms and features and what aspects of ethics learning have been empirically examined; c) whether and how gamification would influence ethics learning.**

Therefore, the aim of the current study is to gain a holistic understanding and examine the extant empirical literature on how gamification approaches are employed for ethics learning. To be more specific, the study analyses existing research design (incl. methods, theoretical foundations, context, and main characteristics), features of gamified interventions and main effects of gamification on ethics learning through a systematic literature review approach. This approach implies rigorously identifying, retrieving, and reviewing the existing empirical literature exploring and investigating gamification in ethics education (N=101). The results contribute to the interdisciplinary fields of information systems, education, and ethics and to practitioners such as game designers, educators, parents, and managers by providing an in-depth understanding of utilizing gamification for ethics and highlighting current gaps and opportunities for new research avenues. The paper is structured into five sections, including the background of ethics education as well as gamification, the review method and process, the synthesis of the findings, the discussion including future agendas, and conclusions with limitations.

## 2 Background

### 2.1 Ethics Education

While ethical perceptions, acceptance of ethical norms and attitudes towards harmful behaviors and practices may vary depending on culture, time, social aspirations, and other factors, and are often at the heart of ethical discourse at a certain time, ethics poses a much stronger and broader foundation on which all human activities are defined. Ethics seems to be a complex concept, and it is suggested to consider its definition from the baseline. Ethics is the study and philosophy of human conduct with emphasis on the determination about “right” and “wrong” (Frankena 1973). For this research, the notions “ethics” and “morality” are interchangeable, even though some people believe that morality is something internal and personal that follows internal principles, whereas ethics is social and interpersonal, and follows generally accepted norms and rules (Bagus et al. 2021; Moriarty 2021). There are mainly four different branches of ethics including normative (exploring what is “right” and “wrong”), meta- (the nature of moral thinking and language), applied (in different fields), and descriptive ethics (the cause-effect relationships in human behavior regarding moral issues and moral development) (Frankena 1973; Moriarty 2021).

A significant contribution to the descriptive ethics and psychology of morality was made by Rest (1986), who proposed the Four-Component Model of moral development. This model portrays four basic psychological processes, involved in the generation of behaving morally. These four components are moral awareness (ability to interpret the situation), moral judgment (reasoning which course of action is morally good, or right), moral motivation (priority to morality above other values), and moral action and self-regulation (possession of skills to behave morally). Based on the Four-Component Model, Narvaez (2006) suggested the Integrative Ethical Education Model as a foundation for ethical education, which consists of four competencies: ethical sensitivity, ethical judgment, ethical focus, and ethical action. Narvaez’s model aims to develop the ethical expertise of learners (i.e., from novice to expert level) in transformative and integrative environments to meet cooperative and self-actualizing human needs. Furthermore, according to Bandura’s social-cognitive theory (2001, 2006), the ability to behave morally can be learned, which means that, despite the already established inherent or acquired ethical beliefs, people can consciously approach the process of understanding ethics and deliberately apply this understanding into practice. If behaving morally is seen as a contextual process (Moriarty 2021), the main goal of this education is to learn how to become aware of ethical issues, how to have a set of thinking concepts over these issues and to have the ability to implement them to each own unique situation. This approach is different from the one usually used in the form of a ready-made model or instructions for what exactly to think and do in specific situations and can be achieved through an experiential active learning perspective. This perspective includes the following pedagogical tools for ethical education such as experimental learning, case studies, inviting guest speakers, collaborative learning, joint team projects, simulation, and gamification (Jaganjac et al. 2023).

### 2.2 Gamification

The idea of games as the pedagogical method is not new since game techniques have been used for learning starting from early childhood. Traditionally, gamification has been identified as the use of game elements in non-game contexts starting from the year 2011 (Deterding et al. 2011) and differentiated from serious and simulation games (Landers 2014). In the past decade, scholars have gradually reached a consensus that gamification, as one of the persuasive techniques, can bring game-like and gameful experiences to users in various non-game contexts by providing motivational values (Koivisto and Hamari 2019; Xi and Hamari 2019). The more recent holistic view held by Hamari (2019) refers to gamification as technological, economic, cultural, and societal developments in which reality is becoming more gameful. Gamification is often intentionally applied to different systems, activities, organizational structures, and, for example, education for them to provide similar positive experiences as games do with the assumption that they can help in the positive growth of motivation, attitudes, and behaviors. In the present study, the holistic view is adopted, and gamification is considered as the umbrella concept consisting of diverse kinds of game-related approaches, including games, gaming systems and platforms, gaming technologies, individual game elements, and mechanics.

The value of gamification lies in the fact that due to given content, certain combinations of elements and mechanics, it can afford a particular gaming experience for the player (Koivisto and Hamari 2019). One of the models that explores gamification elements is the Octalysis framework (Yu-kai Chou 2019). This framework describes eight core drives of gamification for players’ psychological motivation. It is usually presented in the clockwise format starting with the top: epic meaning, empowerment of creativity, social influence and relatedness, unpredictability and curiosity, avoidance and loss, scarcity and impatience,

ownership and possession, development, and accomplishment. Based on this framework, the drivers that provoke social interaction, creativity, and self-expression (from the right side of the clock) are related to intrinsic motivation. The drivers that make sense of logic, accomplishment, calculations, and possession (from the left side) belong to extrinsic motivators. Moreover, the techniques that encourage players to master skills, give a sense of meaning and feel powerful, and foster creativity (top side) belong to the “White Hat Gamification”. Conversely, “Black Hat Gamification” techniques (bottom side) motivate to avoid unfavorable feelings and uncontrolled states.

In the field of education, gamification has been seen as a promising approach as it could employ motivational affordances in the learning process (Majuri et al. 2018). Prior studies indicated that gamification has significant effects on, for example, driving intrinsic motivation, enhancing engagement, satisfying psychological needs, increasing learning achievement, and efficacy, and strengthening social connection (Legaki et al. 2020; Xi and Hamari 2019; Zainuddin et al. 2020). However, the relationship between gamification and ethics learning is complex and sometimes contradictory which leads to uncertainty regarding the effect of gamification on the success of ethics education. On the one hand, games have been considered moral educators given that it is a safe space (Staines et al. 2019) where players could learn to produce and imitate desirable behavior by practising social interaction (Khoo 2012), which leads to enhanced ethical thinking and moral-related skills (Schrier 2015). On the other hand, games may accelerate and cause more unethical behaviors such as being offensive and violent as a result of being influenced by the proteus effect (Huang-Isherwood and Peña 2021) increasing aggression and addiction and decreasing empathy and prosocial behavior (Khoo 2012), or even could cause emotional disorders (Li et al. 2021).

### 3 The Review Method and Procedure

This study employs the systematic literature review as “an effective method in synthesizing what the collection of studies are showing in a particular question and can provide evidence of the effect that can inform practice” (Snyder 2019, p. 334). This method is appropriate for this study because it can address specific research questions in a rigorous, objective, transparent, unbiased, and replicable way compared to other approaches (Boell and Cecez-Kecmanovic 2015). Accordingly, it has strict requirements for the search strategy and transparent inclusion and exclusion criteria for selecting papers. The search of existing literature was conducted in the Scopus database, the largest and most comprehensive repository of academic literature citation and abstract databases of peer-reviewed literature, including articles, books, and conference proceedings. Scopus is a high-quality data source, which provides a comprehensive overview of the world's research results in multidisciplinary fields and contains data from scientific worldwide publishers with support for large-scale analyses and data availability for researchers (Baas et al. 2020) as well as encompasses most papers included in other databases, for example, IEEE, Springer. We limited our search to only one database as using multiple databases can complicate the systematic process due to different structures and interfaces for searching strings, which can lead to inconsistency and potential errors. The systematicity of the search should not be confused with exhaustiveness, rather it refers to the transparency, clarity and rigor of the search strategy using a consistent approach (Paré et al. 2016).

Three core domains of interest comprise the basis of the search string: *gamification*, *ethics*, and *education*. Synonyms for these concepts were generated by brainstorming, and the search query string was finally formed: TITLE-ABS-KEY (gamif\* OR game\*) AND TITLE-ABS-KEY (ethic\* OR moral\* OR virtue\* OR civi\*) AND TITLE-ABS-KEY (educat\* OR learn\* OR train\* OR session\* OR self-regul\* OR self-contr\* OR “executive function” OR self-manag\* OR knowledg\* OR pedagog\* OR literac\* OR skill\* OR competenc\* OR teach\*). Additionally, the string was limited by document types (“Article”, “Conference paper”, “Book chapter”) that cover all peer-reviewed full papers and language (“English”). The search was conducted on August 31, 2022, yielding 2691 papers. Figure 1 displays the selecting papers process for the literature review with inclusion and exclusion criteria. Moreover, the procedure of backward and forward citation in one-round searching was performed, which resulted in 7 additional papers. The final number of analyzed papers was 101 ([list of reviewed papers](#)).

As there are no strict rules and consensus on how to appraise the quality of selected papers for the review (Xiao and Watson 2019), our research team jointly decided to adhere to the following procedure: one researcher transparently documented all selected papers in an Excel spreadsheet with explanatory notes in open access and made the full texts available for the whole group for the data curation. In accordance with the agreed criteria and logic, other researchers selectively checked the quality of the papers beyond those that the first researcher had doubts about. As a result, cross and double-quality checks were done. The following section reports the key findings based on research design, gamification features, and the main effects of gamification on ethics learning. For clearly presenting quantified information, the

calculation of frequency (freq.) in data-gathering methods, theoretical foundations, ethics characteristics, and results shows how many papers include selected items. The frequency of game elements contains the number of items met in all observed games. The remaining calculation is based on the number of reviewed papers.

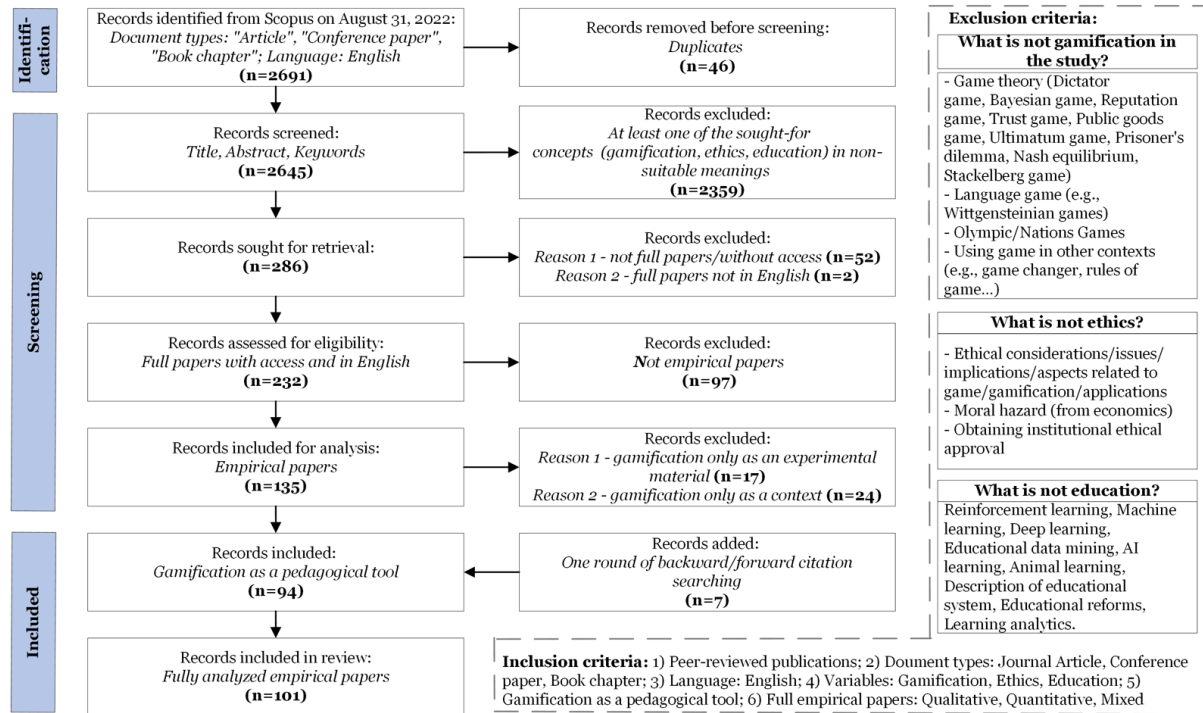


Figure 1: Flowchart Describing the Literature Review Process

## 4 Findings: Synthesis of the Literature

### 4.1 Publication Information

Our first research question aims to understand the research design applied to the explored field. The interest in the study of gamification for ethics education has increased in the last decade (Figure 2) and continues to gain momentum, which is consistent with gamification research in general (Koivisto and Hamari 2019; Zainuddin et al. 2020). Most papers (n=61) were published in academic journals, followed by conferences (n=37) and book chapters (n=3). The scope of journals and conferences has been represented by 54 and 22 publishing venues accordingly. The high number of publication venues shows the multilateral nature of the study topic. Most research are concentrated in social (40%), computer sciences (16%), engineering (12%), and business fields (11%) based on the Scopus classification of domains. In recent years, the growth of journal publications has become significant, which, apparently, can show more comprehensive, in-depth, completed papers that are not limited in length and discussions rather than work in progress or preliminary studies that are frequently presented in conferences.

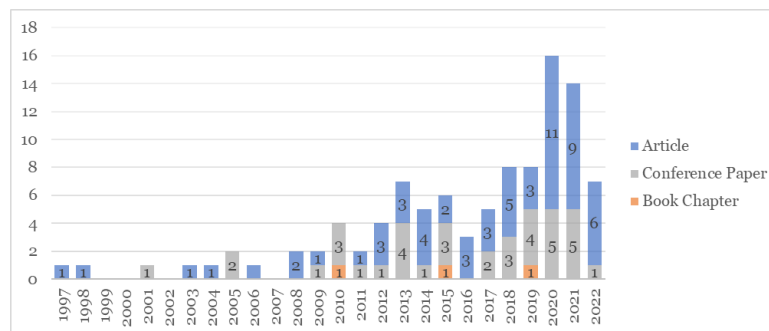


Figure 2: Number of Reviewed Papers per Year

## 4.2 Research Method

More than half of the reviewed papers employed a mixed research method (n=57), which comprises a blend of design, quantitative and qualitative approaches in various combinations. Nonetheless, separate methods, such as qualitative (n=22) or quantitative (n=22), appear in equal proportions in the remaining studies. The most frequently used techniques for data collection were surveys or questionnaires (n=66), techniques for gathering opinions and interpretations (n=57), for instance, interviews, discussion, narration, implementation, or prototype evaluation (n=45), and observation (n=43). Experiments were conducted in only 20 papers. The number of papers that contain qualitative methods is 68, while the total number of papers that use quantitative methods is 59. This finding attracts special attention since qualitative research comes to the fore. This contrasts with recent empirical review studies on the impact of gamification on learning (Zainuddin et al. 2020) and in general research on gamification (Koivisto and Hamari 2019), where the bulk of the research was based on quantitative methods. However, the widespread use of qualitative methods is characteristic of research in the social and related sciences, where a considerable number of reviewed papers have been published.

Overall, the research related to using gamification for ethics education were conducted in 32 countries with a predominantly share of tertiary students (51%), followed by K-12 students (25%), academic personnel (5%) and others. Minor categories such as players, preschool children, parents, blind persons, and disaster volunteers were invited to participate in research in several papers. Sample sizes varied from 2 to 504 participants. There was no indication of the number of participants in the 9 papers. Moreover, the gender of participants was mentioned only in 39 out of 101 papers. Nationality and cultural affiliation were also considered only in a few papers. The qualitative analysis of the context in the reviewed papers shows that studies were conducted in the field of engineering ethics (n=18), business ethics (n=17), education settings (n=17), environmental ethics (n=10), research and science ethics (n=8), public ethics (n=7), biomedical ethics (n=6), professional ethics (n=6) and other areas.

## 4.3 Theories, Models and Frameworks

The analysis of theoretical foundation indicates that approximately 40 papers do not explicitly refer to any theoretical basis in their research. However, the remaining papers include a variety of theoretical bases, which could be grouped into four large categories through three chosen variables (ethics, education/learning, and gamification) in the systematic literature review logic: ethics-related (n=35), game- or technology-related (n=20), learning-related (n=30), and other (n=19). It should also be noted that most of the papers without underlying theories employed qualitative research methods, separately or within the mixed approach. The most frequent normative ethical theories in the analyzed papers were Deontology, Utilitarianism, and Value-Based Approach, which use game-learning techniques to form ethical conduct in accordance with specific philosophical perspectives on what is right or wrong. Kohlberg's and Rest's Moral Development Theories as the representatives of descriptive ethics were mostly adopted in order to investigate moral reasoning level and its association with other variables. From the side of game design and technology evaluation, some authors utilized Technology Acceptance Model, Transformational Play Concept, Non-Cooperative Game Pedagogical Theory, and other approaches. From a learning-related perspective, Dialogue Socratic Method, Design Thinking and Participatory Design, Kolb Learning Cycle, Social Cognitive Theory, and others were used for the creation of a successful learning environment. Additionally, the researchers applied other theoretical content related to cultural, economic, social, and psychological aspects such as Freiman's Theory of Improvisation, Roger's Adoption Theory, Leader-Member Exchange Theory, and others.

## 4.4 Forms of Gamification

To address how different forms and features of gamification have been implemented for ethics learning, we extracted the descriptions of 69 standalone games (Appendix 1) used for ethics education improvement, which are mentioned in 92 reviewed papers. The remaining 9 papers either described individual game elements (for example, points or role-playing improvisation) or used several games without going deep into the description of each or did not indicate the name and characteristics of the games at all. Hence, to conduct a comprehensive systematic analysis of separate games, these papers were excluded. We employed and combined two approaches for game analysis: a description of the game in the text of publications and an independent walk-through of the game if it is available for public use.

*Games formats.* The majority of the analyzed games (n = 45) were played on computer, mobile, tablet devices, or other digital technologies. Nine of them are 3D PC games, which create a more immersive, dynamic, and realistic environment for visual users' perception. Three games have been identified that use VR headsets or VR cardboard, which, in addition to visual perception, also connect the perception of movement and a sense of space for the player. Nine games simultaneously used the digital and

analogue forms or available in two versions. These games are usually complicated in terms of implementation and facilitation, therefore all of them are designed directly by researchers. The rest of the games are classroom games, using either boards and cards or other social playing activities.

*Single vs. multiplayer mode and gaming duration.* Looking at the type of use, purely digital games are commonly oriented toward single participants (26 games are single-player, 3 for multiplayer, and 6 for any type of playing, with no data for 1 game). The opposite situation is observed in analogue and in both formats' games, where almost all games (except 1 game) are aimed at social interaction and multiple playing. Games in the reviewed publications are varied based on the duration of the game or activity. A feature of games that use some technologies refers to the possibility of using them for short-term tasks (5 games with a gameplay period of 10-15 minutes), for hourly and daily activities (19 games), and for long-term goals (11 course-length games). The analogue classroom games (19 games) are mainly used for one-time activity (but not less than 15 minutes) and do not involve more than one working day (only 1 course-length game). For the 14 games, the duration data was not available.

*Game elements.* Researchers rarely analyzed individual game affordance, much less defined their impact on ethical learning outcomes. They mainly answered questions of a more general level on the recommendations of using a gamified approach overall without going into details. To set a starting point in this direction, an attempt to characterize games for ethical learning through their elements was undertaken. To classify game elements, the choice was made in favor of the Octalysis framework because it is becoming widely known not only in practical application (Yu-kai Chou 2019) but also in the scientific community (Behl and Dutta 2020; Reyes et al. 2021; Yang et al. 2023). In the analysis of all 69 games (Table 1), the most significant drivers in terms of the number of elements included and the frequency of mention of these elements in games are development and accomplishment, empowerment of creativity, social influence, and epic meaning. In accordance with the interpretations of this approach, these drivers are considered "White Hat Gamification", which provides positive motivations and creates feelings of powerfulness and inspiration. While considering each game element separately, the triad of the most frequently encountered elements consists of storytelling/narrative, roles, and choice perception, followed by points and feedback on accomplishment. Drives such as avoidance and loss, scarcity, and unpredictability that belong to negative motivators, as well as ownership and possession, which are strongly connected with extrinsic stimuli are utilized less often in games for ethics education.

Elements	Freq.	Elements (Continue)	Freq.
<b>Development&amp;Accomplishment</b>	<b>181</b>	Conflicting Requirements	15
Points/Score	37	Sharing Points/Cards/Goods	7
Feedback on Accomplishment	35	Collective Discussion before Individ. Choice	5
Levels/Stages/Rounds/Stations	31	Collective Voting	3
Selecting Correct Answer/Assessment/Quiz	20	No Communication between Teams	3
Quests/Mission	17	Peer Feedback	3
Collecting Information	15	Social Pressure	2
Performance Pressure	9	Chats	1
Prize/Reward	6	<b>Epic Meaning</b>	<b>101</b>
Collecting Items	5	Storytelling/Narrative	54
Leaderboard	3	Roles	43
Progress Bar	1	No Winner or Loser/No Losing Conditions	3
Boss/Final Fight	1	Epic Meaning	1
Upgrading Skills	1	<b>Unpredictability &amp;Curiosity</b>	<b>36</b>
<b>Empowerment of Creativity</b>	<b>121</b>	Randomness	14
Choice Perception	38	Unexpected Element/Event Card	11
Moderator/Facilitator	18	Bonuses/ "Chance" Squares	11
Prompts	16	<b>Scarcity&amp;Impatience</b>	<b>34</b>
Meaningful Choices	15	Time Pressure	16
Limited Rules/Creating Own Rules	9	Limited or Differences in Resources	15
Creating New Scenarios	7	Breaks in Game	3
Feedback to Encourage	7	<b>Ownership&amp;Possession</b>	<b>32</b>
Milestones Unlock	5	Avatar/Selecting a Character	13
No Ideal Solutions/No Right Answer	4	Exchangeable Points	7
Improvisation	1	Build-From-Scratch	6
Fantasy Element	1	Virtual Goods	5
<b>Social Influence and Relatedness</b>	<b>121</b>	Protector Quest	1
Collaboration in Teams/Pairs	31	<b>Avoidance and Loss</b>	<b>20</b>
Competition	27	Avoidance/Loss of Something	15
Dialogue/Interaction with NPC	24	Punishment	5

Table 1. Game Elements' Classification



## 4.5 Aspects of Ethics Learning

Most of the publications aimed at assessing the use of games or game technologies in ethical learning. Seventy-six papers evaluated the perception, user experience, adaptation, and acceptance of certain game interventions. A total of 63 papers were devoted to ethical characteristics. The ethics-related category of exploring the effect of gamification on the success of ethics education is based on the Integrative Ethical Education Model (i.e., ethical sensitivity, judgment, focus, and action) with the addition of a general category related to ethical skills (Table 2). Thirty-six papers aimed to evaluate learning processes and outcomes. Although some studies have not drawn a clear distinction between cognitive abilities and moral reasoning, as these concepts are intertwined in some sense, the learning-related category includes studies that, for example, have led to knowledge tests and not focus on moral decision-making. About 20% of the reviewed publications have studied other non-ethical, learning, and technological attributes, such as effects and emotions, planned behavior, parental styles, self-efficacy, and others.

Type	Freq.	Description and Examples
Ethical Sensitivity	21	The ability to interpret ethical situations. For example, this type could include the following aspects: perspective-taking on complex ethical issues; awareness of ethical principles and dilemmas; changes in ethical awareness; fostering moral sensitivity; identifying and recognizing ethical issues.
Ethical Judgment	32	The ability to make a judgment/reasoning about which course of action is morally right (or fair, or morally good). For example, this type could include the following aspects: level of moral reasoning; critical ethical thinking; justification and argumentation of ethical issues; moral deliberation; understanding of moral dilemmas; intuitive moral decisions.
Ethical Focus	9	The ability to prioritize moral values above other personal values. For example, this type could include the following aspects: value recognition; moral values and societal rules, moral principles, value orientation from self-interest toward the interest of others; the importance of ethics; inherent moral foundations.
Ethical Action	4	The ability to possess skills and competencies to behave morally. For example, this type could include the following aspects: commitment to moral action; fair play; player's ethical conduct within the game.
General Ethical Skills	14	The aggregate category describes ethical competencies and skills in general without division by separate processes. For example, this type could include the following aspects: moral identity; ethical decision-making skills and processes; ethical efficacy; ethical profile.

Table 2. Ethical Characteristics in Reviewed Papers

## 4.6 Results: Effects of Gamification on Ethics Learning

### 4.6.1 Main Effects

To answer the research question attached to the effects of implementing gamification in ethics education, we synthesized the results presenting by core ethical characteristics and types of effect (positive, mixed with positive, null, mixed with negative, and negative) (Table 3). This table does not include results regarding other factors influencing the effect of gamification, because findings are primarily descriptive. Findings identify, for example, differences and similarities, and do not show the positive or negative vector of influence on how gamification could be used for moral development. In addition, results regarding the acceptance and adoption of technology and integration into the pedagogical curriculum were out of scope in the current synthesis.

Characteristics	Type of Results, Frequency				
	Positive	Mixed with Positive	Null	Mixed with Negative	Negative
Ethics Sensitivity	15	1	1	-	-
Ethics Judgment	23	4	2	-	1
Ethics Focus	4	1	-	-	1
Ethics Actions	4	-	-	-	-
General Ethical Skills	4	1	-	-	-

Table 3. Effects of Gamification on Ethics Characteristics

The general picture, emerging from the review analysis of outcomes, is that the extracted results of implementing gamification for ethics education are mostly positive. 23 papers concluded that using the gamified approach for ethics education could provoke thoughts, facilitate reflective and argumentative thinking, contribute to moral reasoning performance, and increase consciousness (e.g., Haywood and Wygal 2009; Svingby 2013). It provides a safe, low-risk environment for integrating and presenting abstract ill-defined content of ethical considerations in specific more perceptible, and tangible settings (e.g., Hodhod et al. 2011; Stransky et al. 2021). Gamification seems to effectively prompt perspective-taking, raise awareness about ethical issues, significantly increase attitude toward ethics, skill at identifying ethical dilemmas and foster moral sensitivity (e.g., Lloyd and van de Poel 2008; Maddineshat et al. 2019; Shilton et al. 2020; Skinner et al. 2019), which was confirmed in 15 publications. Playing in such games allows one to feel ethical concepts, establish appropriate moral values (e.g., Lloyd and van de Poel 2008; Sutrop 2015; Wright et al. 2020), experimentally try various forms of persuasion and agreement (e.g., Seager et al. 2010), provide opportunities for self-expression and self-examination (e.g., in Gjørnum and Ramsdal 2015; Rush 2014), produce more realistic behavior responses (e.g., Stransky et al. 2021), and experience a sense of remorse regarding lack of compliance (e.g., Flintham et al. 2020) and moral identity crisis (e.g., Sadowski et al. 2013), which could be the suitable time for teaching moments. Moreover, this approach could be beneficial for education as it increases creativity, and group tacit knowledge, develops social-emotional skills, and improves knowledge about applied ethics and overall learning performance.

Despite the overall positive outcomes of gamification intervention for ethics learning, some challenges in this field have already been identified. Sometimes players do not engage with moral content in games but deliberately conduct unethical actions to win or to have fun (Briggle et al. 2016; Buck 2012). Additionally, more experienced gamers may have different attitudes towards morality in games and in real life (Svingby 2010). A few studies provided mixed, neutral or even negative results of gamified interventions for ethics learning, which mainly related to insignificant differences in ethical awareness after the intervention (Edelson et al. 2021), a failed attempt using a game without guiding feedback (as real-world consequences provide in real life) (Nel and Carroll 2017), incorporating prosocial nudges and self-reflection elements that decreased the learning outcome in some cases (Tanner et al. 2022), and lack of the effect of the moral game on trust (Fukuyama and Morita 2013). Moreover, some commercial games could not activate enough moral emotions and reasoning without thorough design and facilitation (Cabellos et al. 2022).

#### **4.6.2 Boundary Conditions**

In addition to synthesizing the results regarding the effect of gamification on five different dimensions of ethics learning, this literature review also explores the potential boundary conditions of employing gamification in the context of ethics education. Based on the findings from 9 review studies, demographic factors especially gender, and individual factors such as cultural background and learning styles have been examined to have significant moderating effects.

To be more specific, female learners were observed to show high empathy towards game characters (da Silva 2021), have high knowledge gain (Xenos and Velli 2020) and perceive such games as more usable (Evangelou et al. 2021). Male students show more interest and motivation in adopting gamification for learning ethics (Siala et al. 2020). However, experienced male players do not fully use the opportunity of retrieving information and discussion regarding ethics (Svingby 2010). Conversely, Jagger with colleagues (2016) argued that appreciation of ethics games as a learning tools is not affected by gender. Additionally, playing games with different gender avatars does not appear to effect most ethical decision-making skills (Schrier 2012). Cultural differences also play important roles in moderating the effect of gamification. In the study of Siala et al. (2020), learners from low-uncertainty cultures easily adopt ethical games as a learning tool, rather than users from high-uncertainty cultures. For learners who possess an active learning style, the quality and accessibility of VR technology have a significant positive effect on their ethical self-efficacy (Sari et al. 2021). Participants' willingness to play moral game is significantly influenced by subjective norms, self-esteem, attitudes towards the game, control of behavior and parenting style (Hong et al. 2011).

Two studies explored the learners' motivation towards using game-based learning approaches for ethics education and identified a niche in order to fill the gap between experts' and novices' knowledge and skills (Wahyudin et al. 2013) and overcome the unsatisfaction of traditional tools to teach ethics (Zahrani et al. 2019). A few publications elucidated deep qualitative insights into developing players-learners typology during gameplay (types: essentialising-generalising, relationing-relativising and indifferent-mercurial) (Hofmann 2021) and shed light on aspects of moral decision-making in gameplay such as

learners' dispositions towards, familiarity with game genre, comparison with real settings, role of empathy and emotions, consequences for game characters (da Silva 2021).

## 5 Discussion and Recommendations for Future Work

The findings of this study present the diversity of using different research methods with versatile theories, investigating various ethical characteristics, and applying different interventions to identify gamification's impact on ethics education, which is mainly claimed to be positive. Based on these important findings, we further propose seven important future agendas for researchers to investigate, from the perspectives of research method, adopted theories and research theme.

*Future researchers are encouraged to design and conduct experiment-based methods (e.g., laboratory, online, field experiments) to compare and examine how different forms, elements and characteristics of gamification would influence the learning of ethics (Agenda 1).* As described in section 4.2, only 20 papers adopted the experiment method to examine the effectiveness of gamification in ethics learning; the survey method seems to be the dominant research method. By surveying users, researchers often can obtain knowledge regarding participants' general attitudes and perceptions towards the features and characteristics of specific game/gamification systems and whether they are significantly correlated with learning consequences. While experiments can indicate cause and effect relationships in the relatively controlled learning environment especially for the comparison between the effects of different gamification elements or game-based systems; meanwhile, providing evidence with relatively high internal validity (Fraenkel et al. 2011). More importantly, experimental settings can provide users with the opportunity to acquire a first-hand experience of using gamification-based learning systems or approaches since it would be difficult for the user to simply imagine the experience as is often the case in survey.

*In order to improve the rigor of research methodology and robustness of findings, future studies may consider diversifying the sample regarding individual characteristics and increasing the sample size (Agenda 2).* Even though studies were conducted in 32 countries and sample sizes in the reviewed literature varied from 2 to 504 participants, more than half of the papers did not present a detailed exploration of subjects' individual characteristics (e.g., gender, cultural and educational background). Additionally, attracting a professional category, especially in such areas as business, engineering, environmental, and biomedical ethics, whose perceptions may differ from students' responses who were usually participants in the literature corpus, is underestimated.

*In order to develop the conceptual and research framework to examine the role of gamification on learning, future researchers may consider theories related to self-efficacy such as intrinsic/extrinsic motivation, goal settings, gameful experiences and social-related theories such as social exchange and support (Agenda 3).* Despite the variety of theoretical bases, extant literature mostly focuses on traditional ethical theories, learning-related theories, game design-oriented and technology-adopted theories. Only one study employs Flow Theory (Raphael et al. 2012), and there is no evidence of the use of Self-Determination Theory or Goal-Setting Theory, which represents the most frequently used triad for exploring gamification impact on learning (Zainuddin et al. 2020). Further, the application of social-oriented theories is still limited in the research field. Two studies use Social Cognitive Theory (Huang and Ho 2018; Sholihin et al. 2020) and one study employs Leader-Member Exchange Theory (Ross et al. 2017).

*Future researchers are encouraged to conduct a more granular analysis of the effect of gamification elements (in addition to the games or gameful ISs) on ethics learning (Agenda 4).* Even though the used gamification elements are presented in Table 1, the extant studies have not thoroughly examined the effects of these elements on different aspects of ethical learning. The research mainstream is limited to the effectiveness of employing game-based learning systems (n = 69). Therefore, it is still unclear whether these specific elements can also be effective, positive, and motivational in influencing learning experiences, processes, and behaviors in ethics education.

*Future researchers are suggested to explore whether and how gamification can be employed to help users and learners internalize, apply and transfer ethics knowledge to ethical decision-making skills in real-life settings (Agenda 5).* The ethical characteristics analysis shows that most previous investigations aimed to assess moral judgment and sensitivity rather than evaluate actions or convert ethical perceptions to ethical behavior. However, ethical conduct is more impactful in society because concrete actions and behavior are perceptible and visible to others (Aura et al. 2022; Rest 1986). Although many games use real-life scenarios and imitation of true choice perception, the game itself is perceived by players as stimulation which only confronts them with imaginary moral dilemmas that they

are not facing right now in real life, and such ethical lessons can remain at a level of theory (Buck 2012; da Silva 2021). Additionally, the general trend of the reviewed papers shows that short-term interventions of gamification have mostly been investigated (only 12 papers explored course-length games), which could not be enough to measure behavioral changes, which require a systematic, iterative execution and practice (Hartman 2002).

*We encourage researchers to delve deeper into exploring the implementation of gamification, which could induce negative and unexpected consequences (e.g., moral crisis, negative emotions, remorse) with circumspect and prudent facilitation, that could be beneficial for ethics literacy (Agenda 6).* Often games, especially virtual ones, are the subject of a major discourse that they may contain calls for players to do immoral things (Ostritsch 2017; Young 2017), which causes the gamer's dilemma (Luck 2009). In addition to the gamer's dilemma, the player may experience negative emotions and moral crises while playing games. As seen in the results, moral identity crises and remorse may encourage participants to reflect on their own understanding of ethics, which may be useful for ethics education (e.g., Boyack and Berman 1997; Cabellos et al. 2022; Flintham et al. 2020; Sadowski et al. 2013).

*Future researchers are suggested to investigate how a gamification-based approach to ethics education integrates within the broader pedagogical curriculum (Agenda 7).* The use of gamification for ethics education is mainly focused on short-term intervention, rather than embedding a game-based learning approach during long-term design, for example, course length. While among digital games for ethical teaching, it is still possible to find 2-week use games, among purely analogue games this is more difficult to do. However, repetitive practice of the same games can reduce student interest and motivation (Hong et al., 2016). Therefore, a few educators and researchers have found a way out by combining and alternating several games to get a positive effect (e.g., Edelson et al., 2021; Kabilan, 2022; Maddineshat et al., 2019). However, there is still no clear understanding of how and in what sequence game approaches and games for ethics should be integrated and combined in the design of the pedagogical plan.

## 6 Conclusion and Limitations

This study provides essential contributions for practitioners and researchers in the fields of education, ethics, and motivational information systems as it presents a comprehensive assessment of the status of gamification for ethics education through a systematic review of extant empirical literature. By reviewing 101 papers, key features of how game-based learning approaches for ethic literacy have been synthesized, considering research design, games interventions, and results of main effects. Based on the synthesized findings, seven important future agendas have been proposed. The study shows that research in this field has seen considerable growth over the last decade. Gamification in ethics education is utilized in various fields with mostly positive outcomes.

The study has a few limitations. For example, the initial search was confined to a Scopus<sup>1</sup> database and only to English. However, using one database made it possible to avoid inconsistencies and possible errors of various structures and interfaces of searching strings in several databases, some publications may be missed. Therefore, future research could consider using additional databases such as Web of Science, EBSCO, and Google Scholar. To mitigate these risks additional backward and forward citation searching was executed in this study. In addition, the scope of the research may lack publications on distinct elements of ethical learning pedagogy that may be somewhat consistent with the gamified approach, such as role-playing. However, if the authors did not consider these elements as related to gamification or game-based learning, these studies are not of tangible value to the current study and are not included in the review.

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<sup>1</sup> Several papers in the high-ranked journals were identified, that used Scopus as a single database for systematic literature review in the field of education, decision-making, business, and gamification (Acciarini et al. 2023; Morschheuser et al. 2017; Pérez-Sanagustín et al. 2017)

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## Appendix 1

Games investigated in the reviewed papers for ethics learning

# of Reviewed Paper	Standalone Game	Type of Development*	Type of Use**	Period of Gameplay	Game Format
1	The Doctor's Cure	SD	S	More 2 Weeks	3D PC Game
2	Serious Games to Teach Ethics to Young Children	SD	S	1 Day - 2 Weeks	Mobile/Tablet Game
3	Who Wants to Be an Ethical Engineer?	SD	M	15 Min - 1 Hour	Classroom Game
4, 12, 41	The Ethics Challenge	E	M	1-2 Hours	Classroom Board Game
5	Island Telecom	SD	M	N/A	Classroom Computer Game
6	The University Prosperity Game	SD	M	More 2 Weeks	Classroom Non-Video Game Using Computer
7	Grants and Researchers	SD	M	N/A	Classroom Card Game
8	Deepwater	SD	M	More 2 Weeks	Classroom Non-Video Game Using Computer
11	Papers, Please	E	S	N/A	Computer and Mobile Game
14	Internal Controls Game	SD	S	Less 15 Min	Computer Game
15, 16, 81	The Walking Dead	E	M	1 Day - 2 Weeks	Computer Game
17	CAVE - IVR (Immersive Virtual Reality)	SD	M	More 2 Weeks	VR Headset/Environment
18	Ethics against Chemistry	SD	M	2 Hours - 1 Day	Classroom Board Game
20	My Life as a Software Engineer	SD	S	15 Min - 1 Hour	Mobile/Tablet Game
21	The Corrupt Kitchen	SD	S	Less 15 Min	VR Headset/Environment
22	SNS (Social Network Service) EduGame	SD	S	N/A	Computer Game
23	Fragile Eden	SD	M	N/A	Classroom Card Game
25, 60	Forum Theatre	E	M	2 Hours - 1 Day	Classroom Game
27	The Desert Island Game	SD	M	N/A	Classroom Game
28	Research Ethics Jeopardy™	SD	M	1-2 Hours	Classroom Game
29	Android-Based Acoustic VR Game	SD	S	Less 15 Min	Mobile/Tablet Game
30, 31	The Ethics Bingo	SD	M	15 Min - 1 Hour	Classroom Board Game
32	RoadEthos	SD	S	15 Min - 1 Hour	Computer Game with Physical Devices (Car Wheel and Pedal)
33, 42	Quandary	E	S and M	15 Min - 1 Hour	Computer and Mobile Game
34, 35, 36, 37	AEINS - Adaptive Educational Interactive Narrative System	SD	S	More 2 Weeks	Computer Game
38	Trading Game	SD	M	1-2 Hours	Classroom Game
39, 40	To Do or Not to Do	SD	S and M	More 2 Weeks	Computer Game
43	Marketing Mayhem	SD	S	1-2 Hours	3D PC Game
45	BLOCKS	SD	M	15 Min - 1 Hour	Classroom Board Game
46	Information Ethics Simulation Game	SD	S	15 Min - 1 Hour	Computer Game
47	Delta Design	E	M	2 Hours - 1 Day	Classroom Board Game
48, 49	ADITHO - A Day In The HOspital	SD	S and M	15 Min - 1 Hour	3D PC Game
54	Emergency in Ethics	SD	M	1-2 Hours	Classroom Game
55, 26	Academical	SD	S	N/A	Computer Game
56	The Ethics Game	SD	M	1-2 Hours	Classroom Game
57	Legal Competence Didactic Game	SD	M	1 Day - 2 Weeks	Classroom Game
58	FDIA - First Day in Academe	SD	S	N/A	Computer Game
59, 60, 61	Shimpai Muvou ("Don't be Afraid")	SD	S	N/A	Computer Game
62	Primary Campaign Simulation	SD	M	1-2 Hours	Classroom Game
63	Global Conflicts: Sweatshops	E	S and M	15 Min - 1 Hour	Computer Game
64	Bioethics Game (Based on The American Dream)	SD	M	N/A	Classroom Board Game
65	LMX: The Game! (LMXTG)	SD	M	15 Min - 1 Hour	Classroom Board Game
66	Perry Library Land	SD	M	2 Hours - 1 Day	Classroom Board Game
67	The Solow game	SD	M	1-2 Hours	Classroom Non-Video Game Using Computer
67	The Intergenerational Equity game (Intergen)	SD	M	1-2 Hours	Classroom Non-Video Game Using Computer
67, 73	The Externalities Game	SD	M	1-2 Hours	Classroom Non-Video Game Using Computer
67, 80	The Tragedy of the Commons Games (Pisces)	SD	M	1-2 Hours	Classroom Non-Video Game Using Computer
68, 76	VR Auditor Game	SD	S	N/A	VR Headset/Box via Mobile App and Computer Game
69, 70, 71	Fable III	E	S and M	1 Day - 2 Weeks	Computer Game on Xbox 360 Console
72	The Experimento Game	SD	S	Less 15 Min	3D PC Game
74	ETGAR Game	E	S	N/A	Computer Game
75	Privacy by Design	SD	M	1-2 Hours	Classroom Computer and Board Game
77	Serious 3D Ethics Game	SD	S	2 Hours - 1 Day	3D PC Game
79	Unplugged Game	SD	M	1-2 Hours	Classroom Game
82, 83	CUP - Contents Under Pressure	SD	S	1 Day - 2 Weeks	Computer Game
84	Teachers' Values Game	SD	M	2 Hours - 1 Day	Classroom Board Game
85, 86	Men and Animals	SD	M	15 Min - 1 Hour	Computer Game
87	UFin: the Challenge	SD	S	15 Min - 1 Hour	Mobile/Tablet Game

88	Prototype of a Serious Game for SMR (Social Moral Reasoning)	SD	S	N/A	3D PC Game
89	The Peer Review Card Exchange Game	SD	M	1-2 Hours	Classroom Card Game
90	Online Simulation with Ethical Scenarios (in Articulate Storyline 360™ Platform)	SD	n/a	1-2 Hours	Computer Game
91	Serious War Game Simulation	SD	S	15 Min - 1 Hour	3D PC Game
92	Magnitude (Training Simulation)	SD	S	N/A	Mobile/Tablet Game
93	The Meaning Market	SD	M	15 Min - 1 Hour	Classroom Game
94	Customized Game (Based on Dungeons & Dragons™)	SD	M	2 Hours - 1 Day	Classroom Board Game
95	Ethics Game	SD	S	15 Min - 1 Hour	Mobile/Tablet Game
96	Pizzeria Story	SD	S	Less 15 Min	3D PC Game
98	Ethoshunt	SD	S and M	More 2 Weeks	Mobile/Tablet Game
100	The Virtual Sydney Rocks	SD	S	15 Min - 1 Hour	3D PC Game

\*Type of Development (E- Existing, SD – Self-Developed)

\*\*Type of Use (S – Single, M-Multiplayer)

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