Building player profiles for strategic analysis in higher education

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Abstract

This article is an original contribution to the development of analytical models applicable to higher education, focusing on the construction of player profiles based on strategic decisions in gamified contexts. The work falls within the field of educational gamification, proposing a conceptual and operational model to create an automated tool for identifying strategic player profiles, based on data collected through a structured questionnaire.

The proposal is based on the foundations of game theory, decision psychology and behavioural analysis, with the central objective of developing a methodology that allows players' strategic profiles to be drawn up in a personalised and automated way in simulated learning environments. The model classifies participants into four distinct profiles—competitive, cooperative, adaptive, and cautious—based on their behaviour when faced with strategic dilemmas.

As part of this article, a pilot test of the tool was conducted with a group of higher education students in the field of tourism, thereby validating the model in a real-world environment. The practical application demonstrated a high level of agreement between the profiles identified by the questionnaire and the behaviours observed later in simulated games, thereby reinforcing the reliability of the proposed methodology.

Based on these preliminary results, it can be concluded that the model is ready to be applied to broader and more diverse samples, including higher education institutions in other countries. Such an expansion will enable the model to be validated in various cultural and pedagogical contexts, thereby contributing to the consolidation of an innovative approach to diagnosing, personalising, and developing strategic skills in gamified educational environments.

Keywords: Education Simulations; Game Theory; Game-Based Learning; Gamification; Strategic Decision-Making.

1. Introduction

The use of simulations and games in higher education has taken on a central role in transforming traditional pedagogical practices. These interactive environments create realistic scenarios that promote active student engagement, enabling them to apply theoretical knowledge in dynamic and challenging contexts (Gee, 2003; Plass, Homer, & Kinzer, 2015). When applied in a structured manner, gamification fosters not only intrinsic motivation but also the development of transversal skills such as decision-making, uncertainty management, cooperation, and strategic thinking (Hamari et al., 2016).

At the same time, games and simulations serve a relevant analytical function by allowing for the automated collection of data during gameplay. This is made possible through mechanisms such as game telemetry and information trails, which enable the continuous and real-time recording of participants' actions, decisions, and behavioural patterns. These data, collected directly within digital environments, allow for a detailed analysis of the learning process, revealing trends associated with problem-solving, decision-making, and adaptation to complex contexts. In this way, games and simulations go beyond traditional approaches focused solely on

outcomes, offering a rich and dynamic view of students' performance progression over time (Loh, Sheng, & Ifenthaler, 2015).

In this context, the construction of player profiles emerges as a valuable tool for pedagogical diagnosis and personalisation. Through the analysis of in-game interactions—whether actions, choices, or strategies—it becomes possible to outline behavioural profiles that reflect cognitive traits such as impulsiveness, caution, adaptability, or social orientation. These profiles allow, on one hand, for the adaptation of pedagogical challenges to the student's style, promoting more effective learning; and on the other, provide the student with a mirror of their decision-making style, fostering self-awareness and metacognitive development (Loh & Li, 2016; Slater et al., 2022).

The relevance of this approach is particularly evident in fields such as tourism, management, economics, or international relations, where professional success involves decision-making under pressure, negotiation with multiple stakeholders, and adaptation to volatile contexts. For example, Yin (2020) demonstrates that a foreign investment negotiation simulation significantly enhances negotiation skills in international business courses; Kim and Prideaux (2006) use game theory to analyse how strategic decisions between South and North Korea, mediated through tourism, influence cooperation and conflict dynamics in the inter-Korean political context. Irrera (2021) demonstrates that simulations like Game of Peace enhance conflict resolution, while Sheng (2011) applies game theory to analyse sustainable competition between tourism destinations, showing that moderate strategies maximise regional benefits.

In sum, identifying player profiles based on gameplay data is not merely a classificatory exercise, but rather an integrative approach to pedagogical diagnosis, support for personalisation, and the development of skills crucial to today's professional world.

2. Literature Review

The identification of player profiles based on behavioural data has been increasingly employed in educational contexts to understand learning styles and enhance the effectiveness of pedagogical interventions. Various authors have contributed distinct methodological approaches, demonstrating the value of analysing decisions and interactions within games to delineate meaningful profiles.

Loh, Sheng, and Ifenthaler (2015) were pioneers in proposing the use of interaction data from educational games to distinguish behavioural profiles. By analysing navigation logs and decision-making patterns, they identified three main profiles:

- **Explorer**: a player who actively explores the game environment before making decisions;
- **Fulfiller**: a player focused on completing tasks and achieving defined goals;
- **Quitter**: a player who tends to abandon the game before completing it.

Their study showed that these profiles are associated with distinct learning patterns, with the Explorer profile demonstrating the highest performance in the cognitive tasks required by the game. The methodology combined similarity measures and sequential analysis of actions to differentiate patterns among players (Loh, Li, & Sheng, 2016).

Loh and Li (2016) further developed this approach by using what they termed GAD profiles (Gameplay Action-Decision) to prescribe individualised training paths in simulation environments. The study confirmed that associating behavioural profiles with personalised training strategies could significantly increase learning effectiveness and reduce training costs. For example, their work demonstrated that players with a Fulfiller profile benefit more from direct reinforcement and structured feedback, whereas Explorers learn better with autonomy and contextual exploration (Loh & Li, 2016).

Bicalho, Baffa, and Feijó (2019) applied data science methods to identify player profiles in gamified educational environments. Using K-means clustering algorithms and decision trees, the authors classified participants according to Bartle's classic model (1996), adapted to educational contexts:

- **Killers** (competitive),
- **Achievers** (goal-oriented),
- **Socialisers** (focused on interaction),
- **Explorers** (motivated by discovery).

The model achieved an accuracy rate of between 75% and 80% in predicting behaviours, revealing that the match between play style and task type directly affects engagement and academic outcomes (Bicalho, Baffa, & Feijó, 2019).

In turn, Mizrahi, Laufer, and Zuckerman (2020) focused on tacit coordination games, where players must align decisions without explicit communication. Through experimental testing, the authors identified cognitive-strategic profiles with a direct impact on the ability to predict others' actions. The study concluded that players with more flexible and cooperative styles were more successful in coordination tasks, highlighting the importance of individual strategic profiles in collective performance (Mizrahi, Laufer, & Zuckerman, 2020).

More recently, Slater et al. (2022) employed Latent Profile Analysis in a physics game to identify two main groups: high- and low-engagement players. These profiles effectively predicted learning outcomes, suggesting that behavioural engagement is a strong indicator for adapting educational support (Slater et al., 2022).

Aydin, Karal, and Nabiyev (2022) demonstrated, in a review of 26 studies, that effective educational games depend on the accurate identification of player profiles. The authors emphasised the use of neural networks and decision algorithms as key techniques for constructing these profiles, which have a direct impact on content adaptation and user experience (Aydin et al., 2022).

Lastly, Zare et al. (2022) confirmed, even in the context of artificial intelligence applied to competitive games (RoboCup), that anticipating opponents' decision-making patterns based on profiles significantly improves system performance. This conclusion reinforces the cross-disciplinary relevance of strategic profiling, even beyond educational contexts (Zare et al., 2022).

These contributions robustly demonstrate that establishing player profiles is crucial for understanding and predicting decision-making, informing pedagogical interventions, and tailoring game dynamics to diverse learning styles.

Recent literature has highlighted the importance of identifying player profiles as a means to understand and analyse decision-making processes in gamified educational environments. This approach enables the recognition of behavioural patterns, the adjustment of learning experiences, and the optimisation of student performance.

Loh, Sheng, and Ifenthaler (2015) proposed an analysis of players' interaction trajectories in digital environments, identifying three distinct profiles: Explorer, Fulfiller, and Quitter. These profiles reflect different cognitive styles, directly influencing engagement and performance. Later, Loh and Li (2018) developed the concept of GAD profiles (Gameplay Action-Decision) to prescribe personalised training, demonstrating that the prior identification of player profiles enables content adaptation, improved efficiency, and reduced intervention costs.

Bicalho, Baffa, and Feijó (2019) employed classification algorithms, including K-means and decision trees, to categorise players according to Bartle's model, demonstrating that behavioural data-based profile identification enhances the accuracy of behaviour and outcome predictions.

In a more recent study, Slater et al. (2022) applied Latent Profile Analysis to identify engagement profiles in an educational physics game, concluding that these profiles significantly predict post-game success. Aydin, Karal, and Nabiyev (2022) demonstrated, in a systematic review, that profile construction is essential for the

effectiveness of adaptive educational games, with data-driven approaches such as neural networks becoming increasingly common. In the context of competitive simulations involving artificial intelligence, Zare et al. (2022) confirmed that recognising decision-making patterns enables systems to improve their performance by anticipating adversarial behaviours.

Finally, Mizrahi, Laufer, and Zuckerman (2020) explored decision-making in tacit coordination games, finding that anticipatory capacity and behavioural flexibility are linked to the player's strategic profile, directly influencing group success.

These contributions consistently demonstrate that profiling not only aids in understanding player behaviour but also enables the personalisation of learning experiences, the adaptation of pedagogical strategies, and the anticipation of behaviours in simulated contexts.

3. Methodology

This study is based on the construction of a structured questionnaire designed to identify player profiles based on decision-making patterns in simulated contexts.

The aim of this exploratory and quantitative study, complemented by qualitative elements, is to build player profiles based on strategic decision-making patterns in gamified educational contexts. The methodology is based on the application of a structured questionnaire, developed on the theoretical basis of classic models of strategic decision-making and behaviour.

The survey's structure was developed using principles from game theory, decision psychology, and educational gamification, enabling the inference of participants' strategic characteristics.

The robustness of the methodology was enhanced through a methodological triangulation strategy encompassing three levels. First, theoretical triangulation was employed by deriving strategic parameters from multiple complementary theoretical frameworks, including game theory, cognitive psychology, and data science applied to games. Second, data source triangulation was implemented by integrating quantitative data—such as closed-ended responses and numerical scoring—with qualitative data, including participants' open-ended descriptions and self-assessments of decision-making style. Third, expert triangulation involved the participation of three independent academic specialists in the conceptual validation of the instrument, ensuring consistency across items, profiles, and strategic literacy constructs. This multilayered triangulation approach reinforces interpretative validity and mitigates biases typically associated with unidimensional or solely self-reported instruments.

The questionnaire consists of 12 questions, 11 of which are multiple-choice and one open-ended. Each question was carefully designed to explore one of the following strategic parameters:

- Orientation toward individual vs. collective gain
- Reaction to competition
- Tendency toward cooperation
- Risk aversion
- Value priorities (e.g., profit, reputation, loyalty)
- Previous experience with games/simulations
- Responsiveness to unexpected situations
- Self-declared competitiveness level
- Self-assessment of decision-making style

Each response was linked to one or more of four predefined profiles: Competitive, Cooperative, Adaptive, and Cautious, with scores attributed according to how well the implicit behaviour matched the traits of each profile.

Structure and Purpose of the Questions

- **Q4. How do you make decisions in competitive situations?** Assesses the tendency to maximise individual gains or seek balance. → Profiles: Competitive, Cooperative, Adaptive, Cautious.
- **Q5. If another player copies your strategy, you...?** Measures reactivity to others' behaviour. → Profiles: Competitive, Adaptive, Cooperative, Cautious.
- **Q6. How often are you willing to cooperate?** Assesses willingness to collaborate and interpersonal trust. → Profiles: Cooperative, Adaptive, Competitive, Cautious.
- **Q7. Do you prefer... (guaranteed vs. uncertain gain)** Measures risk aversion and decision-making style under uncertainty. → Profiles: Cautious, Competitive, Adaptive.
- **Q8. What do you value most as a decision-maker?** Reflects strategic priorities (profit, reputation, loyalty, growth). → Profiles: Cooperative, Competitive, Adaptive, Cautious.
- **Q9. Have you previously participated in simulations/games?** Assesses familiarity and openness to simulated environments. → Profiles: Competitive, Adaptive, Cooperative, Cautious.
- **Q10. How do you react to unexpected events?** Tests resilience, creativity, and planning. → Profiles: Cautious, Cooperative, Adaptive, Competitive.
- **Q11. Do you consider yourself a...?** Self-assessment of competitiveness level. → Profiles: Competitive, Adaptive, Cooperative, Cautious.
- **Q12. Describe your game strategy in a free-form sentence.** Captures strategic style nuances and confirms dominant profile.

The scoring logic was defined through a matrix: 2 points were awarded to the response most representative of a given profile, 1 point for ambivalent answers, and 0 points for non-aligned choices. The final profile is the one with the highest point total; hybrid profiles are allowed in cases of tied scores.

This methodology combines quantitative and qualitative analysis to identify strategic decision-making styles in educational game contexts. The use of games and simulations in higher education has proven effective in promoting skills such as critical thinking, problem-solving, and decision-making in realistic and engaging settings (Gee, 2003; Plass, Homer, & Kinzer, 2015). Quantitative analysis allows for objective classification of profiles based on response patterns. In contrast, qualitative analysis (via open-ended questions) complements the understanding with individual nuances of strategic style (Loh & Li, 2016).

The application of this methodology is especially relevant in fields such as management, tourism, and economics, where decision-making under pressure, adapting to dynamic contexts, and negotiating interests are key competencies (Aydin, Karal, & Nabiyev, 2022). By identifying students' profiles, educators can tailor pedagogical challenges to their preferred strategies, promoting more effective and personalised game-based learning experiences (Slater et al., 2022).

Strategic Profiles Assessed

Below are the four profiles defined based on participants' responses:

- **Competitive**. Focused on individual performance, the competitive player aims to maximise their gains, even at the expense of others' well-being. This profile tends to be impulsive, goal-oriented, and prefers dominance strategies and quick responses to challenges (Gee, 2003). It is effective in high-pressure environments but less so in cooperative games.
- **Cooperative.** This profile seeks balance and mutual benefit. The cooperative player values stable relationships, social reputation, and long-term collaboration. They act empathetically and tend to build sustainable solutions. In educational games, this player stands out for their preference for negotiation and teamwork (Slater et al., 2022).
- **Adaptive** represents the flexible player who can adjust their behaviour according to context and the actions of others. They adapt well to uncertainty and rapid changes, showing strategic versatility. Studies indicate that this profile performs well in complex and dynamic environments (Loh et al., 2016).

- **Cautious** Avoids risk and prefers stability. The cautious player seeks to gather as much information as possible before acting and makes decisions with time and consideration. This profile is suited for games with high cognitive demands and long-term planning (Aydin et al., 2022). While slower, it is reliable and consistent in strategy.

4. Evaluation Table and Profile Determination

To operationalise the classification of participants into player profiles, an evaluation table was constructed that cross-references each questionnaire item with the four defined strategic profiles: Competitive, Cooperative, Adaptive, and Cautious. Each question was designed to elicit a choice that reveals a relevant behavioural inclination. The correspondence between selected options and profiles is based on criteria derived from literature on decision-making and strategic behaviour (Loh et al., 2016; Bicalho et al., 2019; Aydin et al., 2022).

Table Structure The table includes the following columns:

- **Question**: formulation of the strategic scenario
- **Options A to D**: possible responses, each associated with one or more profiles and assigned a score

Each response option was coded as follows:

- **2 points**: if it strongly represents a specific profile;
- **1 point**: if it indicates traits shared between two profiles;
- **0 points**: if it does not represent any dominant profile.

The total score accumulated for each profile throughout the questionnaire allows the calculation of the participant's final profile score. The dominant profile is the one with the highest cumulative score.

Example of Application: Assume a student selects the following answers:

- Q4: c) → Adaptive (2 pts)
- Q5: b) → Adaptive (2 pts)
- Q6: b) → Cooperative (1 pt), Adaptive (1 pt)
- Q7: c) → Adaptive (2 pts)
- Q8: c) → Adaptive (2 pts)
- Q9: b) → Adaptive (2 pts)
- Q10: c) → Competitive (1 pt), Adaptive (1 pt)
- Q11: b) → Adaptive (2 pts)

In this case, the Adaptive profile totals **13 points**, becoming the dominant profile.

Final Profile and Feedback. The dominant profile is automatically recorded in a spreadsheet, where each row corresponds to a respondent. A script developed using **Google Apps Script** calculates the totals, classifies the profile, and sends a personalised email to the participant with:

- The name of the identified profile;
- A brief description of the corresponding strategic style;
- Suggestions on how that style may influence decisions in professional contexts (such as tourism, management, economics).

This approach ensures an objective analysis and provides immediate formative feedback, which is essential for developing students' metacognitive competencies (Plass et al., 2015; Slater et al., 2022).

Table 1: Player profile evaluation table based on the questionnaire.

Question	Option A	Option B	Option C	Option D
Q4: How do you make decisions in competitive situations?	Competitive (2 pts)	Cooperative (2 pts)	Adaptive (2 pts)	Cautious (2 pts)
Q5: If another player copies your strategy, you...?	Competitive (2 pts)	Adaptive (2 pts)	Cooperative (2 pts)	Cautious (2 pts)
Q6: How often do you cooperate with competitors?	Cooperative (2 pts)	Cooperative (1 pt), Adaptive (1 pt)	Competitive (1 pt), Cautious (1 pt)	Competitive (2 pts)
Q7: You prefer...	Cautious (2 pts)	Competitive (2 pts)	Adaptive (2 pts)	Cautious (2 pts)
Q8: What do you value most?	Cooperative (2 pts)	Competitive (2 pts)	Adaptive (2 pts)	Cautious (2 pts)
Q9: Have you participated in games or simulations before?	Competitive (2 pts)	Adaptive (2 pts)	Cooperative (2 pts)	Cautious (2 pts)
Q10: If something unexpected happens, you...	Cautious (2 pts)	Cooperative (2 pts)	Competitive (1 pt), Adaptive (1 pt)	Cautious (2 pts)
Q11: You consider yourself a...	Competitive (2 pts)	Adaptive (2 pts)	Cooperative (2 pts)	Cautious (2 pts)

The system was implemented within the **Google Workspace environment**, utilising automated data collection via Google Forms, automatic calculation in Google Sheets, and personalised result delivery through **Google Apps Script**. This process ensures **scalability**, **personalisation**, and **data confidentiality** in compliance with **GDPR**.

Defined Profiles

Based on questionnaire responses and the behavioural evaluation matrix, four strategic profiles were defined to reflect distinct approaches to decision-making in game, simulation, and gamified educational contexts. These profiles are inspired by models from cognitive psychology, game theory, and strategic behaviour studies (Plass et al., 2015; Mizrahi et al., 2020; Loh & Li, 2018).

Competitive

This profile is centred on individual performance, with a strong drive to win and achieve maximum results, even at the expense of others. This player tends to adopt dominance strategies, exploit opponents' weaknesses, and respond quickly to challenges. Motivated by measurable goals such as profit, scores, or recognition, competitive players exhibit a lower tolerance for cooperation that does not yield clear personal benefits. This profile is standard in high-pressure environments such as corporate or market management. According to Gee (2003), competitive players tend to thrive in contexts with clear rules and direct rewards, but may be less effective in group dynamics that require negotiation or empathy.

Cooperative

This player values a balance between personal and collective interests. Cooperative profiles emphasise building sustainable relationships, fostering mutual trust, and maintaining a good reputation. They seek win-win solutions, even if it means sacrificing short-term gains for long-term stability or group harmony. Studies, such as those by Slater et al. (2022), show that cooperative players are often associated with participatory and collaborative learning environments where social interaction enhances learning. They perform well in simulations where trust, negotiation, and interdependence are essential to achieving shared goals.

Adaptive

The adaptive player is strategically flexible, adjusting decisions based on the behaviour of others and changing contextual conditions. Rather than following a rigid playstyle, this player responds situationally, striking a balance between risk and opportunity. They are particularly effective in games with high variability or unpredictability, where reading the environment and recalibrating strategies is critical (Loh et al., 2016). Pedagogically, adaptive profiles excel in multivariable scenarios, making informed decisions even under ambiguous or rapidly changing conditions (Plass et al., 2015).

Cautious

This profile is characterised by high risk aversion, a preference for safety, and a strong need to gather information before taking action. Cautious players tend to take longer to decide but are more consistent and coherent in their strategies. They are susceptible to uncertainty and prefer scenarios where they can plan, test hypotheses, and retain control. According to Aydin et al. (2022), this profile performs well in games with clear instructional support, step-by-step simulations, or structured feedback systems. While less proactive in direct competition, cautious players are valuable in risk management, strategic analysis, and planning environments.

5. Results

Responses were collected from second-year Management students to a survey on decision-making styles in competitive contexts. The variables analysed included age, frequency of cooperation, preference for types of gains, reaction to unexpected events, self-assessment of competitiveness, and other behavioural indicators. The sample was distributed across four final profiles: Adaptive, Cautious, Competitive, and Cooperative (see Table 2).

Table 2: Modal values by profile.

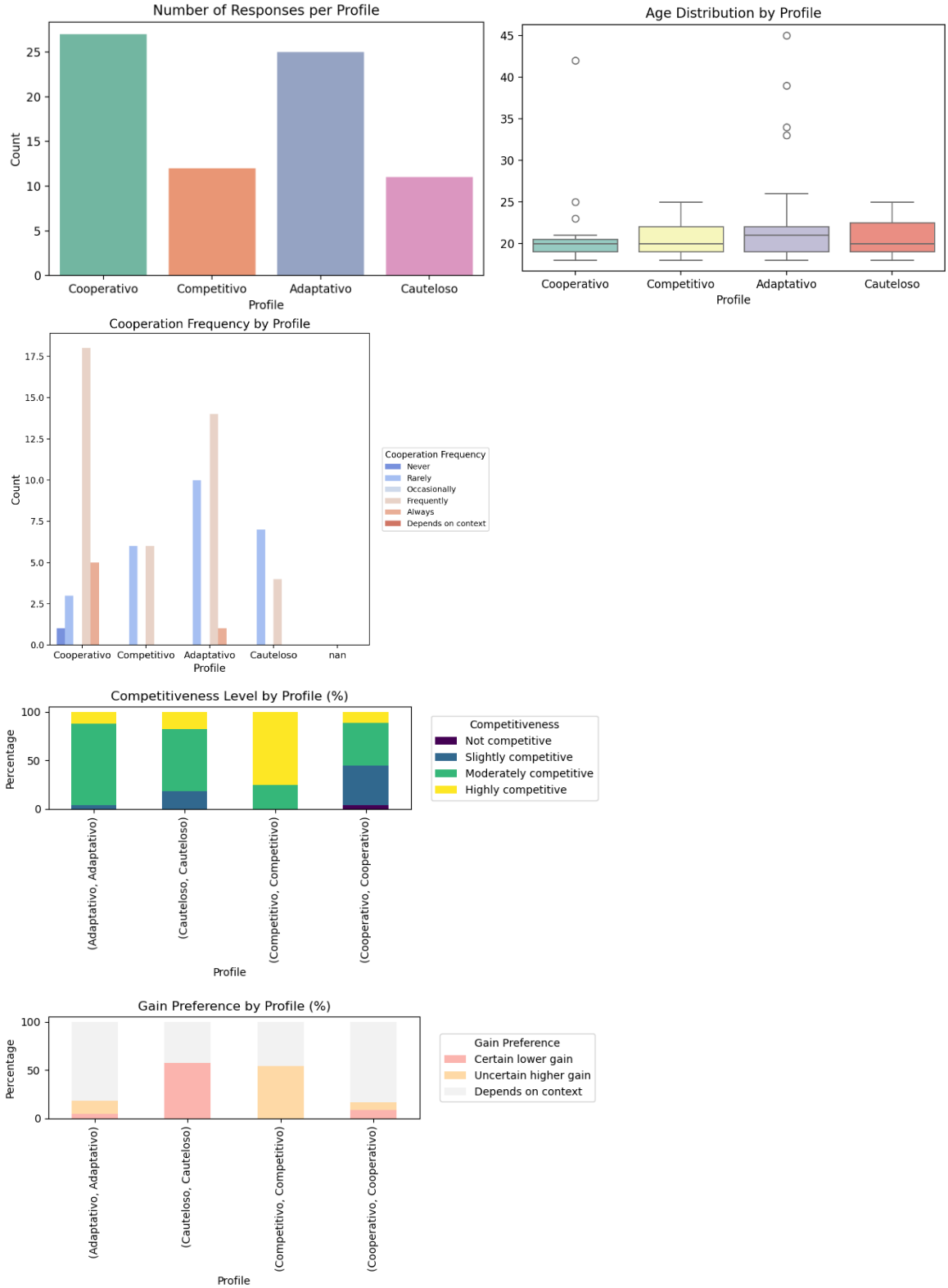
Profile	Adaptive	Cautious	Competitive	Cooperative
Course:	Management	Management	Management	Management
Year of attendance:	2nd year	2nd year	2nd year	2nd year
Do you currently work?	I don't work at the moment	I don't work at the moment	I don't work at the moment	I don't work at the moment
Age:	19	19	19	20
How do you make decisions in competitive situations?	b) I try to find win-win solutions.	b) I try to find win-win solutions.	b) I try to find win-win solutions.	b) I try to find win-win solutions.
If another player or agent copies your strategy, you...	b) I try to differentiate my approach.	b) I try to differentiate my approach.	a) Counterattack with more force.	b) I try to differentiate my approach.
How often are you willing to cooperate with competitors or opponents?	Frequently	Rarely	Frequently	Frequently
Prefer...	c) It depends on the context.	a) A lower guaranteed win.	b) An uncertain but potentially higher gain.	c) It depends on the context.
What do you value most in decision-making?	Long-term growth	Long-term growth	Immediate profit or gain	Long-term growth
Have you participated in simulations, strategic games or group dynamics?	yes, once or twice	No, but I'd like to try it	Yes, several times	No, but I'd like to try it
If an unexpected event arises (e.g. crisis, unforeseen event), you...	b) You evaluate the impact and adjust calmly.	a) You always have an alternative plan.	b) You evaluate the impact and adjust calmly.	b) You evaluate the impact and adjust calmly.
You consider yourself a person...	Moderately competitive	Moderately competitive	Very competitive	Moderately competitive

Simple Summary of Profiles

- **Adaptive** — Frequently cooperates, adjusts to context, displays moderate competitiveness, prefers long-term growth.
- **Cautious** — Rarely cooperates, seeks guaranteed gains and security, shows moderate competitiveness, maintains backup plans.
- **Competitive** — Highly competitive, seeks quick profit and uncertain gains, reacts with counterattacks, cooperates in a confrontational setting.
- **Cooperative** — Frequently cooperates, focuses on long-term goals and balance, responds with "it depends on the context," shows moderate competitiveness, handles unexpected events calmly.

These four lines capture the key traits that distinguish each profile.

Figure 1: Visualisation panel.



Legend: (a) Profile distribution, (b) Age, (c) Cooperation frequency, (d) Competitiveness level, (e) Gain preference.

Main Results

1. **Sample Size** The distribution of respondents (Figure 1-a) shows a slight predominance of the **Cooperative** profile, followed by **the Competitive profile; the Adaptive** and **Cautious** profiles appear less frequently and at similar levels. This asymmetry suggests a greater affinity among students for collaborative approaches.
2. **Age** The box plot (Figure 1-b) highlights a narrow age range (19–20 years). The **Cooperative** profile presents a slightly higher median, indicating that increased maturity may favour more consensus-oriented attitudes.
3. **Frequency of Cooperation** Figure 1-c reveals a clear divide:
    - **Competitive** and **Adaptive** profiles report "frequent" **cooperation**;
    - **Cooperative** respondents split between "frequent" **and** "depends on the context";
    - **Cautious** individuals mainly selected "rarely." This suggests that the propensity to collaborate correlates with risk tolerance and the time horizon for expected returns.
4. **Self-Assessment of Competitiveness** As shown in Figure 1-d, three profiles cluster around “moderately competitive,” while the **Competitive** profile stands out with “very competitive.” This aligns with their preference for immediate gains and counterattack responses when their strategies are copied.
5. **Gain Preference** Figure 1-e reinforces the divergence in risk management:
    - **Cautious** players prioritise guaranteed gains;
    - **Competitive** players prefer uncertain and high rewards;
    - **Adaptive** and **Cooperative** profiles adopt a more contextual approach (“depends on the context”).

Interpretation and Implications

- **Adaptive** — Motivated by joint maximisation and flexibility, demonstrates high cooperation and remains calm in the face of uncertainty. Ideal for teams that require quick adaptation without compromising relationships.

- **Cautious** — Oriented toward safety and stability; cooperates infrequently and prefers certain gains. Valuable in projects requiring risk control, though excessive prudence may hinder innovation.

- **Competitive** — Results-driven and aggressive in competitive scenarios, accepts high risk. Well-suited to dynamic markets where speed and short-term advantage are key, though it may jeopardise long-term alliances.

- **Cooperative** — Prioritises mutual benefits and long-term goals, frequently cooperates, and manages crises with composure. Suited for collaborative projects, building social capital and sustainability, though material gains may take longer to achieve.

The four profiles share a common academic background and a general preference for win-win strategies, but diverge significantly in terms of risk appetite, competitive intensity, and reward timelines. These differences should be taken into account when composing teams, designing incentive structures, and developing simulation games in both academic and corporate settings.

Study limitations

This study is acknowledged to be in an exploratory validation phase. The sample is small and homogeneous, and no formal psychometric analyses have been conducted at this stage. Nevertheless, the application of methodological triangulation ensures internal coherence and a sound theoretical foundation. In a subsequent phase, the model is expected to be applied to multicultural samples, incorporating confirmatory factor analysis, cross-validation procedures, and statistical calibration of the identified profiles.

6. Conclusion

This article represents an original contribution to the development of a model for constructing player profiles based on strategic decision-making, applicable to the context of higher education. The main outcome of this work was the design of an automated tool that, through a structured questionnaire, identifies strategic decision-making styles in gamified learning environments.

The proposed methodology combines principles from game theory, decision psychology, and educational gamification, resulting in an innovative behavioural diagnostic instrument with strong pedagogical potential. The tool offers a systematic approach to personalised learning, allowing educational challenges to be tailored to each student's strategic profile while fostering metacognitive development.

Given the conceptual and technical soundness of the model, the conditions are in place for its large-scale application across diverse institutional contexts, including universities in other countries. Such expansion will enable validation across varied cultural and educational settings, contributing to the advancement of more learner-centred and data-informed teaching practices.

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