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Does the Cards against Calamity Learning Game Facilitate Attitudes toward Negotiation, Civics, and Sustainability? Empirical Findings from Greek Graduates

Eleni G. Makri

Unicaf, Old International Airport, 7130 Larnaca, Cyprus; e.makri@unicaf.org

Abstract: Learning games for instruction constitute a progressively important, mutually universal challenge for academics, researchers, and software engineers worldwide. Embracing no definite rules for encouraging negotiation, civics, and sustainability game-based learning and agency decisions, this study investigates negotiation/conflict and civics/sustainability-related attributes, as examined through the use of a learning game in a college environment. The author elaborates on the negotiation/conflict and civics/sustainability-related knowledge, attitudes, and skills of 60 Greek non-public college post-graduate students, explored post-gaming, and compared with classroom instruction as part of a negotiation/conflict management module in business psychology sessions in 2019/2020. The findings indicate the integrative negotiation/conflict resolution management and positive civics/sustainable development-associated attitudes of learners post-gaming when compared with lecture instruction. Cooperation, civic action, seeking knowledge about political/societal issues, and gains in problem-solving skills predicted civic responsibility attributes post-gameplay. Non-working status significantly affected the "argument"/verbal fight negotiation/conflict management perceptions of students with non-voting in elections status post-gaming, while working significantly influenced "walk away"/neutral negotiation/conflict resolution attitudes in participants with non-voting in elections status after gameplay. Non-voting in elections attributes significantly impinged on "argument"/verbal fight negotiation/conflict management attitudes for Athens municipality students after gaming. The learning game-based negotiation/conflict management- and civic/sustainability spectrum-related positive effects are reviewed alongside academic and management outcomes, and directions for future research are presented in light of global learning game negotiation/conflict resolution and civics/sustainability-related teaching and learning.

Keywords: learning games; negotiation/conflict resolution; civics/sustainability development; tertiary education; Greece

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1. Introduction

"In the first turns of the game, we tried to increase the satisfaction of the inhabitants by improving the infrastructure . . . It was only after the first flood that we discovered the disadvantages of this strategy when we had to spend a lot of money to repair the damage. The safety of the inhabitants should have been taken into account from the beginning" [1].

"I have been very lucky and successful in college because I have received the support of others as well, and I have been a really active and involved student . . . " [2] (p. 30).

Learning-game technology seems to have emerged as a medium of social change, assisted by its integrated virtual interactivity [3] (p. 723), fostering learning and innovation [4] by offering spaces for collaboration and knowledge creation or co-creation [5]. They tend to make the learning of concepts enjoyable through exercise, trial and error, reflective action, reiteration, and experimenting. They can be adapted to diverse modes of learning, motivating students to engage in problem-solving, creative thinking, social/peer learning, and agency of innovation [6,7]. This includes social networking and empowerment to start

making deliberate decisions and acting properly, taking into account economic, social, and environmentally sustainable current and future development, which seem to be relevant in a civics-associated capacity [8,9]. Learning games are considered to "*have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement. This does not mean that serious games are not, or should not be, entertaining*" [10] (p. 14). They have been adapted to diverse teaching and learning settings and disciplines worldwide, including medicine and public health [11], armed forces training [12], STEM education [13], foreign language and culture literature [14], sustainable resource management [15], business management [16], civic education [17], mathematics [18], and physics [19], among others. Endorsing edutainment—including realism/authenticity (designed in an artificial real-life context), social interface/interaction (single- to multi-player), and actions/tasks to be performed (active learner/player with AR/VR game mechanics or more inactive agency) [20]—has been linked to positive learner knowledge, attitudes, and skills; particularly, both domain- and subject-specific (e.g., computer programming [21]) and/or transferable/transversal skills [22]. Additionally, game design that has been performed by the learners/players themselves, as co-creators, has been indicated to encourage reflection (and/or shared reflection) in such a range that improves traditional teaching, learning instruction, and judgment [23]. In addition, their influence on social behavior appears to be present whenever learners/players discuss the issues raised during gaming with their families, friends, peers, and/or educators, described as "civic chat" [24]. In this sense, as the latter author has suggested, learning games may be conceptualized as socializing actors that have a place in the social interaction of their learners and whose effects should be positioned and explored within daily life and not seen as discrete activities.

Collective/civic action and/or engagement, along with sustainable development—which is closely connected with conflict resolution—incorporated into peace education (among others) may be well-promoted through learning games [25]. Engaged and informed citizens can contribute to social problem-solving and improve the well-being, prosperity, and equity of local communities, as well as society at a national and international level [26]. Hence, the target of such gaming ought to facilitate "ongoing and sustained participation in civic life" [27] (p. 342), drawing on the ongoing worldwide initiative of "re-blossoming civic learning and engagement" [28] (p. 64) across people's life spans. Nevertheless, empirical evidence on the assessment of learning games and traditional classroom instruction seems to have reached neither a definite view of learning performance across diverse learner groups and disciplines nor fixed associations between negotiation/conflict and civics/sustainability management, especially in higher education [29]. In this respect, therefore, by exploring negotiation/conflict management and civics/sustainability in the context of teaching and learning in higher-education graduates (through the use of learning games across university students as proximal to the workforce), we might additionally disentangle the learning attributes that learning games might reveal as rising—though not all-embracing—instructional tools for negotiation/conflict and civics/sustainability management teaching and learning in tertiary education and adult-learning contexts.

In this setting, the current paper seeks to present the empirical evidence obtained from classroom sessions in a negotiation/conflict management module in a business psychology course at a non-public college in Greece. In our investigation of lectures and gaming, the students shared their negotiation/conflict management- and civics/sustainability-associated attributes with regard to self-confidence, cooperation, communication, compromise (bargaining), conflict resolution and civic action, interpersonal and problem-solving skills, political awareness, social justice, civic responsibility, seeking knowledge about political/societal issues, and gains in problem-solving and leadership skills. This was carried out in learner-centered "hands-on" lab sessions performed during the 2019/2020 academic year. The survey included 60 post-graduate full-time participants, in order to assess the nature and extent of their learning experience after lectures and after gaming instruction in the negotiation/conflict and civic/sustainability-linked continuum, as a means to foster successful negotiation/conflict and civic/sustainability management through learning

gameplay. Based on the reasoning noted above, the study questions that adhere to the aim of the current research are as follows:

- Do learners indicate different levels of negotiation/conflict resolution- and civic/sustainability-related knowledge, attitudes, and skills post-lecture and post-gaming?
- Can any significant associations between negotiation/conflict- and civic/sustainability-related attributes be found for learners post-gaming?
- Can any differences be indicated in negotiation/conflict- and civic/sustainability-related knowledge, attitudes, and skills reported by post-graduate participants based on working status (yes vs. no), municipality of origin (Athens vs. other), and voting in elections (yes vs. no) post-gaming?

The remainder of the current paper is structured as follows: Section 2 elaborates on a cross-cultural review of negotiation/conflict resolution- and civic/sustainability-associated research across lectured and learning gaming instruction. Section 3 reports a short description of the game, the study methodology, and measurements. Section 4 reports on the analysis of the empirical evidence. Section 5 summarizes the findings, as well as their impact on negotiation/conflict and civic/sustainability-associated patterns. Section 6 concludes this paper, including future research directions for learning gaming assessment as open innovation science tools in the negotiation/conflict and civic/sustainability-related sphere of learning pedagogics and experience.

2. Background Literature

2.1. Games for Conflict Resolution/Management

Alhabash and Wise (2012) [30] have reported on their study involving 68 undergraduate advertising course students in a USA university. They were assigned to play either the character of the Palestinian president (N = 35) and/or that of the Israeli prime minister (N = 33) while interacting with PeaceMaker, a learning game aimed at instructing them in peaceful conflict management. Before gaming, the participants were introduced to the experimental procedure and first completed a pre-test inventory, which included their attitudes towards Palestinians and Israelis in terms of them being favorable, prone to violence or democracy, targeting civilians from the other side, and intention toward peaceful resolution. Then, they were exposed to different photos of Palestinians and Israelis and asked to state their perception of nationality and their degree of valence and arousal whilst looking at the presented pictures, based on their rating of the latter. After finishing the pre-test assessment, the participants played the game for 20 min, being assigned the character of either the Palestinian president and/or the Israeli prime minister, as above. After the completion of the game, the students were instructed to fill in the same post-test instrument and were debriefed about the experimental procedure followed. After gameplay, a positive change was indicated in the student's attitudes toward Palestinians and a negative one toward Israelis, reflecting an attitude change attributed to the learning and game mechanics. Gameplayers assuming the character of the Palestinian president reported a significant unfavorable change in their perceptions towards Israelis when comparing their pre- and post-test gaming assessments, accordingly. Their peers assigned to assume the character of the Israeli prime minister did not indicate any significant differentiation in their perceptions toward the Israelis when comparing their before- and after-test gameplay scores. The students that assumed the character of the Israeli prime minister did not indicate a significant difference in their appraisal of Palestinians when comparing the before- and after-test gaming assessments, while their counterparts taking the character of the Palestinian president indicated significantly more favorable perceptions towards Palestinians when comparing the before- and after-test gaming measurements.

Marocco et al. (2015) [31] have reported on their study using Enact, a learning game aimed at instructing learners/players in negotiation and conflict resolution/management skills by interacting with virtual reality agents. The game is designed around eight diverse scenarios considering negotiation and conflict management real-life cases and assesses the negotiation strategies of learners/players adopted based on [32], including five ne-

gotiation and conflict resolution styles mapped into two fundamental dimensions (care for self and care for others), as follows: (a) Integration (increased level of care for self and others), (b) obligation (decreased care for self and increased care for others), (c) domination (increased care for self and decreased care for others), (d) avoidance (decreased care for self and decreased care for others), and e) compromise (in-between care for self and others). The learners/players assumed different agent roles under each scenario and interacted/negotiated with diverse virtual agents. Before the gameplay experience, an online survey on competencies deemed as related to negotiation and conflict resolution across three countries (Spain, Turkey, and Italy) revealed the following outcomes: Successful communication (90%), understanding, and being put into anothers' shoes (70%), along with taking decisions (65%) were the responses reported in Spain; efficient communication (80%), problem-solving (50%), understanding and being put into others shoes (50%), and creative thinking skills (50%) were the corresponding responses in Turkey; and, finally, critical thinking skills (64%) and active listening (64%) completed the relevant findings from Italy. The game prototype was evaluated in two public sessions run by the University of Plymouth, UK. The first one involved 152 learners/players aged 6–60, who returned favorable feedback for the game content and user interface, being also interested in future improvements to the game. The second one included 39 learners/players, who were required to practice four diverse game scenarios and offer corresponding feedback and debriefing comments. Overall, positive attitudes were again indicated for the game learning and design mechanics, with declared interest in future gaming under different scenarios than the ones addressed.

2.2. Games for Civic Learning/Sustainability

Gordon and Baldwin-Philippi (2014) [33] have reported on their research on the Community PlanIt (CPI) learning game designed for civics-related learning. The game was designed to offer instruction on local planning in favor of civic-life learning. There were two gameplay sessions nine months apart: the first included seven game missions in Boston, USA, each lasting five days, with an overall 35 days of gaming, 451 enrolled players, and more than 4600 feedback comments. The second took place in Detroit, USA, and involved three game missions at seven days each, for an overall 21 days of gaming, including 1043 enrolled players providing 8400 feedback comments. In particular, 31% of the Boston gamers were high school students, with their peers in Detroit gaming rounds being 35 years old or younger. Registered players in both cities originated from diverse social-economic, cultural, and educational backgrounds. User experience surveys for both in-game groups were developed in collaboration with local authorities in Boston and Detroit. Focus groups and interview data gathered indicated that the CPI game appeared to receive favorable learner/player perceptions towards fostering reflection at an interpersonal and group level, as the users were able to form teams within the game system and shared interests and network relationships with multiple stakeholders (e.g., educational institutions, local authorities, and religious communities), and could discuss civics-associated challenges with their counterparts and other stakeholders from different age groups, exercising shared trust linked to institutional and civic participation trust and engagement.

Damani, Sardeshpande, and Gaitonde (2015) [34] have elaborated on the FloodSim learning game, which is aimed at instructing students about flooding risk prevention and management in London, UK, leading to civic engagement. The learners/players assume the role of flood policy consultants to address the challenge of flooding by implementing or choosing from a number of strategies under a pre-defined budget. Within a month, 25,701 individuals had played the game, with the vast majority of them (38.2%) being 21–30 years old, followed by 25.7% being 21–45 years of age and 22.8% 11–20 years old. The feedback received by the general public and students of all ages in relation to the gaming learning experience was favorable, indicating positive views with regard to awareness, proactive action, and effective management of flood hazards and related policy-making among stakeholders.

Peng, Lee, and Heeter (2010) [3] have described their study comparing Darfur is Dying—a social change and civic/sustainability-associated learning game mapped into an emerging refugee crisis—with a corresponding text/language-based presentation instruction. Their aim was to explore which mode of presentation (i.e., learning game or text-based) was more successful in instigating positive perceptions on facilitating the refugee/humanitarian crisis scenario set. A total of 133 undergraduate students with communication technology and advertising degrees participated in the two studies followed, as briefly indicated in the following. In study 1, 65 of the participants were assigned to the gameplay session and 68 of their peers to the corresponding text/language-based mode instruction. The latter was designed according to the context probes offered in the game version. Before gameplay or text reading, a pre-test inventory, including assessments of empathy perceived and engagement with and prior knowledge of the humanitarian issue at hand was completed by the attendees. An additional illustration of the Darfur emergency setting was also provided after inventory allocation. When the pre-test questionnaire had been filled in, the participants were guided to proceed with playing the first section of the game, with up to three attempts, and their text/language-based peers spent a few minutes reading the Darfur emergency scenario. Once finished, both groups were guided to complete the post-test inventory, which included items on role-taking in terms of their motivation to assist the refugees in the corresponding crisis. Gamers, in comparison to text/language readers, were indicated to be more willing to give money to instigate awareness about the Darfur humanitarian crisis, to sign in a petition with a view to end the emerging crisis, to communicate the corresponding crisis with their social networks and family members, and assume a greater role-taking attitude towards addressing the fuelled crisis, where role-taking was indicated as a partial mediator of the association between instruction medium (game/text) and willingness to assist. Study 2 included 120 undergraduate students that took part in the experimental condition: 40 were randomly assigned to a gameplay session, 40 of their peers watched a video recording of the Darfur is Dying game, and the last 40 of their counterparts read through a scenario/storyline about Darfur, with targeted individuals for role-taking. The same willingness to assist inventory as in Study 1 was also employed in Study 2, with the addition of a game employability measure. The gameplay group indicated higher levels of willingness to donate to raise awareness about the Darfur crisis, sign a petition to resolve the crisis, communicate about the challenges of the crisis to friends and family, forward the provided information about the Darfur crisis to the wider public, and assume role-taking initiatives to address Darfur crisis; however, contrary to Study 1, no mediating effect of gameplay in the association between instruction medium (game/text/watch) and eagerness to assist was observed, thereby triggering further research. Rather surprisingly, the gamers indicated a less enjoyable experience in relation to watchers and readers, reflecting an issue to explore regarding improvement of the particular game mechanics and re-assessing its enjoyability.

Solinska-Nowak et al. (2018) [35] have presented a comprehensive overview of 45 non-commercial gamification and learning games-related tasks reflecting civic/sustainability in terms of disaster risk management challenges. Of the aforementioned 45 games, 13 of them were indicated for college and university students, and the other 39 were designed for adults, the general public, and/or specific purpose (expert) audiences in order to either instruct or prepare them for city management and/or prevent DRM-related risks. Disaster-risk-management-associated game attributes tend to include raising awareness and addressing natural hazards such as earthquakes, floods, hurricanes, volcanic eruptions, and pandemic-related diseases (e.g., dengue), among others. Team-working, collaboration, networking, sense of community, resilience, improvement of communication and decision-making, sustainable resource management, data crowd-sourcing, and spatial capacity building were noted as features of practice in geographical information systems (GIS) settings. Collectively, pre-and post-gaming assessments indicated improved natural risk awareness and preparedness of the community in the case of hazardous events, including property management- and community service learning-related actions. The

authors suggested that gender issues and/or cultural diversity might be added to the learning and game mechanics, along with improved social presence and interaction between characters/agents and debriefing instructions, whenever possible.

Finally, Chatziiliou and Paraskeva (2017) [36] have described their study on 40 undergraduate students, which aimed to assess their civic capacity, creative thinking, negotiation, and teamwork skills during their pre- and post-gameplay experience of a learning game designed and deployed in the Virtual World of Second Life based on a true storyline of conflict in Ancient Greek mythology. Post-gaming, the learners indicated increased levels of civic-related attributes in relation to the corresponding ones before gaming.

In summary, the aforementioned background literature seems to indicate improved post-gaming negotiation/conflict management and civic learning/sustainability outcomes for adult learners across diverse countries, universities, courses, and context conditions.

3. Materials and Methods

3.1. Description of the Game

Global organizations and communities across the world have invested in and contributed to the implementation of learning games instructing on negotiation/conflict resolution and civic/sustainability attributes among gamer communities. The "Cards Against Calamity" game [37] (CACG; https://www.gamesforchange.org/games/cards-against-calamity/, accessed on 6 November 2019) reflects such a learning tool developed for educators/tutors. Figure 1 below depicts an introductory screenshot of the game.

Figure 1. Cards Against Calamity Game Introductory Screenshot.

The storyline of the game is built around the players/agents taking the role of a mayor in a city by the sea. Their goal is to balance the motives, targets, and needs of various stakeholder cohorts (e.g., professional fishermen, visitors, and enterprise owners) whilst ensuring that the city is safe from unemployment, environmental emergencies, natural crises such as typhoons, and unexpected tourists. The first grand challenge is to select a region, with various regions of the United States offered, each with its own set of regional events and choices. The next step is to build resilience (level select) by managing events and getting ready for whatever the future may hold. The player instructs community groups to support those who need it the most, as well as managing weather disasters together, so everyone comes out unharmed. The game can be used to illustrate and stimulate, motivating decision-makers to role-play as particular stakeholders who specialize in fishing, services/public services, industry, and tourism sectors as they communicate and negotiate plans that will both reinforce their community and each other. Figure 2 provides a screenshot of the game.

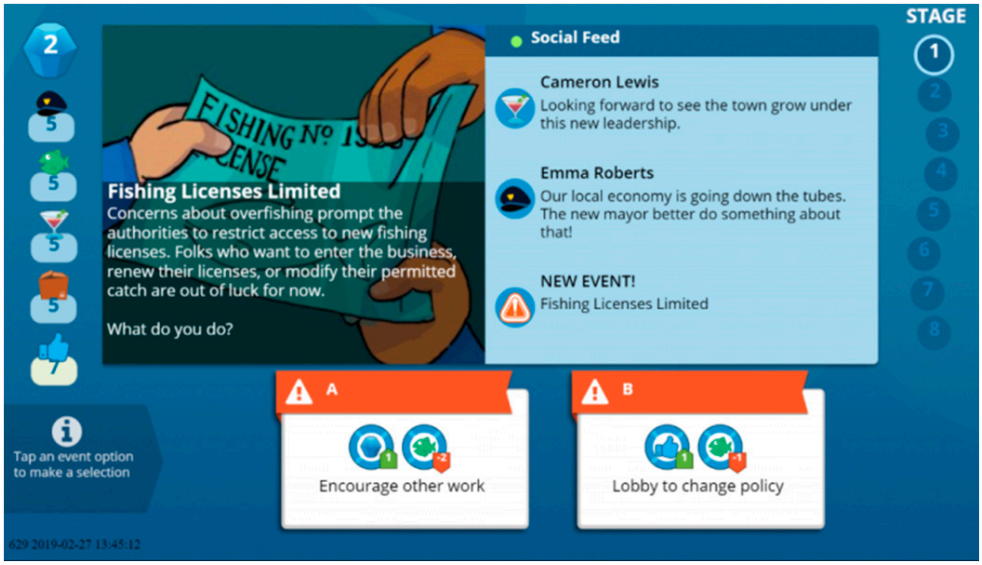

Figure 2. CACG Screenshot.

The player selects from various decisions, such as attracting new visitors or educating/training new fishers, or investing budgets in crisis service development or road maintenance, with the goal of balancing the individual, team/group, and/or community rights, needs, and preferences with those of municipality citizens. The player is provided with favorable and unfavorable comments/feedback from community stakeholder groups through a social media feed. The second grand challenge is to practice perseverance: the player must demonstrate awareness of and readiness for future events in order to ensure that their city is prepared. As mayors, they should direct and lead municipality citizens to assist themselves and their peers who are most helpless in acute weather conditions and emergency events so all are unharmed and not neglected.

3.2. Study Design

A total of 60 non-public college participants from Athens and other regions enrolled in a post-graduate business psychology course took part in the current survey as part of their 3 h laboratory session [38] in the negotiation/conflict resolution module. All of the registered students offered their informed consent form to take part in the survey after receiving a short information sheet indicating the aims of the research using their data. Figure 3 below outlines a flow diagram of the study.

After the consent form was returned, they were first asked to provide demographic data regarding their gender, residency, age, work status (state vs. non-public), and enrolment to vote in elections. Then, they attended an hour-long negotiation/sustainability classroom lecture (including the fulfilment of designated tasks). After that, they filled in the negotiation/conflict resolution continuum items taken from the Five Factor Negotiation Scale (FFNS) [39] and the Civic Attitudes and Skills Questionnaire (CASQ), mirroring civic/sustainability challenges [40]. The FFNS questionnaire included the following scales: (a) Self-confidence (i.e., confidence in self, deemed essential for assertive negotiation), (b) cooperation (i.e., eagerness to work together with others), (c) communication (i.e., readiness to cooperate with peers), and (d) compromise/bargaining (i.e., inclination to abandon something, to trade-off, and respond to the needs of others with the view to achieving their goals), with all of the previous questions responded on a 5-point Likert scale based on how often the specific items related to the participants (1 = never to 5 = always); as well (e) conflict resolution/management (i.e., disposition to discuss, in order to sort out a discrepancy or challenge, rather than being aggressive in the event of conflict). This question consisted of six items that referred to the kind of association/involvement that existed (i.e., parents/guardians, tutors, friends, sisters/brothers, people of same age

but not friends, and partners). For each of the aforementioned items, the learners were offered five response selections, from which they were required to rank their top three regarding how they address disagreements, challenges, and/or conflicts (i.e., physical fighting, argument, walk away, get an adult, and talk it out). All of the FFNS sub-scales demonstrated moderate/medium to high *a* consistency reliabilities (i.e., 0.70 to 0.80), apart from self-confidence and communication sub-scales, which were not used in the analyses as a result of decreased reliability.

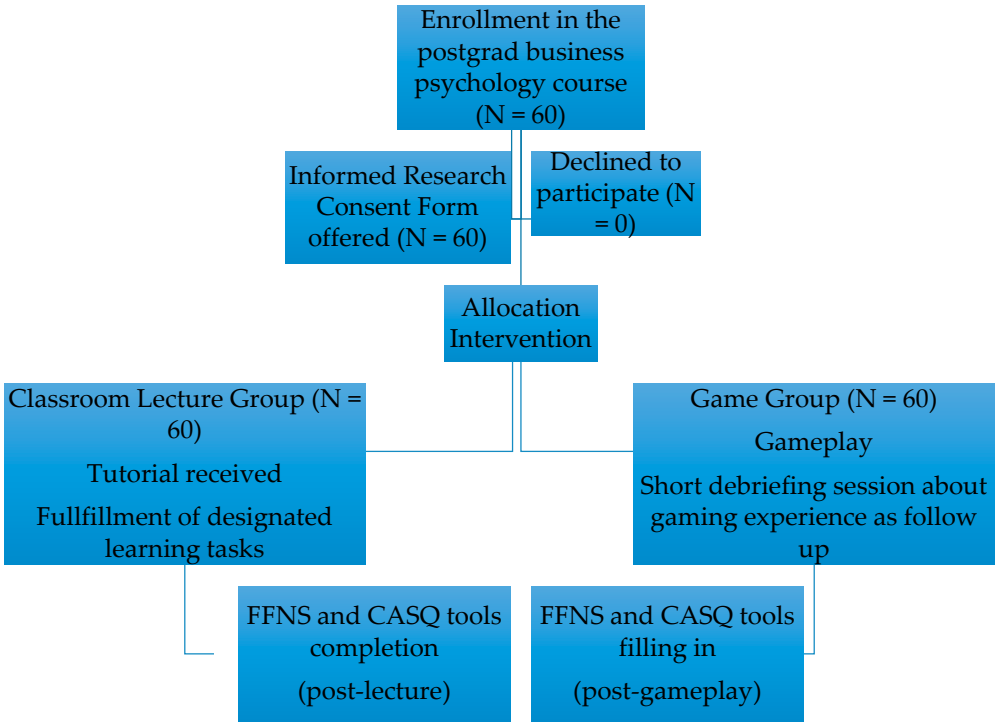

Figure 3. Flow diagram of the study.

The second questionnaire included 10 scales: civic action, interpersonal and problem-solving skills, political awareness, leadership skills, social justice and diversity attitudes, seeks knowledge about political/societal issues, gains in problem-solving and leadership skills, and civic responsibility. All of the questions used a 5-point Likert response mode, based on the range of agreement or disagreement with each item (1 = completely disagree to 5 = completely agree). All of the CASQ scales demonstrated moderate/medium to high *a* consistency reliability (i.e., 0.79 to 0.83), except diversity attitudes and leadership skills scales, which were not employed in the analyses due to their lower reliability. In both questionnaires, items negatively worded for presentation were reverse-coded before analyses were performed. Participants answered their negotiation/conflict management attitudes and skills and civic/sustainability instruments, reflecting their overall experience with the negotiation classroom lecture presented (post-lecture). During the second and third hours of their laboratory session, the lecturer/tutor first presented them with the civic/sustainability learning game through a demo. Learner cohorts were motivated and instructed to play the game for as long as they enjoyed it, either individually or in pairs/groups across all game levels and tasks for up to one hour. After [41], who suggested that debriefing post-gameplay tends to sustain the bridge between game practice and learning, the debriefing of the students indicated that most of them were engaged in their gaming and finished all game activities. Following [42], the tutor also played the role of mediator and encouraged favorable and brief dialogue following the game, inspiring learners to generate interactive discussion directed toward reflection post-gameplay. The participants indicated favorable perceptions with regard to their overall learning gaming

experience. Post-gaming, they were asked to fill in the corresponding negotiation/conflict and civic/sustainability-associated knowledge, attitudes, and skills instrument.

4. Results

A total of 36 males and 24 females (N = 60) from Attica (N = 32) and other (N = 28) regions completed negotiation/conflict management and civic/sustainability-associated questionnaires in full overall, both post-lecture and post-gaming. Table 1 below illustrates the means (M) and standard deviations (SD) for all study variables, both post-lecture and post-gaming. To explore the possible relationships between negotiation/conflict resolution and civic/sustainability management-associated attributes post-gaming among students, the following analyses were conducted: Hierarchical regression analyses for the prediction of civic responsibility by negotiation/conflict resolution and CASQ continuum post-gaming (illustrated in Tables 2 and 3). Further, to investigate the possible differences in negotiation/conflict resolution and civic/sustainability-associated knowledge, attitudes, and skills demonstrated by the respondents post-gaming, a 2 (working status: working vs. non-working) × 2 (voting in elections: yes vs. no) and another 2 (municipality of origin: Athens vs. other) × 2 (voting in elections: yes vs. no) between-groups ANOVAs were additionally conducted (as presented in Tables 4 and 5, respectively).

Table 1. Means (M) and standard deviations (SD) of the study variables post-lecture and post-gameplay (N = 60).

Negotiation/Conflict Resolution Continuum	Post-Lecture		Post-Gameplay	
	M	SD	M	SD
Cooperation/C	3.18	0.47	3.22	0.48
Compromise/Bargaining/CB	3.12	0.54	3.14	0.56
"Argument"/Verbal Fight/Arg/VF	1.29	0.45	1.33	0.47
"Walk Away"/Neutral/WA/Neutral	1.78	1.05	1.93	1.07
"Get an Adult"/Constructive Action/GA/CA	0.69	0.81	0.80	0.84
"Talk it Out"/Negotiation/TO/N	1.09	0.45	1.15	0.47
Civic/Sustainability Continuum				
Civic Action/CA	3.14	0.80	3.20	0.82
Interpersonal and Problem-Solving Skills/IPSS	3.68	0.72	3.75	0.73
Political Awareness/PA	3.65	0.88	3.69	0.91
Social Justice/SJ	3.62	0.43	3.63	0.43
Civic Responsibility/CR	3.36	0.72	3.38	0.75
Seeks Knowledge about Political/Societal Issues/SKPSI	3.29	0.60	3.32	0.60
Gains in Problem-Solving Skills/GPSS	3.90	0.97	3.94	1.01
Gains in Leadership Skills/GLS	3.34	0.88	3.38	0.92

Notes: C = Cooperation; C/B = Compromise/Bargaining; "Arg"/VF = Conflict Resolution "Argument" (Verbal Fight); "WA"/Neutral = Conflict Resolution "Walk Away" (Neutral); "GA"/CA = Conflict Resolution "Get an Adult" (Constructive Action); "TO"/N = Conflict Resolution "Talk it Out" (Negotiation); CA = Civic Action; IPSS = Interpersonal and Problem-Solving Skills; PA = Political Awareness; SJ = Social Justice; CR = Civic Responsibility; SKPSI = Seeks Knowledge for Political Societal Issues; GPSS = Gains in Problem-Solving Skills; GLS = Gains in Leadership Skills.

Table 2. Hierarchical regression analyses for the effects of negotiation/conflict resolution-associated variables on civic responsibility post-gameplay.

	Civic Responsibility Post-Gaming		
	β	***R²***	**ΔR^2**
Step 1: *Control variables* Gender	−0.19		
Step 2: *Main effects*		0.16 *	0.10 **
Cooperation/C	0.32 *		
Compromise/Bargaining C/B	−0.13		
Argument/Verbal Fight/Arg/VF	0.23		
Walk Away/Neutral/WA/ Neutral	−0.01		
Talk it Out/Negotiation/TO/N	−0.01		
Get an Adult/Constructive Action/GA/CA	0.23		

Notes: * $p < 0.05$ (one-tailed); ** $p < 0.01$ (one-tailed); C = Cooperation; C/B = Compromise/Bargaining; "Arg"/VF = Conflict Resolution "Argument" (Verbal Fight); "WA/Neutral = Conflict Resolution "Walk Away" (Neutral); "GA"/CA = Conflict Resolution "Get an Adult" (Constructive Action); "TO"/N = Conflict Resolution "Talk it Out" (Negotiation); CA = Civic Action; IPSS = Interpersonal and Problem-Solving Skills; PA = Political Awareness; SJ = Social Justice; CR = Civic Responsibility; SKPSI = Seeks Knowledge for Political Societal Issues; GPSS = Gains in Problem-Solving Skills; GLS = Gains in Leadership Skills.

Table 3. Hierarchical regression analyses for the effects of CASQ-related variables on civic responsibility post-gaming.

	Civic Responsibility Post-Gaming		
	β	***R²***	**ΔR^2**
Step 1: *Control variables* Gender	−0.16 *		
Step 2: Main effects		0.72 ***	0.19 ***
Civic Action/CA	0.23 *		
Interpersonal and Problem-Solving Skills/IPSS	−0.02		
Political Awareness/PA	0.01		
Social Justice/SJ	0.09		
Seeks Knowledge about Political/Societal Issues/SKPSI	0.20 *		
Gains in Problem-Solving Skills/GPSS	0.54 ***		
Gains in Leadership Skills/GLS	−0.00		

Notes: * $p < 0.05$ (one-tailed); *** $p < 0.001$ (one-tailed); C = Cooperation; C/B = Compromise/Bargaining; "Arg"/VF = Conflict Resolution "Argument" (Verbal Fight); "WA/Neutral = Conflict Resolution "Walk Away" (Neutral); "GA"/CA = Conflict Resolution "Get an Adult" (Constructive Action); "TO"/N = Conflict Resolution "Talk it Out" (Negotiation); CA = Civic Action; IPSS = Interpersonal and Problem-Solving Skills; PA = Political Awareness; SJ = Social Justice; CR = Civic Responsibility; SKPSI = Seeks Knowledge for Political Societal Issues; GPSS = Gains in Problem-Solving Skills; GLS = Gains in Leadership Skills.

Table 4. Comparisons between post-gaming reactions of learners related to negotiation/conflict resolution and civic/sustainability continuum separately after controlling for working status and voting status.

Negotiation/Conflict Resolution Continuum	**Working Status (M, (MM))**		**Voting Status (M, (MM))**		**2-Way ANOVA between Working Status and Voting Status (a = 0.05)**
Cooperation (C) (8 items, a = 0.70)	W	Non W	V	Non V	$F(1,60) = 3.007$, $p < 0.10$, partial $\eta^2 = 0.052$ (working status). Main effect analysis: no significant difference between voting and non-voting (p almost equals 0.5). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.5)
	3.41	3.18	3.21	3.25	
	(3.27)	(3.16)	(3.29)	(3.34)	
Compromise/Bargaining (C/B) (8 items, a = 0.76)	3.42	3.09	3.13	3.15	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.2) and between voting and non-voting status (p almost equals 0.8). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.5)
	(3.43)	(3.10)	(3.31)	(3.18)	
Argument/Verbal Fight (Arg/VF) (6 items, a = 0.77)	1.21	1.30	1.24	1.42	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.2) and voting and non-voting status (p almost equals 0.8). Interaction effect analysis: $F(1,60) = 2.966$, $p < 0.10$, partial $\eta^2 = 0.091$. Non-working higher than working ($x^2(10) = 16.160$, $p < 0.01$) and non-voting higher than voting ($x^2 = (20) = 64.086$, $p < 0.01$) (Figure 4)
	(1.28)	(1.41)	(1.26)	(1.31)	
Walk Away/Neutral (WA/Neutral) (6 items, a = 0.79)	2.86	1.74	1.87	2.05	$F(1,60) = 14.115$, $p < 0.01$, partial $\eta^2 = 0.204$ (working status) Main effect analysis: no significant difference between voting and non-voting (p almost equals 0.4). Interaction effect analysis: $F(1,60) = 5.443$, $p < 0.05$, partial $\eta^2 = 0.040$. Working higher than non-working ($x^2(10) = 17.400$, $p < 0.01$) (Figure 5) and no significant difference between voting and non-voting status (p almost equals 0.7).
	(2.81)	(1.62)	(2.07)	(2.52)	
Get an Adult/Constructive Action (GA/CA) (6 items, a = 0.80)	0.30	0.77	0.72	0.65	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.2) and voting and non-voting status (p almost equals 0.9). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.7).
	(0.23)	(0.75)	(0.50)	(0.59)	

Table 4. *Cont.*

Negotiation/Conflict Resolution Continuum	Working Status (M, (MM))		Voting Status (M, (MM))		2-Way ANOVA between Working Status and Voting Status (a = 0.05)
Talk it Out/Negotiation (TO/N) (6 items, a = 0.71)	1.20 (1.15)	1.14 (1.09)	1.17 (1.18)	1.08 (1.13)	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.5) and voting and non-voting status (p almost equals 0.9). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.6).
Civic/Sustainability Continuum					
Civic Action (CA) (8 items, a = 0.80)	3.41 (3.40)	3.16 (3.22)	3.10 (3.07)	3.50 (3.63)	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.4) and voting and non-voting status (p almost equals 0.2). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.3).
Interpersonal and Problem-Solving Skills (IPSS) (12 items, a = 0.79)	3.90 (3.96)	3.71 (3.75)	3.70 (3.75)	3.85 (3.89)	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.6) and voting and non-voting status (p almost equals 0.9). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.9).
Political Awareness (PA) (6 items, a = 0.81)	3.91 (3.95)	3.64 (3.61)	3.72 (3.95)	3.53 (3.51)	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.5) and voting and non-voting status (p almost equals 0.4). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.3).
Social Justice (SJ) (8 items, a = 0.79)	3.67 (3.53)	3.62 (3.64)	3.61 (3.66)	3.70 (3.71)	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.6) and voting and non-voting status (p almost equals 0.4). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.9).
Civic Responsibility (CR) (11 items, a = 0.82)	3.33 (3.23)	3.38 (3.39)	3.37 (3.35)	3.42 (3.43)	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.1) and voting and non-voting status (p almost equals 0.8). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.9).

Table 4. *Cont.*

Negotiation/Conflict Resolution Continuum	Working Status (M, (MM))		Voting Status (M, (MM))		2-Way ANOVA between Working Status and Voting Status (a = 0.05)
Seeks Knowledge about Political/Societal Issues (SKPSI) (13 items, a = 0.83)	3.45	3.29	3.34	3.26	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.4) and voting and non-voting status (p almost equals 0.8). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.8).
	(3.40)	(3.27)	(3.43)	(3.29)	
Gains in Problem-Solving Skills (GPSS) (3 items, a = 0.82)	4.10	3.91	3.97	3.85	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.5) and voting and non-voting status (p almost equals 0.8). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.9).
	(3.97)	(3.87)	(4.10)	(3.90)	
Gains in Leadership Skills (GLS) (3 items, a = 0.81)	3.42	3.37	3.35	3.50	Main effect analysis: no significant difference between working and non-working status (p almost equals 0.8) and voting and non-voting status (p almost equals 0.7). Interaction effect analysis: no significant difference between working status and voting status (p almost equals 0.6).
	(3.39)	(3.39)	(3.30)	(3.55)	

Notes: Working N = 10; Non-working N = 50; Voting N = 45; Non-voting N = 15; Total N = 60; *a* = Cronbach's Alpha, M = Mean, MM = Estimated Marginal Mean, a = the limit of the significant level.

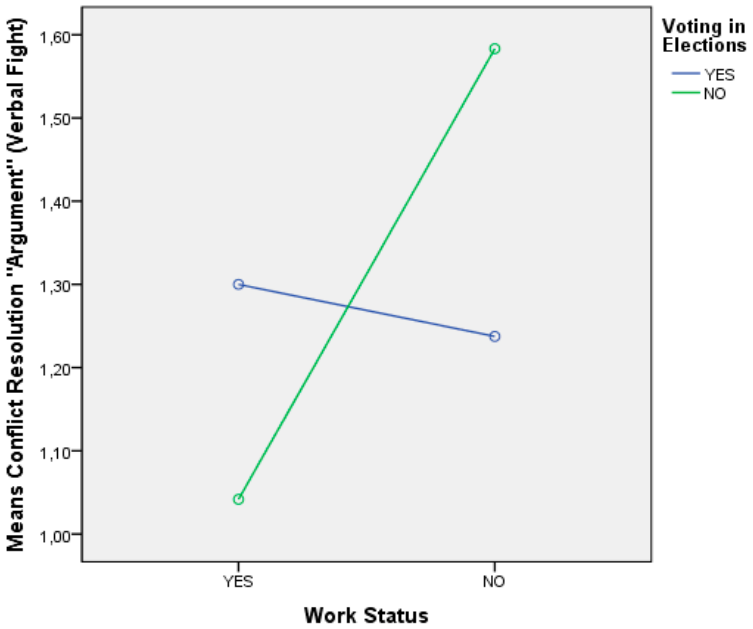

Figure 4. Interaction effect for conflict resolution "Argument"/Verbal Fight by working status and voting in elections.

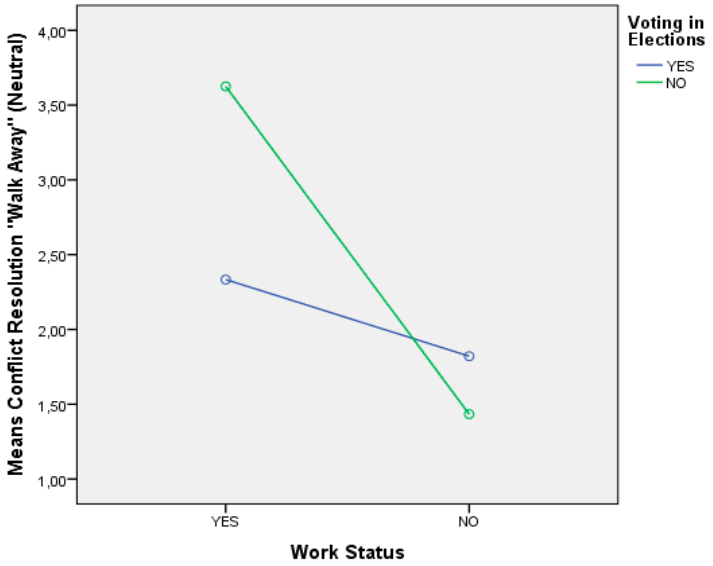

Figure 5. Interaction effect for conflict resolution "Walk Away"/Neutral by working status and voting in elections.

Table 5. Comparisons between post-gaming reactions of learners related to negotiation/conflict resolution and civic/sustainability continuum separately after controlling for municipality background and voting status.

Negotiation/Conflict Resolution Continuum	**Municipality Background (M, (MM))**		**Voting Status (M, (MM))**		**2-Way ANOVA between Municipality Background and Voting Status (a = 0.05)**
Cooperation (C) (8 items, a = 0.70)	Athens	Other	V	Non V	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.6) and voting and non-voting status (p almost equals 0.7). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.4).
	3.21	3.22	3.21	3.25	
	(3.16)	(3.12)	(3.21)	(3.20)	
Compromise/Bargaining (C/B) (8 items, a = 0.76)	3.23	3.05	3.13	3.15	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.1) and between voting and non-voting status (p almost equals 0.6). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.4).
	(3.33)	(3.19)	(3.12)	(3.24)	
Argument/Verbal Fight (Arg/VF) (6 items, a = 00.77)	1.29	1.28	1.42	1.24	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.1) and voting and non-voting status (p almost equals 0.1). Interaction effect analysis: $F(1,60) = 4.355$, $p < 0.05$, partial $\eta^2 = 0.073$. Non-voting higher than voting ($x^2(20) = 64.086$, $p < 0.001$) (Figure 6) and no significant difference between Athens and other municipality origin (p almost equals 0.5).
	(1.52)	(1.35)	(1.25)	(1.55)	

Table 5. *Cont.*

Negotiation/Conflict Resolution Continuum	Municipality Background (M, (MM))		Voting Status (M, (MM))		2-Way ANOVA between Municipality Background and Voting Status (a = 0.05)
Walk Away/Neutral (WA/Neutral) (6 items, a = 0.79)	1.86 (1.92)	2.00 (2.17)	1.87 (1.88)	2.05 (2.04)	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals0.8) and voting and non-voting status (p almost equals 0.8). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.9).
Get an Adult/Constructive Action (GA/CA) (6 items, a = 0.80)	0.69 (0.39)	0.69 (0.50)	0.72 (0.70)	0.65 (0.45)	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equal 0.1) and voting and non-voting status (p almost equals 0.4). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.06).
Talk it Out/Negotiation (TO/N) (6 items, a = 0.71)	1.11 (1.03)	1.18 (1.12)	1.17 (1.18)	1.08 (1.03)	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.3) and working and non-working status (p almost equals 0.6). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.6).
Civic/Sustainability Continuum					
Civic Action (CA) (8 items, a = 0.80)	3.16 (3.10)	3.24 (3.31)	3.10 (3.08)	3.50 (3.36)	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.3) and voting and non-voting status (p almost equals 0.5). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.1).
Interpersonal and Problem-Solving Skills (IPSS) (12 items, a = 0.79)	3.86 (3.87)	3.62 (3.80)	3.70 (3.67)	3.85 (3.86)	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.3) and voting and non-voting status (p almost equals 0.6). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.5).
Political Awareness (PA) (6 items, a = 0.81)	3.63 (3.48)	3.75 (3.86)	3.72 (3.74)	3.53 (3.46)	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.4) and voting and non-voting status (p almost equals 0.6). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.7).

Table 5. *Cont.*

Negotiation/Conflict Resolution Continuum	Municipality Background (M, (MM))		Voting Status (M, (MM))		2-Way ANOVA between Municipality Background and Voting Status (a = 0.05)
Social Justice (SJ) (8 items, a = 0.79)	3.56	3.69	3.61	3.70	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.8) and voting and non-voting status (p almost equals 0.3). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.1).
	(3.68)	(3.51)	(3.64)	(3.74)	
Civic Responsibility (CR) (11 items, a = 0.82)	3.35	3.41	3.37	3.42	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.6) and voting and non-voting status (p almost equals 0.7). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.6).
	(3.30)	(3.26)	(3.38)	(3.37)	
Seeks Knowledge about Political/Societal Issues (SKPSI) (13 items, a = 0.83)	3.23	3.41	3.34	3.26	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.2) and voting and non-voting status (p almost equals 0.7). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.8).
	(3.16)	(3.37)	(3.36)	(3.20)	
Gains in Problem-Solving Skills (GPSS) (3 items, a = 0.82)	4.10	3.77	3.97	3.85	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.1) and voting and non-voting status (p almost equals 0.9). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.5).
	(4.20)	(3.72)	(3.95)	(4.00)	
Gains in Leadership Skills (GLS) (3 items, a = 0.81)	3.44	3.31	3.35	3.50	Main effect analysis: no significant difference between Athens and another municipality origin (p almost equals 0.4) and voting and non-voting status (p almost equals 0.7). Interaction effect analysis: no significant difference between municipality origin and voting status (p almost equals 0.7).
	(3.57)	(3.30)	(3.33)	(3.57)	

Notes: Athens municipality origin N = 32; Other municipality origin N = 28; Voting N = 45; Non-Voting N = 15; Total N = 60; *a* = Cronbach's Alpha, M = Mean, MM = Estimated Marginal Mean, a = the limit of the significant level.

Table 1 above indicates that the graduates demonstrated higher levels across all negotiation/conflict resolution and civic/sustainability attributes post-gaming in relation to post-lecture teaching; in particular, for the negotiation/conflict resolution continuum, willingness to work together (cooperation), give something up, make exchanges and address the other's needs to accomplish one's goals (compromise/bargaining), argument/verbal fight, walk away/neutral, get an adult/constructive action, and talk it out/negotiation (M = 3.22, SD = 0.48; M = 3.14, SD = 0.56; M = 1.33, SD = 0.47; M = 1.93, SD = 1.07; M = 0.80, SD = 0.84; and M = 1.15, SD = 0.47, respectively).

In terms of civic/sustainability attributes: Planning to do volunteer work, community service, and assist in the clean-up of the environment (civic action); work together with

others and think logically to solve problems (interpersonal and problem-solving skills); know the issues the world, the country, and city community seem to face and plan to be involved in political process (political awareness); orientation towards public policy change and citizen attitude differentiation to solve social (exclusion) issues (social justice); planning to find a career that directly influences others, contribute to community/neighbourhood, allocate income to assist those in need and work towards equal opportunities to all (civic responsibility); updated about local, region, campus, and country matters (seeks knowledge about political/societal issues); improve creative and logical thinking in own solutions to problems (gains in problem-solving); and exercise my competence to lead, make decisions, and work together with other fellow students in leadership role (gains in leadership skills) presented higher values (M = 3.20, SD = 0.82; M = 3.75, SD = 0.73; M = 3.69, SD = 0.91; M = 3.63, SD = 0.43; M = 3.38, SD = 0.75; M = 3.32, SD = 0.60; M = 3.94, SD = 1.01; M = 3.38, SD = 0.92, respectively).

4.1. Hierarchical Regressions

Hierarchical regression analyses were performed to check for the prediction of civic responsibility for students separately by negotiation/conflict resolution and civic attributes continuum, correspondingly, post-gameplay. Before proceeding with the analyses, we ensured that all of the required conditions associated with regression (e.g., lack of multicollinearity, deviations from normality and influential cases) were addressed. Gender was used as a control variable in all regression analyses, prior corroborating research in negotiation/conflict management and civic/sustainability college education [43,44]. The findings of these analyses are reported in Tables 2 and 3.

In the first step, we entered the control variable (i.e., gender), followed by the independent variables (i.e., negotiation/conflict resolution continuum: cooperation, compromise/bargaining, "argument"/verbal fight, "walk away"/neutral, "get an adult"/constructive action, "talk it out"/negotiation and civic/sustainability continuum: civic action, interpersonal and problem-solving skills, political awareness, social justice, seeks knowledge about political/societal issues, gains in problem-solving, and leadership skills). The findings presented in Tables 2 and 3 describe the outcomes of the final associations obtained between the abovementioned scales.

Regarding the post-gameplay session, the relationships between cooperation and civic responsibility were significant, indicating cooperation as the only best predictor ($\beta = 0.32$, $p < 0.05$). The final model including the corresponding independent variable accounted for an additional 10% ($F(2,57) = 5.228$, $p < 0.01$) of the variance in civic responsibility interaction scores (Table 2).

Likewise, post-gaming, the relationships between gender, civic action, seeks knowledge about political societal issues, and gains in problem-solving skills with civic responsibility were significant, indicating the latter (i.e., gains in problem-solving skills) as the best predictor ($\beta = -0.16$, $p < 0.05$; $\beta = 0.23$, $p < 0.05$; $\beta = 0.20$, $p < 0.05$ and $\beta = 0.54$, $p < 0.001$, accordingly). The final model including the corresponding variables accounted for an extra 19% ($F(6,58) = 9.672$, $p < 0.001$) of the variance in civic responsibility interaction scores (Table 3).

4.2. 2 × 2 ANOVAs

Tables 4 and 5 below present (a) the descriptives that refer to the participant responses to each of the negotiation/conflict resolution and civic/sustainability continuum variables explored in the post-gaming examination by working status (i.e., working/non-working), municipality of origin (i.e., Attica/other), and voting in elections (i.e., yes/no); and (b) further illustrate the main and interaction effects with respect to working status, municipality of origin, and voting for each of the aforementioned negotiation/conflict management and civic/sustainability-associated variables investigated. Figures 4–6 below present the nature of the interaction effects, demonstrated based on working status and voting in elections for conflict resolution "argument" (verbal fight) and "walk away," and municipality of

origin and voting in elections for conflict management "argument" (verbal fight) scores post-gaming.

Tables 4 and 5 above illustrate the findings of the 2 × 2 ANOVA statistical analyses between the negotiation/conflict resolution and the civic/sustainability continuum after controlling for working status, voting status, and the municipality of origin. In terms of the significant differences indicated, with regards to the abovementioned continuum variables controlling for working and voting status, these can be summarized as follows (in all other attributes, no significant differences were demonstrated). There was a significant main effect of work status on eagerness to cooperate or work together (i.e., cooperation) post-lecture ($F(1,60) = 3.007$, $p < 0.10$, partial $\eta^2 = 0.052$), which indicates that the working participants scored significantly higher in their disposition to cooperate or work together than their non-working peers post-gaming (M = 3.27 and M = 3.16, respectively; estimated marginal means). However, this effect was not validated by either a significant main effect of voting in elections on readiness to sort things out with their colleagues after gameplay and/or a significant interaction effect between work status and voting in elections on cooperation scores after gaming, indicating that tertiary non-public institution learners reflecting working and non-working, in both voting and non-voting counterparts, were not influenced differently in their attitude toward cooperation or working things out with others after gameplay. In addition, there was a significant interaction effect between work status and voting in elections on the conflict resolution "argument" (verbal fight) scores of the participants ($F(1,60) = 2.966$, $p < 0.10$, partial $\eta^2 = 0.091$). This indicates that working and non-working and voting and non-voting university students were affected differently in their attitudes to conflict resolution "argument" (verbal fight) post-gameplay. Specifically, the attitudes to conflict resolution "argument" (verbal fight) exhibited by students registered as non-working (M = 1.30) were significantly higher than those indicated participants registered as working (M = 1.21) ($x^2(10) = 16.160$, $p < 0.01$); while the scores reported by the learners enrolled as non-voting in elections (M = 1.42) were significantly higher than those exhibited by the ones listed as voting (M = 1.24) ($x^2(20) = 64.086$, $p < 0.01$). Figure 4 demonstrates the nature of the interaction effect, illustrating that non-voting in elections significantly influences verbal fight conflict management perceptions in working private university students.

Further, there was a significant main effect of work status on "walk away" (neutral) perception post-measurement ($F(1,60) = 14.115$, $p < 0.01$, partial $\eta^2 = 0.204$), indicating that working private college participants scored significantly higher in their "walk away" attitudes (M = 2.81; estimated marginal means) than their non-working peers (M = 1.62; estimated marginal means) after gaming. There was a significant interaction effect between working status and voting in elections on "walk away" attitudes after the assessment ($F(1,60) = 5.443$, $p < 0.05$, partial $\eta^2 = 0.040$), indicating that working and non-working both voting and non-voting peers were affected differently in their attitude of "walk away" (neutral) conflict resolution-based behavior post-gameplay. In particular, the perceptions of conflict resolution "walk away" (neutral) by students reported as working (M = 2.86) were significantly higher than those indicated by the ones listed as non-working (M = 1.74) ($x^2(10) = 17.400$, $p < 0.01$). However, the attitudes of conflict management "walk away" (neutral) were similar in voting (M = 1.87) and non-voting (M = 2.05) learners ($x^2(20) = 16.161$, $p = 0.7$). Figure 5 demonstrates the nature of the interaction effect, showing that working influences "walk away" neutral conflict management attitudes in non-voting learners significantly while voting learners appear to be unaffected.

The significant differences indicated in relation to the negotiation/conflict and civic/sustainability continuum variables controlling for the municipality of origin and voting status presented above can be outlined as follows (in all other attributes, no significant differences were found). There was a significant interaction effect between municipality background and voting in elections on the conflict resolution "argument" (verbal fight) scores of the respondents ($F(1,60) = 4.355$, $p < 0.05$, partial $\eta^2 = 0.073$), indicating that Athens and other municipality backgrounds and both voting and non-voting university

learners were affected differently in their perceptions of conflict resolution "argument" (verbal fight) post-gameplay. In specific, the attitudes of conflict management "argument" (verbal fight) exhibited by learners originating from Athens (M = 1.29) and other municipalities (M = 1.28) were similar ($x^2(10) = 8.619$, $p = 0.569$ ns), while the attitudes of conflict resolution "argument" (verbal fight) reported by the attendees listed as non-voting (M = 1.42) were significantly higher than those observed in the participants enrolled as voting (M = 1.24) ($x^2(20) = 64.086$, $p < 0.001$). Figure 6 illustrates the nature of the interaction effect, demonstrating that non-voting attitudes significantly influence conflict management "argument" (verbal fight) perceptions in Athens municipality learners, while those from other municipalities seem not to be affected.

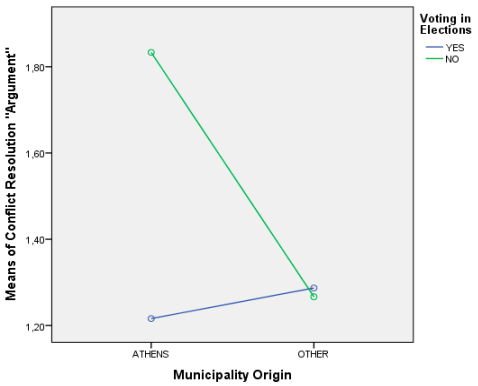

Figure 6. Interaction effect for conflict resolution "Argument"/Verbal Fight by municipality of origin and voting in elections.

5. Discussion

The current study aimed to present innovative evidence by addressing, integrating, and investigating two challenges: learning-games teaching and a learning approach with/and both the negotiation/conflict and civic/sustainability (development)-related management attributes in tertiary post-graduate education. The findings indicated in the current paper seem to relate private university post-graduate students with favorable (i.e., less impulsive and more conflict resolution-oriented) negotiation and civic engagement/sustainable development participation-associated culture post-gameplay. In this way, we expand upon the learning gaming-related positive negotiation/conflict resolution attributes observed in the general public [35] and undergraduate advertising students in the USA [30], social and civic/political mastery findings in undergraduate college and university students [40], high school and working adults [33,34], as well as evidence in public secondary education students of civic capacity/agency [45], in the cross-cultural context of post-graduate diverse discipline private university learners.

Furthermore, the results indicate an association between student edutainment gaming in private university contexts with favorable negotiation/conflict resolution and civic/sustainability-related management attributes, lending support and advancing metacognitive, individual, and community/civic-related evidence indicated in, for example, multi-modal embodied conversational agent (ECA) systems for win–win negotiation education and training in multi-cultural learner cohorts (i.e., [46] Greek and German; civic action; interpersonal and problem-solving skills; self-efficacy; self-regulation), and USA community college non-White student favorable civic agency and knowledge regarding community, national, and worldwide events [47]. Additionally, we provide a contribution to the literature on facilitating/fostering integrative negotiation/conflict resolution and civic/sustainability management-associated attributes in serious gaming experiences for private university post-graduate students.

Equally significant, the present learning civic/sustainability gameplay mode seems to further relate university students with active and positive engagement with society, region, local community, neighbourhoods, and other stakeholder services and groups in

favor of working towards equal social, financial, sustainable development, and professional opportunities to citizens, through the following attributes: (a) Willingness to work with others when effectively negotiating/conflict managing civic/sustainable development issues; (b) planning and committed towards involvement with volunteer work, community services, and action environmental/sustainability development action programmes, regularly informed through social media, press releases, and local press/TV/radio channels about issues in their own municipality/region and government/state policy, including their own educational institution and student community; and (c) improving their competence to think creatively, resolve challenges, and self-motivate to generate solutions to issues/problems.

The aforementioned findings seem to be consistent with and also advance previous ones within university settings regarding positive or integrative (problem-solving/sorting out dispute) negotiation/conflict resolution attitudes assumed by degree students in the US (ref. [43] public administration course; ref. [44] business module) and employers in the oil industry in Nigeria [48], as well as favorable SG citizenship competence development, improvement of knowledge regarding democratic processes and employability attributes facilitation for public university students [8], further relating civic/sustainability games—including the one currently explored—to enhanced civic learning-associated attributes, mirroring positive civic and sustainable development capacity for private university students, and endorsing gameplayer agency/role enhancement.

The main effect was initially indicated for working students, reporting higher levels of willingness to work with others to resolve challenges (i.e., cooperation negotiation/conflict management attribute) when compared to non-working peers, which did not appear to be further validated by an expected significant interaction between working status and voting in elections. This might tentatively be attributed to other factors/elements/features potentially taken into account and already reported in favor of integrative (i.e., problem/challenge-solving) negotiation/conflict resolution endorsement in workforce settings [48] (organizational commitment; Nigerian oil industry).

In terms of non-working and non-voting in elections, the students exhibited increased levels of "argument"/verbal fight (negotiation/conflict resolution management) attitudes post-gaming; this piece of evidence seems to agree with others illustrating more integrative/constructive (i.e., problem-solving/less impulsive) negotiation/conflict resolution approaches in graduate working learners [49] 6–18 months after practicing a role-play negotiation/conflict management simulation exercise through traditional classroom instruction, as well as further research indicating lower college student engagement with voting in the USA (see, e.g., [50]). The aforementioned empirical evidence seems to align with and/or lend support to that indicated and discussed above for working students scoring higher in "walk away"/neutral negotiation/conflict resolution attitudes post-gameplay in the non-voting case, highlighting the less impulsive/more integrative/problem-solving attributes associated with graduate employees and diverse administrative-level workers [51–53].

In addition, the revelation of non-voting being associated with less constructive/problem-solving negotiation/conflict resolution attributes (i.e., "argument/verbal fight) for Athens-origin students post-gaming not only uncovers, corroborates, and broadens prior similar study findings (as discussed above) regarding elevated non-voting for college students in the USA in an undergraduate college context for civic/sustainability-gaming for post-graduates, but also extends previous evidence illustrating a regional/municipality/location effect in the experience of service learning for Taiwanese students in tertiary education [54] (service learning), as well as prior findings indicating a regional/location effect on negotiation/conflict management attitudes for degree students in North Cyprus higher education institutions [55] after traditional classroom negotiation/conflict resolution instruction within an existing gameplay context for post-graduate learners.

Alongside the above discussion of the reported findings, Figure 7 offers a brief outline of the conceptual model summarizing the evidence obtained.

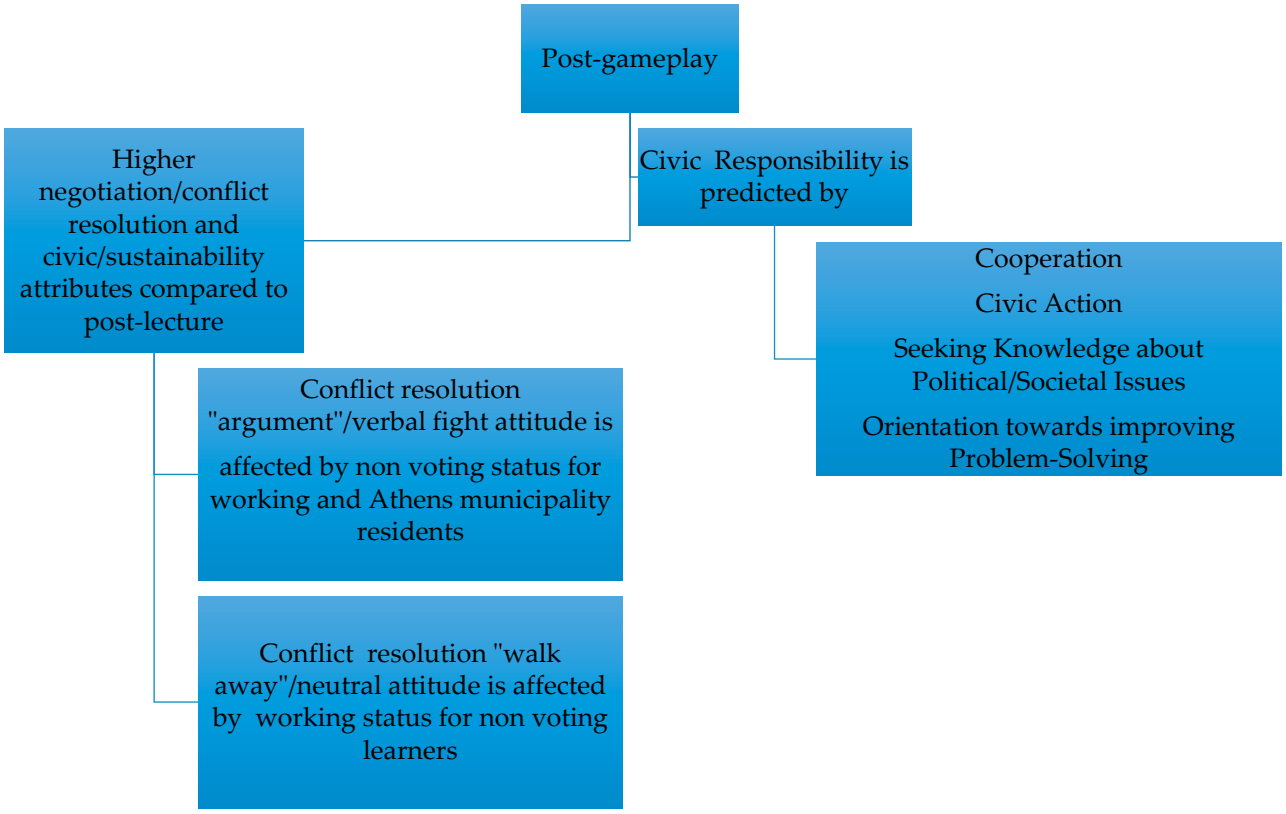

Figure 7. Outline of the conceptual model summarizing the study findings.

6. Conclusions

In the post-gameplay context, the post-graduate students proved to be successful in exercising constructive negotiation/conflict resolution and civic/sustainability development-associated knowledge, attitudes, and skills. The evidence presented herein seems to be promising in terms of revealing the proactive social capacity that learning games bear as instructional tools for negotiation and civic/sustainability development indicators and that non-working, non-voting in elections, and the municipality of origin factors were related to rather more impulsive/less constructive negotiation/conflict resolution attitudes post-gaming. The limitations of the current study include the rather short-term exploration of negotiation/conflict management and civic/sustainability attributes post-lecture and post-gaming instruction, as well as being based on a particular game and learner cohort. Alongside the findings presented in this paper, therefore, it might be helpful to further explore gameplay experience and/or learning gaming as open innovation [54] and open innovation in science tools [55]; the in-game investigation of currently explored negotiation/conflict management and civic/sustainability-related attributes, according to different learning styles adhering to personalized learning [56], as well as that when embedded in blended learning massive open online courses (bMOOCs) across diverse subjects (e.g., marketing, organizational behavior, civics education, and so on) and learner cohorts; and comparing the currently explored learning game with other formats of negotiation/conflict resolution and civic/sustainability-linked formal and informal instruction across different learner cohorts and domains in a cross-cultural manner. Extending the research by exploring the above attitudes on a longer term with a mixed-methods study design (several weeks/months) and including different learning games and learner groups within tertiary education might contribute to the longer-term and multi-level exploration and evaluation of learning games as instructional tools, as compared to traditional lectures in higher education. In this vein, the long-term facilitation of networked negotiation/conflict resolution and civic/sustainable development-related attributes for educating responsible scientists and citizens using advanced solutions as agents of cross-cultural societal and state policy

change might be further promoted. Finally, the presented approach of learning-game experience assessment across post-graduate learners may trigger/frame the scope of developing future efficient games for formally instructing graduate learners in negotiation/conflict management and civic/sustainability development challenges.

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