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Research Article

Transgender and gender-diverse (TGD) training in social education degree: Believing and creating play and narratives for learning

Paula Rodríguez-Rivera[1], Ana Manzano-León[2], Rubén Camacho-Sánchez[3], María Dolores Dapía Conde[1], José M. Rodríguez-Ferrer[4,*]

[1] *Psychosocioeducational Analysis and Intervention, University of Vigo, 32004 Ourense, Spain*

[2] *Department of Psychology, University of Almería, 04120 Almería, Spain*

[3] *Motor Action Research Group (GIAM), INDEST, Institut Nacional d'Educació Física de Catalunya (INEFC), Universitat de Lleida (UdL), 25192 Lleida, Spain*

[4] *Facultad de Ciencias de la Salud, Universidad Isabel I, 09003 Burgos, Spain*

* Corresponding author: José M. Rodríguez-Ferrer, josemiguel.rodriguez.ferrer@ui1.es, joserf@cop.es

ABSTRACT

Game Based Learning (GBL) has demonstrated its efficacy in education by addressing issues such as student boredom, motivation, and active learning. This article specifically focuses on the implementation of a cooperative training workshop to assess university students' satisfaction, motivation, and attitudes towards transgender and gender diverse (TGD) individuals. The project involved the participation of 36 students who engaged in a cooperative video game that promotes LGBTQI+ inclusivity. This immersive experience not only facilitated their learning but also fostered teamwork and familiarity with information and communication technology (ICT) programs and resources crucial to their future professional pursuits. The primary objective of the workshop was to enhance the training of students pursuing social education degrees and better prepare them for their future careers. The findings underscore the advantages of this cooperative workshop, which serves as a platform for students to develop practical skills, deepen their understanding of social issues, and cultivate positive attitudes towards TGD individuals. The study highlights GBL's potential in reducing boredom, enhancing motivation, and promoting active learning. In conclusion, GBL offers promising prospects for transforming educational practices. The integration of cooperative workshops into teaching methodologies can have a positive impact on student engagement, learning outcomes, and attitudes. Further research is required to comprehensively comprehend and effectively incorporate GBL (digital game learning) into teaching practices. By harnessing the educational potential of games, we can create more engaging and effective learning environments that equip students with the necessary skills for their future careers in social education.

Keywords: educational games; seminars; gender minorities; motivation; community education

1. Introduction

The university provides a conducive environment for promoting inclusive education and fostering an understanding of gender diversity[1]. Training university students in awareness of transgender and gender-diverse (TGD) individuals will not only contribute to the development of a more inclusive university

community but also prepare students to become more conscious and respectful citizens in society at large[2].

An innovative approach for this awareness can be through video games, as they provide an immersive experience and allow for exploration and reflection on different perspectives and experiences related to the narrative being addressed[3]. Through the interactivity of video games, students can immerse themselves in narratives and situations that enable them to empathize with the experiences of marginalized groups[4]. In the case of transgender and gender-diverse (TGD) individuals, there is limited prior research available[5,6], but it is expected that by controlling transgender characters or interacting with them in the game, students can develop a deeper understanding of the challenges, struggles, and triumphs that TGD people face in their daily lives. Video games offer a unique opportunity for education through direct practical experience[7,8].

Students can face dilemmas and make decisions that reflect different realities, enabling them to reflect on the prejudices and stereotypes that may exist in society[9,10]. These games can foster empathy among players[11] as the ability to simulate the experiences of other characters in video games can facilitate a deeper understanding of their realities, enhance motivation and interest among participants, modify behaviors, develop skills, and even promote sensitivity among students. Consequently, this can lead to improved academic performance, as these approaches are highly motivating and capable of imparting knowledge[12,13].

Furthermore, video games can provide a safe platform for exploration and learning[14,15]. Students can make mistakes, make decisions, and experience consequences within the game world, without real prejudice or discrimination[16]. This could enable an understanding of the complexities of gender identity and the challenges faced by TGD individuals, while also developing critical thinking skills and reflection on issues of discrimination and exclusion. However, it is important to note that not all video games are suitable for promoting awareness. Some games may perpetuate stereotypes or contain insensitive content[17]. It is crucial to carefully select video games used for this purpose, seeking those that address these topics responsibly and respectfully. Some games that have aimed to be transgender-inclusive, such as "Tell Me Why" (Dontnod Entertainment), which features a transgender main character named Tyler Ronan. The game addresses topics such as gender identity, the character's past, and their relationship with their family. In summary, video games have the potential to be a powerful tool for raising awareness and generating consciousness about various social issues[18]. However, their use for TGD individuals has not been widely investigated, which is why a quasi-experimental pre-post test study has been conducted on the implementation of a cooperative workshop on video games in the university degree program of Social Education. The main objective of the research has been to assess the satisfaction and motivation of university students, as well as to understand their attitudes towards TGD individuals. The research questions posed were: (1) To what extent is the academic satisfaction of university students influenced after participating in a cooperative learning program based on a video game?; (2) What are the predominant attitudes towards TGD individuals among university students before and after participating in a cooperative learning program based on a video game?; (3) What is the motivation towards cooperative learning strategies through gameplay among university students after participating in a video game-based program?

2. Method

2.1. Participants

In order to select the participants, a convenience sample was chosen. The inclusion criterion for the experimental group was the willingness to participate in the training workshop organized by one of the lead researchers. A total of 36 Social Education degree students (30 women, 5 men, and 1 non-binary individual), aged between 19 and 27 years with a mean age of 20.53 years (SD = 1.82), participated in the workshop and

voluntarily responded to an online survey consisting of open-ended questions. Among the participants, 44.4% identified as heterosexual, 47.2% as bisexual, 5.6% as lesbian, and 2.8% as homosexual.

All participants were provided with information about the project and gave their written informed consent by the Helsinki Declaration. Prior to data collection, the students were informed about the nature of the study and guaranteed anonymity. This study is part of the "EDU-INNO" Teaching Innovation Group approved by the University of Vigo.

2.2. Procedure

In this study, an innovative educational workshop was implemented using game-based learning in the subject "Social Skills in Social Education" of the Bachelor's degree in Social Education at the University of Vigo during the academic year 2022/2023. The main objective of this subject is the acquisition of social skills for professional practice, and within the curriculum of the subject, support for gender diversity is included.

The selected video game was "A normal lost phone," an LGTBI-friendly video game whose main narrative revolves around a fictional transgender character and depicts their reality in their family, personal, and social environment. The purpose of using this video game was to sensitize and raise awareness among students about TGD individuals.

In order to use the video game, the main teacher of the subject played several games with similar narratives beforehand and selected this one to work with in her classroom. This decision was based on several factors: the maximum duration of the video game was around the same length as the educational workshop, its price was lower compared to other similar games, and the gameplay mechanics had the potential to be engaging for the students.

For the four-hour educational workshop, the class group was divided into small groups of four to six students, each playing the game on a device such as a tablet or a computer. After playing the game, a joint briefing session was conducted on the topic of transgender issues and the didactic possibilities of games in their overall professional development and particularly in raising awareness about sexual and gender diversity.

2.3. Instruments and data analysis

Three instruments were used to analyze the DGL (digital game learning), satisfaction, and awareness with TGD individuals.

1) *Trans Attitudes and Beliefs Scale (TABS)*[19]: This validated questionnaire was used to measure attitudes towards the transgender community in psychology students at a spanish university. The dimensions incorporated in the TABS are: (a) interpersonal comfort (TABS-IC) (14 items), which refers to deriving pleasure from interacting and relating with TGD individuals in various contexts, whether formal or informal; (b) beliefs beyond gender binarism and sexual identity (TABS-BG) (10 items), which involves recognizing other realities within the spectrum of diversity and acknowledging the rights of individuals belonging to those realities; and (c) the value of recognizing humanity (TABS-HV) (5 items), which emphasizes perceiving TGD individuals as human beings and considering them intrinsically and idiosyncratically valuable because they are people. A 6-point Likert scale was utilized (1: strongly disagree and 5: strongly agree).

2) *Academic Satisfaction Scale*[20]: this validated questionnaire was used for university population and consists of 8 items with a 4-point Likert scale (0: never and 3: always).

3) *Motivation for Cooperative Learning Strategies (CMELAC)*[21]: The validated questionnaire was used to measure perceived motivational orientation after the completion of the intervention towards the task, learning, cooperative learning, and flow. The questionnaire consists of a total of 16 items that assess

motivation for the task (5 items), motivation for learning (6 items), cooperative learning (2 items), and flow (3 items). A 5-point Likert scale was applied (1: strongly disagree and 5: strongly agree).

The data analysis has been guided by the research objectives. To begin with, the calculation of each of the factors present in the assessment instruments used has been performed. Next, a descriptive analysis of the sample has been carried out using the mean and standard deviation. To address objectives 1 and 2, a paired samples t-test has been conducted, and the effect size has been calculated using Cohen's d. For objective 3, an interpretation has been performed with the raw scores.

3. Results

Firstly, the descriptive statistics of the university students' scores on the various tests and scales used in the study are presented (see **Table 1**).

Table 1. Means and standard deviations of the TABS, CMELAC, and Academic Satisfaction Questionnaires.

	Pretest		Postest	
	M	SD	M	SD
TABS-IC	71.16	8.25	79.55	1.55
TABS-BG	27.69	3.98	29.75	1.05
TABS-HV	52.50	12.06	58.77	2.57
Academic_Satisfaction	18.19	4.95	21.27	3.08
CMELAC_MotivationTask	-	-	23.69	2.10
CMELAC_Learning	-	-	25.77	3.87
CMELAC_CooperativeLearning	-	-	9	1.63
Flow	-	-	14.02	1.78

In the pretest of the TABS-IC, which measures interpersonal comfort towards TGD individuals, a mean score of 71.16 (SD = 8.25) was obtained. In the post-test of the TABS-IC, a mean score of 79.55 (SD = 1.55) was recorded. Furthermore, a significant positive correlation was found between the TABS-IC scores in the pretest and post-test (see **Table 2**) ($r = 0.70$, $p < 0.001$). These results indicate a significant increase in interpersonal comfort towards TGD individuals after the intervention.

In the pretest of TABS-BG, which assesses beliefs beyond binary notions of gender and sexual identity, a mean score of 27.69 (SD = 3.98) was found. In the post-test of TABS-BG, a mean score of 29.75 (SD = 1.05) was obtained. Additionally, a significant positive correlation was observed between TABS-BG scores in the pretest and post-test (see **Table 2**) ($r = 0.85$, $p < 0.001$). These findings suggest a slight increase in beliefs beyond binary notions of gender and sexual identity after the intervention.

Regarding TABS-HV, which measures the value of recognizing humanity, a mean score of 52.50 (SD = 12.06) was observed in the pretest. In the post-test of TABS-HV, a mean score of 58.77 (SD = 2.57) was recorded. Furthermore, a significant positive correlation was found between TABS-HV scores in the pretest and post-test (see **Table 2**) ($r = 0.63$, $p < 0.001$), indicating a consistent relationship in participants' valuation of humanity expressed before and after the intervention.

<div align="center">**Table 2.** *t* test between pretest and post-test.</div>

	t	*p*	*d*
PRE_TABS-IC–POST_TABS-IC	−5.915	$p < 0.001$	1.41
PRE_TABS-BG–POST-TABS-BG	−40.003	$p < 0.001$	0.71
PRE_TABS-HV–POST_TABS-HV	11.997	$p < 0.001$	0.72
PRE_Academic_Satisfaction POST_Academic_Satisfaction	−2.991	0.005	0.75

In order to address the objectives of the study, the academic satisfaction scale was also evaluated. In the pretest, a mean score of 18.19 (SD = 4.95) was found. In the post-test, a mean score of 21.27 (SD = 3.08) was obtained. Additionally, a significant positive correlation was found between pretest and post-test scores of academic satisfaction (see **Table 2**) ($r = 0.45$, $p < 0.001$), indicating an overall improvement in participants' academic satisfaction after the intervention.

To determine the magnitude of the effect size of statistically significant differences, the effect size was calculated using Cohen's d. The results of the calculations are reported in **Table 2**. It can be observed that, according to Cohen's interpretations, the effect sizes found are considered to be of large magnitude, especially in the IC variable of the TABS.

Furthermore, the motivation for cooperative learning strategies was analyzed using the CMELAC scale, which is divided into four subscales. In the task motivation subscale, a mean score of 23.69 (SD = 2.10) was obtained. In the learning subscale, a mean score of 25.77 (SD = 3.87) was recorded. In the cooperative learning subscale, a mean score of 9 (SD = 1.63) was found. Lastly, in the flow subscale, a mean score of 14.02 (SD = 1.78) was obtained.

These results indicate significant changes in attitudes, beliefs, academic satisfaction, and motivation of the participants following the intervention. Additionally, the correlations found support the consistency and validity of the instruments used in the study.

4. Discussion

The aim of this research was to carry out a comprehensive evaluation and quantitative comparison of academic satisfaction following the implementation of a cooperative workshop supported by the use of video games. Additionally, a comparison of awareness towards TGD individuals before and after the intervention was conducted, considering the possibility of future collaborations with this community.

It is worth noting that the utilization of a game-based learning methodology for raising awareness of TGD individuals in the educational context has been the subject of limited empirical research, although systematic reviews related to gender equality do exist[22]. However, previous studies have addressed related issues, such as cyberbullying, a phenomenon that negatively affects numerous individuals in virtual environments and has been the subject of detailed analysis and approaches from different disciplines. It is shown that there is a wide variety of video games, employing different strategies, confirming that serious games can be effectively used to raise awareness, foster empathy, and teach new strategies to address both bullying and cyberbullying[23–25].

In this regard, research related to video games and mental health of LGBTI individuals has also been addressed[26,27] with the purpose of understanding and addressing mental disorders, promoting psychological well-being, and improving quality of life.

However, video games are increasingly being used as a tool in the educational field[28–30] due to their playful nature and their alignment with the current language of young people.

In the present study, the effectiveness of video games as a sensitization tool, based on empathy and identification with a main character belonging to the TGD community, was investigated. The intervention was conducted with the aim of significantly reducing stigmatizing attitudes among university students.

The results obtained revealed a significant reduction in stigmatizing attitudes among students after the implementation of the workshop. It is important to highlight the magnitude of the observed effect, particularly in factors related to academic satisfaction and awareness of TGD individuals. These variables showed a greater increase after the intervention.

In conclusion, the findings of this study support the effectiveness of video games as an effective tool for generating awareness and promoting empathy towards TGD individuals, in addition to being a motivating element in the classroom. The significant reduction in stigmatizing attitudes highlights the potential of this intervention as a strategy to combat stigma and foster greater understanding and solidarity towards those who are part of the TGD community.

Overall, the results point towards promising progress in the use of game-based learning techniques in the training and sensitization of professionals in the field of Social Education, although certain limitations are detected. Firstly, the present study suffers from a relatively small sample size, which limits the generalizability of the findings. Therefore, future research could consider a larger sample of participants and examine possible disparities based on whether students are pursuing a bachelor's degree or a master's degree. Another limitation is related to the method of sample selection, as data collection in a natural educational environment made it unfeasible to conduct an analysis of the sample based on variables such as gender or age of the participants, with women between the ages of 19 and 27 predominating in the studied groups. Additionally, since the program was implemented only over a couple of sessions, it was not possible to determine the long-term effect of this methodology. In terms of future research, focus could be placed on longitudinal studies on game-based learning, which include a combined analysis with other variables such as academic performance or classroom environment. Furthermore, the effectiveness of this methodology could be evaluated in relation to other actors in the educational community. On the other hand, with a view to future research, it is recommended to conduct the study with larger samples and long-term assessments. This approach provides a comprehensive understanding of the impact of Digital Game-Based Learning (DGL) in education.

5. Conclusions

In summary, the training of future professionals in the field of Social Education is crucial to prevent transphobia and raise awareness of oppressed groups. In this sense, video games have become a valuable tool to develop digital skills and, in particular, to address issues related to gender diversity. Therefore, the inclusion of these games in initial training can be beneficial for students in the specialty of Social Education. Furthermore, the results of the research demonstrate changes in participants' attitudes, beliefs, academic satisfaction and motivation. Hence, it underlines the importance of contemplating innovative approaches in education, particularly in contexts where gender diversity awareness and the fight against transphobia are key objectives.

Ultimately, the results obtained in the study justify the use of DGBL and Gamification in university studies of social education, as it significantly reduces stigmatizing attitudes among university students. Therefore, gamified DGBL could be considered a promising pedagogical strategy for social education teachers. To evaluate the impact of this strategy, more studies and different educational contexts are needed to confirm the results obtained in this study.

Author contributions

Conceptualization, PRR, AML, RCS, MDDC and JMRF; methodology, PRR, AML, RCS and JMRF; software, AML and JMRF; validation, PRR, AML, RCS, MDDC and JMRF; formal analysis, PRR, AML, RCS and JMRF; investigation, PRR, AML, RCS and JMRF; resources, PRR, RCS and MDDC; data curation, PRR, AML, RCS, MDDC and JMRF; writing—original draft preparation, PRR, AML, RCS and JMRF; writing—review and editing, PRR, AML, RCS and JMRF; visualization, PRR, AML, RCS, MDDC and JMRF; supervision, AML, RCS, MDDC and JMRF; project administration, PRR, AML, RCS, MDDC and JMRF. All authors have read and agreed to the published version of the manuscript.

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Conflict of interest

The authors declare no conflict of interest.

References

1. McCabe PC, Anhalt K. Changing the narrative in schools: Addressing systemic barriers and stereotypes that prevent gender and sexual diverse youth from thriving. Psychology in the Schools. 2021, 59(1): 5-13. doi: 10.1002/pits.22630
2. Nieminen JH. Assessment for Inclusion: rethinking inclusive assessment in higher education. Teaching in Higher Education. Published online January 5, 2022: 1-19. doi: 10.1080/13562517.2021.2021395
3. Aura I, Hassan L, Hamari J. Teaching within a Story: Understanding storification of pedagogy. International Journal of Educational Research. 2021, 106: 101728. doi: 10.1016/j.ijer.2020.101728
4. Greitemeyer T, Osswald S, Brauer M. Playing prosocial video games increases empathy and decreases schadenfreude. Emotion. 2010, 10(6): 796-802. doi: 10.1037/a0020194
5. Thach H. A cross-game look at transgender representation in video games. Press Start. 2021, 7(1): 19-44.
6. Capuzza JC, Spencer LG. Regressing, Progressing, or Transgressing on the Small Screen? Transgender Characters on U.S. Scripted Television Series. Communication Quarterly. 2016, 65(2): 214-230. doi: 10.1080/01463373.2016.1221438
7. Egenfeldt-Nielsen S. Overview of research on the educational use of video games. Nordic Journal of Digital Literacy. 2006, 1(3): 184-214. doi: 10.18261/issn1891-943x-2006-03-03
8. Murigu JN. A Systematic Review on the Correlation between using Video Games as Instructional Strategies and Academic Success among Learners in Secondary Schools in Kenya. Journal of Pedagogy, Andragogy and Heutagogy in Academic Practice. 2023, 4(1): 26-33.
9. Grant CA, Zwier E. Intersectionality and Student Outcomes: Sharpening the Struggle against Racism, Sexism, Classism, Ableism, Heterosexism, Nationalism, and Linguistic, Religious, and Geographical Discrimination in Teaching and Learning. Multicultural Perspectives. 2011, 13(4): 181-188. doi: 10.1080/15210960.2011.616813
10. Jecke L, Zepf FD. Delivering transgender-specific knowledge and skills into health and allied health studies and training: a systematic review. European Child & Adolescent Psychiatry. Published online April 28, 2023. doi: 10.1007/s00787-023-02195-8
11. Katsarov J, Christen M, Mauerhofer R, et al. Training Moral Sensitivity Through Video Games: A Review of Suitable Game Mechanisms. Games and Culture. 2017, 14(4): 344-366. doi: 10.1177/1555412017719344
12. Ouariachi T, Li CY, Elving WJL. Gamification Approaches for Education and Engagement on Pro-Environmental Behaviors: Searching for Best Practices. Sustainability. 2020, 12(11): 4565. doi: 10.3390/su12114565
13. Rodriguez-Ferrer JM, Manzano-León A, Cangas AJ, et al. A Web-Based Escape Room to Raise Awareness About Severe Mental Illness Among University Students: Randomized Controlled Trial. JMIR Serious Games. 2022, 10(2): e34222. doi: 10.2196/34222
14. Mayer RE, Parong J, Bainbridge K. Young adults learning executive function skills by playing focused video games. Cognitive Development. 2019, 49: 43-50. doi: 10.1016/j.cogdev.2018.11.002
15. Papastergiou M. Exploring the potential of computer and video games for health and physical education: A literature review. Computers & Education. 2009, 53(3): 603-622. doi: 10.1016/j.compedu.2009.04.001

16. Shliakhovchuk E, Oliynyk R, García AM. Gen Zers' video game preferences and learning outcomes: Toward designing better games. International Journal of Technology Enhanced Learning. 2021, 13(2): 208. doi: 10.1504/ijtel.2021.114075
17. Cassell J, Jenkins H. From Barbie® to Mortal Kombat: Gender and Computer Games. MIT Press; 2000.
18. Dhiman DB. Games as Tools for Social Change Communication: A Critical Review. Global Media Journal. 2023, 21: 61. doi: 10.36648/1550-7521.21.61.357
19. López-Sáez MÁ, Angulo-Brunet A, Platero RL, et al. The Adaptation and Validation of the Trans Attitudes and Beliefs Scale to the Spanish Context. International Journal of Environmental Research and Public Health. 2022, 19(7): 4374. doi: 10.3390/ijerph19074374
20. Medrano LA, Pérez E. Adaptation of the Academic Satisfaction Scale to the University Population of Cordoba (Spanish). Summa Psicológica. 2013, 7(2): 5-14. doi: 10.18774/448x.2010.7.117
21. Manzano-León A, Camacho-Lazarraga P, Guerrero-Puerta MA, et al. Development and Validation of a Questionnaire on Motivation for Cooperative Playful Learning Strategies. International Journal of Environmental Research and Public Health. 2021, 18(3): 960. doi: 10.3390/ijerph18030960
22. Yañez AGB, Alonso-Fernández C, Fernández-Manjón B. Systematic literature review of digital resources to educate on gender equality. Education and Information Technologies. 2023, 28(8): 10639-10664. doi: 10.1007/s10639-022-11574-8
23. Calvo-Morata A, Alonso-Fernández C, Freire M, et al. Serious games to prevent and detect bullying and cyberbullying: A systematic serious games and literature review. Computers & Education. 2020, 157: 103958. doi: 10.1016/j.compedu.2020.103958
24. Feng D, Jeong DC, Krämer NC, et al. "Is It Just Me?" Evaluating Attribution of Negative Feedback as a Function of Virtual Instructor's Gender and Proxemics. In: Proceedings of the 16th Conference on Autonomous Agents and MultiAgent Systems; 8–12 May 2017; São Paulo, Brazil. pp. 810-818.
25. Pecorini A, Nocentini A, Menesini E. A systematic review of new programs developed in virtual environment for school bullying prevention (Italian). Psicologia Clinica Dello Sviluppo. 2016, 20(1): 27-54. doi: 10.1449/83129
26. Lucassen M, Samra R, Iacovides I, et al. How LGBT+ Young People Use the Internet in Relation to Their Mental Health and Envisage the Use of e-Therapy: Exploratory Study. JMIR Serious Games. 2018, 6(4): e11249. doi: 10.2196/11249
27. Strauss P, Morgan H, Wright Toussaint D, et al. Trans and gender diverse young people's attitudes towards game-based digital mental health interventions: A qualitative investigation. Internet Interventions. 2019, 18: 100280. doi: 10.1016/j.invent.2019.100280
28. de Aguilera M, Mendiz A. Video games and education. Computers in Entertainment. 2003, 1(1): 1-10. doi: 10.1145/950566.950583
29. Martinez L, Gimenes M, Lambert E. Entertainment Video Games for Academic Learning: A Systematic Review. Journal of Educational Computing Research. 2022, 60(5): 1083-1109. doi: 10.1177/07356331211053848
30. Schneider KL, Ferrara J, Lance B, et al. Acceptability of an Online Health Videogame to Improve Diet and Physical Activity in Elementary School Students: "Fitter Critters." Games for Health Journal. 2012, 1(4): 262-268. doi: 10.1089/g4h.2012.0009