

Development of a Serious Game for Practicing Pronouns

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Abstract: One primary aspect of civic education is to build inclusive societies where everyone can feel valued, respected and celebrated for their individual diverse attributes. While a civilised society exercises tolerance, empathy, compassion and forgiveness, in the daily walks of life there are no second chances to make the correct first impression. Many individuals are exceptionally apprehensive when having to interact with minorities through fear of causing unintentional offence or emotional damage in first encounter situations. Serious games can offer an immersive and educational training experience where mistakes can be made with far fewer ramifications than in real life making them significantly more risk free. This paper explores the development of *Pronouns in Practice*, a serious game designed specifically to address inclusive communication, with a focus on pronoun use. This paper will review the literature on the use of serious games in Equality, Diversity and Inclusion (EDI) related areas particularly looking at pronoun related training in the Educational Sector. The prototype will be constructed using subject experts in conjunction with user and design requirements identified in the literature review and a design framework that is outlined. The paper will present a preliminary design framework for development and evaluation of serious games in EDI related subjects and will particularly look at the use of simulations in initial human interaction with the use of pronouns. The paper intends to produce a prototype to address alleviating concerns with general interaction associated with using pronouns.

Keywords: Serious games, EDI, Pronouns, Game-Based learning, Educational game

1. Introduction

EDI initiatives have become vital to the positive culture of educational institutions (Corsino and Fuller, 2021) with studies suggesting more work is needed in the field (Cumming, Miller and Leshchinskaya, 2023; Mendoza *et al.*, 2015). As awareness grows around issues of identity, one major challenge has been the ability to equip individuals to engage respectfully and confidently with members of the LGBTQIA+ community. A crucial segment of this is the appropriate use of gender pronouns, which can be a source of discomfort or anxiety for those unfamiliar with newer linguistic norms. To mitigate these concerns and foster inclusivity, new pedagogical approaches are required. Traditional EDI workshops often involve face-to-face exercises, role-play scenarios, and group discussions. Appropriately integrating innovative technology such as serious games can offer alternative methods to facilitate inclusive dialogue and engagement, potentially broadening the training's effectiveness and accessibility since, while traditional EDI workshops can be impactful, they may not suit all learners equally. Research has suggested that diversity programs by-in-large tend to aim to control the training participants' behaviour (Dobbin and Kalev, 2016). As a result, this can backfire by ultimately triggering bias rather than fully informing and explaining said bias as people push back against challenges to their autonomy. It is further proposed that a solution to this would be to engage people in working for diversity by having participants engage with those affected by these biases more prominently. Furthermore, for people to learn it is required that the learner come to accept and embrace differences (Kolb and Kolb, 2005), be they a difference in the learner's knowledge, differing beliefs and/or differing life experiences. Creating safe spaces for diverse learners is core EDI workshop goal. Serious games are interactive, immersive digital experiences designed for educational purposes and can offer an alternative or help supplement workshops learning in these areas. This paper introduces *Pronouns in Practice*, a serious game designed to be used within higher education workshop environments, including staff training and help complement EDI initiatives by simulating real-life interactions involving pronoun use, in a risk-free and engaging virtual environment.

2. Serious Games in EDI

Serious games have been increasingly recognised as powerful tools in education and professional training, offering a unique balance between engagement and learning and can educate the user in a wide range of ever-increasing learning topics (Boyle *et al.*, 2016). In the context of EDI, games can offer participants an opportunity to experiment with their perceived correct responses, help participants explore diverse perspectives, and simulate sensitive social interactions without real-world consequences. Studies have demonstrated that such digital environments can foster empathy (Ferreira *et al.*, 2021) and provide a safe space for making mistakes. This is an essential component of learning in socially delicate areas such as gender identity.

For participants who may find direct role-play daunting, serious games can offer simulated interactions in which users control their pace and engagement levels. *Pronouns in Practice* is designed to digitalise key elements of these types of workshops, offering an experience that is consistent, repeatable, and accessible across different settings and demographics.

2.1 Previous Games on EDI and Pronoun Learning

EDI is a large, complicated umbrella-like term which is used as a buzz acronym that mitigates its complexity. While serious games have been widely explored as tools for teaching a variety of topics related to EDI, a clear gap exists in games focused on pronoun usage and inclusive language. Moreover, there is a distinct lack of empirical evidence associated with the use of serious games in EDI topics and in the serious games academic discipline in general. Although games exist in EDI related subjects, their discovery in academic databases is difficult if specificity in search terminology is not used (Hainey *et al.*, 2024). This gap may be due to the perceived sensitivity or complexity of the topic, which can make it difficult to design engaging learning experiences. Another challenge is balancing respectful representation with the risk of reinforcing stereotypes.

Through researching existing serious games and related literature, no examples were identified that explicitly focused on pronoun use as a primary learning objective. While some touch on broader themes of identity or inclusion, this specific topic remains largely unaddressed. However, several adjacent projects were found that addressed pronoun usage partially or tackled the idea of creating safe spaces for learning sensitive social topics, and how design choices such as perspective-changing and narrative branching can contribute to reflection and self-learning. The following projects are included as examples of related work that explore similar themes, including identity, inclusion and learning through serious games:

A serious game project produced two games; *Change Perspective* and *Diverse Perspectives* (Peters Rit, Volk and Hauptmann, 2024). In the former, users experienced scenarios from two points of view - from that of a Dutch student and then from a German student's perspective with the goal of encouraging users to understand and reflect on different cultural experiences which could aid in a better cultural integration experience. Gameplay is narrative-driven, with choices leading to multiple endings.

Building on the foundations of *Change Perspective*, the researchers later developed *Diverse Perspectives*, a more refined game featuring a wider range of scenarios, including one that specifically addressed pronoun use. In *Diverse Perspectives*, users could select an avatar from three predefined options (female, male and non-binary) and engage with branching dialogue in a 2D visual novel format, similar to the approach used in *Pronouns in Practice*. Notably, the researchers observed a difference between what users said they would ideally do in scenarios vs. the actions they chose to do, a finding that highlights the importance of reflection in scenarios where sensitive social interactions take place.

Additionally, while *Diverse Perspectives* found that switching perspectives increased the nuance and reflection in the gaming experience, *Pronouns in Practice* chose not to implement player avatars, opting to embed the user's presence in the game within the dialogue used. This was in part due to the challenge of representing a full range of diverse identities adequately within the scope of the development. Allowing names within the dialogue allows NPCs (non-player characters) to directly reference users by name thus allowing for a personalized narrative experience. The addition of a "Narrator" allows us to further deepen the scenario by offering qualitative descriptors of how the user's actions have affected the NPCs (how they look after an option is chosen, actions taken such as leaving a room etc.).

An adjacent study was performed to examine interpersonal communication between users while participating in a grouped game experience with the game touching on sensitive topics of diversity and inclusion (Balan, 2024). Using a serious board game and a pre/post interview process, the researcher found the most acknowledged traits that helped dialogue between users (in-order) were; active listening, self-awareness and empathy. It was noted these traits helped create trust and safety between users and helped them engage more in vulnerable conversations.

Another serious game project that had elements of EDI training was that of *Path to Understanding*, a 2D adventure RPG and puzzle game created to address the realization of microaggressions in a hospital setting and how one might respond to microaggressions (Xu, 2024). *Path to Understanding's* objectives align with this paper's serious game in that the researcher's intent was to create a story-driven serious game that integrated interactive and decision-making elements with a goal of fostering skills such as empathy and self-awareness. While the thesis did not include an empirical evaluation or assessment framework, it presented a strong theoretical case for using serious games to foster empathy, improve learner engagement and support long-term

behavioural change. The researcher compares the limitations of traditional EDI training with the potential strengths of serious games, emphasizing the value of immersive environments.

3. Design and Development

The design of *Pronouns in Practice* is guided by knowledge from the creation of serious games previously in educational contexts, alongside established theoretical game-based learning frameworks. By simulating real-life scenarios with branching outcomes, the game promotes adaptive learning (Kolb, Boyatzis and Mainemelis, 2014) by allowing the user to experience a scenario and affect how a scenario might end, depending on their choices. Having this choice allows the user to learn from interactions within the game, offering the user constructivist learning in that they can then adjust their full understanding via feedback and reflection the game provides them at the end of a scenario.

The game aims to recreate EDI workshop scenarios in a digital context, providing structured interactions that simulate real-life conversations regarding pronoun use. By integrating educational content into branching dialogue and contextual scenarios, users are encouraged to consider the impact of their choices. Central to the design philosophy is modularity and adaptability. The game is being developed with the intention of being a persistent learning tool, one that learners can return to over time to refresh their knowledge or engage with new material. Initially, two to three scenarios will be developed and included in the prototype. These will be based on common missteps and teachable moments drawn from real-world EDI training.

An outline of the game's design framework, along with some design principles followed are provided below:

The first two stages of our framework are Project Origin and Project Selection. These stages are the acceptance of a project with Project Origin being the general idea that has been given (create a serious game that does x) and Project Selection being the more refined output of several ideas as to how the original idea could be output as a serious game (the type of genre the game could be, platforms it could be deployed on etc.). During these stages the original concept is expanded to offer choice to the original idea holder since being the subject experts means they might be able to offer insight into how the topic has been learned previously. For most serious games, you can break down the key functionality into two groups our framework uses; teaching games or testing games.

Teaching games refers to a game that's primary function is to impart knowledge on to the user. This knowledge is outlined by our subject experts, pertaining to learning outcomes the original idea holders themselves have. These games usually have a small part for reinforcing the knowledge via a test, but it is not the main structural part of the game, gaining the knowledge is.

Testing games refers to a game that's primary function is to test the user on assumed knowledge that is present before they start the game. The game's objective here is to highlight weaknesses and gaps in the user's knowledge base by testing it and giving useful feedback when the user is wrong.

For example, *Pronouns in Practice* will provide feedback when a user has made an answer but due to the complexity in language and dealing with sensitive topic matters, we do not enforce the feedback as a binary right/wrong function. The game's primary function aligns with a teaching game more, as its primary function is to allow knowledge to be imparted with no prior knowledge needed.

The third and fourth stage are initial constraints; Initial Meeting and Initial Scope. These stages are some of the most important in the design and development process. These stages allow us to outline the limits in scope, time and other resources, such as correspondence with subject experts. This is also where the subject experts will start to fully understand what might be asked of them to provide for the serious game to function.

The fifth stage is Development, and this is the largest of stages. Cycling back constantly in this stage with added feedback from stakeholders and subject experts with their input allows the game to provide an experience that all involved are happy with.

The sixth stage being End Product allows us to decide the finality of the scope of the serious game and separates it from the final stage for a couple of reasons, namely due to the modularity of having maintenance cover only a specific development cycle of the game. Maintenance can be a repeatable stage here, covering for instances of the serious game no longer working due to technical upgrades. The seventh and final stage is End Project or End Phase. This allows us a checkpoint to stop and look back from. Any evaluation on the development itself would be done here along with a review of all that happened before this.

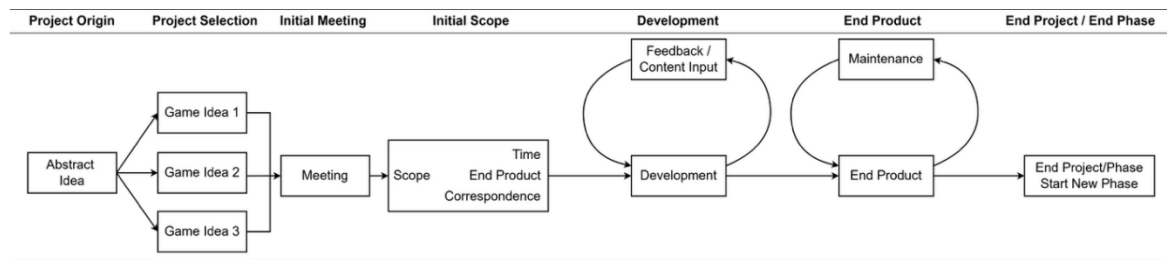


Figure 1: Diagram of framework followed

4. Implementation

To set the groundwork for long-term adaptability and user-driven content creation, two phases of the project were created and worked on in parallel. The first phase being the main base game, with pre-built scenarios already designed that helps simulate common real-life situations involving pronoun usage. Phase two was the development of a scenario editor, a tool that will allow educators to create, customise and modify scenarios to suit their specific learning objectives. A breakdown of both phases are as follows:

4.1 Phase 1 - The Base Game with Pre-Built Scenarios

Pronouns in Practice is a 2D visual novel-style serious game designed as an educational tool to support inclusive communication and discussion in a workshop environment through interactive scenarios. *Pronouns in Practice* is being developed using the Unity game engine, selected for its cross-platform capabilities and deployment options. Unity allows the developer to create builds for a range of technologies including Windows, macOS, and mobile platforms, ensuring broad accessibility and ease of dissemination within varying technical resources.

Consultation was initially done with a subject expert EDI Coordinator to help build the scenarios. Drawing upon their experiences delivering EDI workshops, the EDI Coordinator provided valuable insights into common real-world issues and sensitive scenarios including pronoun usage. Their expertise ensured that the scenarios created were authentic and reflected workplace realities used in workshops already thus helping the game's design to be of best practice. The game will allow the user to be in or watch a narration take place, with sections asking for user input as to what they or the point of view character should do in that situation. The scenarios are as follows:

Scenario 1: The Presentation - The user is in a professional setting where they witness a colleague, Hannah, accidentally misgender Alex after a presentation. The user sees an interaction play out and helps Hannah decide how to correct herself in the moment.

Scenario 2: The Team Meeting Mix-Up - The user is in a professional setting where they accidentally misgender a colleague they line manage, Jack, during a team meeting. The user has no choice but to misgender Jack in this scenario to enable them to make a choice on how to proceed when they make a mistake. Jack is a transgender man who the user knew before he began his transition. The user must decide how to correct themselves in the moment and how to address it afterward.

Scenario 3: Colleague Misgendering Incident - The user is in a professional setting where they witness a colleague, Ben, misgender another colleague, Hayley, in the office. The user line manages both colleagues. Hayley is a transgender woman who is new to the organisation. The user must decide how to manage the incident in the moment and how to address it afterward.

Game Mechanics

For game mechanics we have adapted a simplistic approach, not wishing to over-complicate the user's experience. A menu screen will allow the user to enter a given scenario. Clicking the "continue" button once the full dialogue of a person has appeared on the screen will continue the scene forward (Figure 2). At a branch path (i.e. when the user must decide) the choices will appear as buttons on the screen, allowing the user to choose only one (Figure 3).

Once a scenario has been completed the user will see a feedback screen (Figure 4). This will provide reminders to the questions asked, the answers given and appropriate feedback. This section will also provide additional open questions to the user that could help further conversation in a workshop setting.

Visuals

For visuals, we have focused on the scenes being simple in design to set up. A 2D background sets the scene appropriately for the location it is being set in. NPCs will appear in one of three locations: to the left, centre or right. This will allow the user to interpret a conversation between several characters at once. As of the prototype, these NPCs will be represented via 2D images/sprites. This will allow easier customisation when the scenario editor is created. A light transparent effect has also been used to emphasise the current speaker.

Interfaces

For user interfaces, we have elected to keep it simplistic. A main menu screen will present the user with their choice of scenario, with a small synopsis for each. When in a scenario, the user clicks the continue button to proceed through the dialogue. For dialogue display, what a character is saying is shown prominently along the bottom of the screen, along with their name to the upper left of the dialogue. This allows the dialogue to be large enough to pull the user's focus but not take up too much space that the NPCs and background are ignored or occluded (Figure 2). When a question is asked, the user cannot continue the scene until an answer is clicked. The game leaves the previously said dialogue line visible at the bottom of the screen so the user can fully realize their answer (Figure 3).

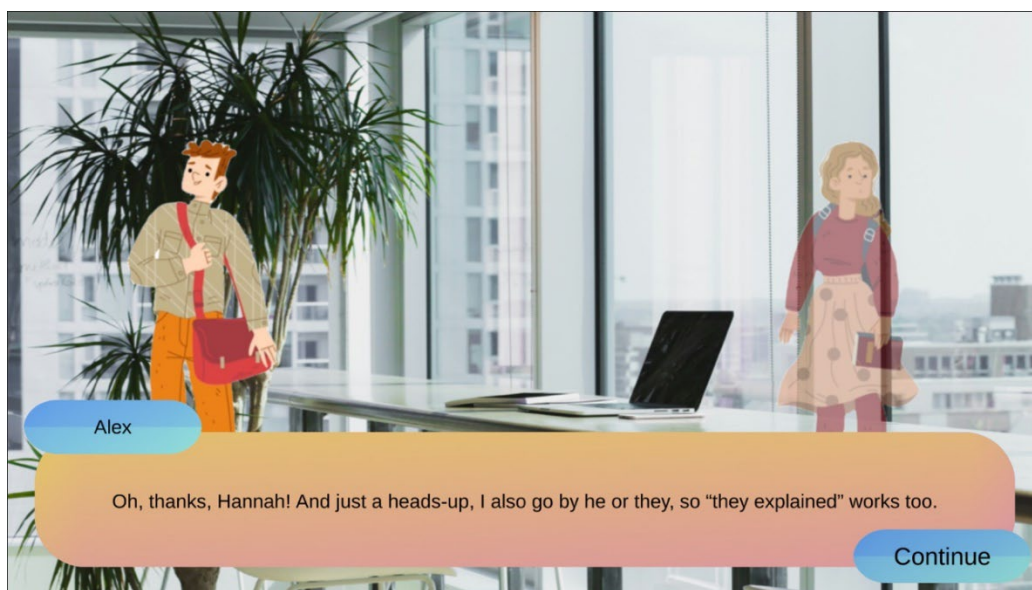


Figure 2: Alex is responding to Hannah

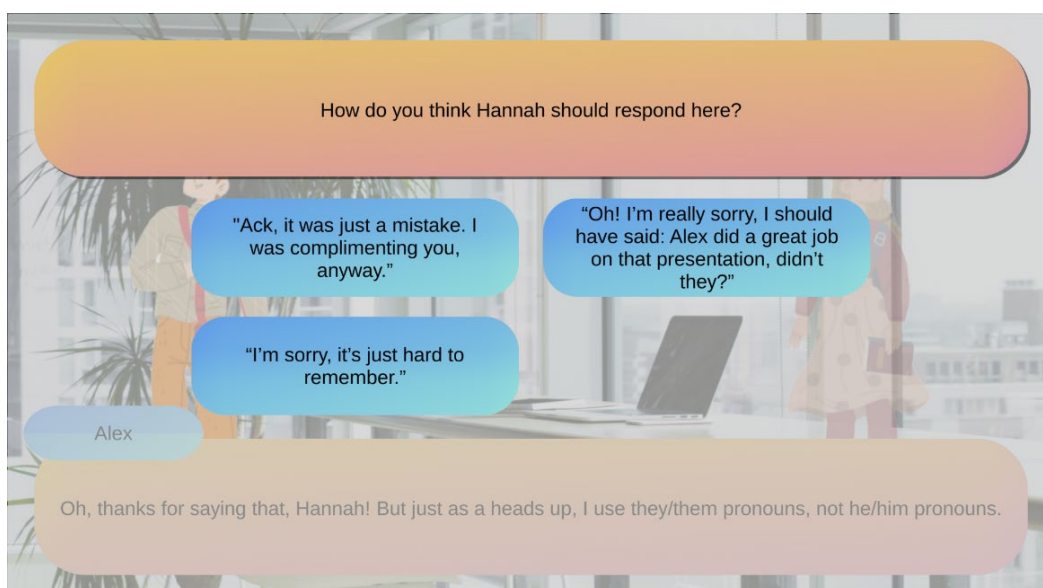


Figure 3: Example of a question

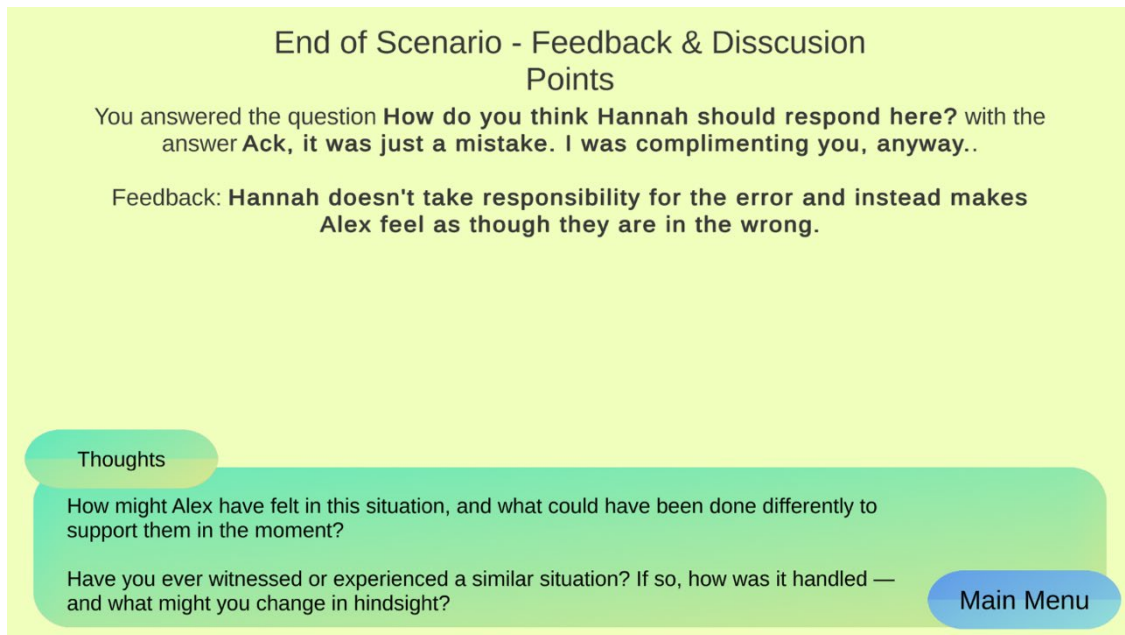


Figure 4: Example of the feedback screen

4.2 Phase 2 - The Scenario Editor

A key aspect of this project was to offer not just a tool with predefined scenarios but to allow some aspects of the scenarios to be customisable. This type of tool aims to ensure the game remains adaptable and future-proof. Drawing upon the idea of Gee's "Insider Principle" (2003), the editor empowers users to move beyond passive consumption of the content and take on active roles in the creation of scenarios. The idea being that learners can deepen their engagement when given the opportunity to customise within any given learning system. This type of flexible editing will allow educators to expand and tailor scenarios to their own pedagogical goals and the specific needs of their learners.

An editor such as this, which allows for the creation and modification of scenarios, also places the power of discussion and representation directly into the hands of the educators delivering the EDI workshops themselves. Another benefit to such an editor is that having this level of customisation means the tool can evolve alongside social discourse and institutional needs. The scenario editor supports more than textual content changes and allows for the changing of visual content such as character 2D sprites and the scene background enabling the creation of diverse scenarios that reflect a broad spectrum of identities and social contexts. Through using this approach, the tool becomes more than just an add-on to the game; it transforms it into a participatory educational tool ensuring that discussions around gender identity, pronoun use, and inclusive behaviour can remain relevant and flexible to evolving conversations and social norms. As this game and tool progresses, the goal is to simplify this editing process so that an educator can change a structured spreadsheet and output a file that the game will be able to read at runtime. By enabling this type of interaction, we allow educators to craft their own unique, context-sensitive experiences. A work-in-progress version of the spreadsheet contains 3 different tabs. They include:

Editor - The main tab of this spreadsheet and the one the user will export from; this is an empty template of what is needed for a scenario. We have provided notes on relevant cells to help with the data input. Formulas have been used to add extra ease to creating the file needed for the scenario to work in the game. For example, the educator simply needs to put a number in the bordered box next to "Total number of NPCs in scene:" and the spreadsheet will add $\text{NPC}(0..n)$ where n is the number they entered into the column while also highlighting green the field they must now fill in with names of NPCs in the scene. This list will then create an easy-to-use dropdown, allowing error catching throughout the spreadsheet.

Example - This tab is provided to allow the users a look at a fully realized scenario giving them an example of one already implemented, to help them in their own scenario creations. For this we have recreated "Scenario 1: The Presentation" via the spreadsheet (Figure 5, 6).

Help and Notes - The final tab will provide help and advice as to how to create your own scenario. This tab will hold developer-specific needs from the user of the spreadsheet for it to work properly with the game. An

example is that the user's name can be inserted into dialogue sentences in the game but to know where to do this the spreadsheet user needs to use "[USER]" for the program to understand the insertion.

Scenario Editor for Pronouns In Practice						
This sheet will use Scenario 01 as an example						
Dialogue Section						
Dialogue No.	Dialogue/Question	NPC Speaking	Location	Dialogue Line	Skip To	End
1	Dialogue	Narration	Center	*Alex finishes the presentation*		☐
2	Dialogue	Hannah	Right	Hey [USER], Alex did great job on that presentation, didn't he?		☐
3	Dialogue	Narration	Center	*Alex looks at [USER], a little surprised at what Hannah had said.*		☐
4	Dialogue	Alex	Left	Oh, thanks for saying that, Hannah! But just as a heads up, I use they/them pronouns, not he/him pronouns.		☐
5	Question	Narration	Center			☐
6	Dialogue	Narration	Center	*Alex exits the room. They seem tearful and distressed.*	11	☐
7	Dialogue	Alex	Left	"Thanks Hannah, I appreciate you correcting yourself!"		☐
8	Dialogue	Narration	Left	*Alex exits the room.*	11	☐
9	Dialogue	Alex	Center	"I'd like it if you could try."		☐
10	Dialogue	Narration	Center	*Alex exits the room.*		☐
11	Dialogue	Narration	Center	*Hannah seems to take a moment to think about her response, then turns to [USER]*		☐
12	Dialogue	Hannah	Right	Hmm. Perhaps we could practice using Alex's pronouns together, [USER]? I think that would help me to start getting it right.		☐
13	Dialogue	Narration	Center	[USER] smiles at Hannah and nods.		☒

NPCS		SPRITES	
Total number of NPCs in scene:	2	WIP, Will add ability to change sprite images	
NPC1	Narration		
NPC2	Alex		
NPC3	Hannah		

Figure 5: Work in progress Scenario Editor

Question Section							
Question Asked	Answers (up to 4)			Answer Jump To (up to 4)			Feedback (up to 4)
How do you think Hannah should respond here?	"Ack, it was just a mistake. I was complimenting you, anyway."	"Oh! I'm really sorry, I should have said: Alex did a great job on that presentation, didn't they?"	"I'm sorry, it's just hard to remember."	6	7	9	Hannah doesn't take responsibility for the error and instead makes Alex feel as though they are in the wrong. Hannah understands she made an error and apologises, then corrects herself. Hannah does apologise but doesn't really take responsibility for the error.

Figure 6: Work in progress Scenario Editor

5. Conclusions and Evaluation Plans

This paper has provided an overview of the development of *Pronouns in Practice*, a serious game designed to address the challenges of pronoun usage and promote inclusivity in educational settings. By simulating real-life interactions through a series of branching dialogues and scenarios, the game allows users to practice engaging with diverse identities in a risk-free environment. We have also outlined a design framework that was used to guide this development. As highlighted previously in the paper, traditional EDI training methods may not always be comfortable or effective for all learners, particularly when it comes to addressing sensitive topics like gender identity and pronouns usage. Serious games offer an innovative and engaging alternative, fostering empathy,

encouraging self-reflection and can help provide a safe space for experimentation without real-world consequences.

The game is currently in its final stages of development, with its core game mechanics and an initial scenario completed. The scenario creator tool, while still a work in progress, is expected to be finished prior to evaluation with participants.

To evaluate the effectiveness of *Pronouns in Practice* and to further explore the potential of serious games in supporting EDI training, we will conduct a dedicated workshop. The game itself will be presented and tested at the workshop at the University of the West of Scotland in June 2025. This workshop is an integral part of the game's development, offering an opportunity to engage participants, primarily educators and subject experts from the higher education sector, in a structured and reflective session. The workshop will centre around two EDI areas: British Sign Language (BSL) and pronoun usage. Our goal is to create an environment in which participants can interact with complex social topics through low-risk and engaging serious games experiences.

The workshop will begin with a presentation introducing core terminology, key concepts, relevant literature and the introduction of our serious games. Participants will then play two serious game prototypes, including *Pronouns in Practice*. This hands-on segment will allow them to experience the scenarios that have been designed. Following this a debriefing session will follow, encouraging open discussion about the educational value of the games, their realism and their potential applications within the participants' own institutional contexts and needs. By providing a structured space for guided conversation following the simulated scenarios, we aim to foster an environment that encourages dialogue around the sensitive issues, namely pronoun usage and inclusive practices. These post-game discussions are designed to promote an exchange of thoughts, deepen participants' understanding of their own choices and offer insight into how others engaged with the branching dialogues. We hope to support valuable self-reflection and interpersonal learning, building on the emotional and cognitive experiences gained playing the serious game. Feedback from these sessions will be used to refine both the game and the scenario editor tool, and to explore the game's future potential in broader EDI training contexts.

The evaluation in relation to future empirical evidence will take cognisance of the fact that there are two groups that will benefit from the serious game. Firstly, the users who will be educated using the game and secondly the instructors that will customise the scenarios to use in sessions. Evaluations will focus on learning effectiveness and usability and customisation of the scenarios alongside assessing shifts in participants' confidence, awareness and attitudes regarding pronoun usage and inclusive communication.

Evaluation will be a mixed methodology to collect both qualitative and quantitative data. In relation to learning effectiveness this would be a Randomised Controlled Trial (RCT) with a pre-test/post-test experimental control group. A control group would learn in a normal session without exposure to the tool and an experimental group would learn with the tool. Data will be collected through valid questionnaire instruments analysed with descriptive and inferential statistical techniques. The data will be tested to ascertain conformity for parametric analysis i.e. normality of distribution, homogeneity of variance and interval or ratio data. If this is the case, then dependent (within) and independent t-tests (between) will be used for comparisons. If not, then Wilcoxon-matched pairs signed ranks tests (within) and Mann-Whitney U tests (between). Instructor evaluation will be performed through focus groups and semi-structured interviews to collect detailed information on usability, customisability and effective integration.

Future workings include using participant feedback to better the scenario editor, focusing on usability and addressing any obstacles participants find in creating their own scenarios. In the future, we hope to expand the game's reach and collaborate with additional stakeholders to further develop the tool and assess its impact in educational settings. Another expansion could also be to focus on a larger range of diversity-based scenarios; cultural differences, disabilities and other parts of identity such as sexual orientation. Through continued refinements and input from additional stakeholders, *Pronouns in Practice* aims to contribute to a more inclusive and understanding environment in educational institutions and learning.

Ethics Declaration: Ethical clearance was not required for this research but is being sought out for the planned workshop.

AI declaration: AI tools were not used in the creation of the paper.

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