Investigating the Role-play Technique in Educational Game Designing Process

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Abstract: Educational games (EGs) frequently fail to reach the classrooms they are designed for, and the absence of teachers from the design process is consistently identified as one reason. Participatory design (PD) offers a route to addressing this, but in educational game contexts it has largely positioned children as design partners, with teachers appearing as gatekeepers or evaluators rather than as designers in their own right. In Australia, interdisciplinary exchange between educators and the games industry remains largely undocumented. This paper therefore asks what design knowledge primary school teachers and professional game designers make explicit when placed in structured conversation with one another, and how exchanging roles changes what each group articulates. Three paired co-design workshops, each pairing one teacher with one game designer, were conducted via Zoom with six Australian participants. Within a design thinking (DT) framework, every session ran three scenario-based role-plays: participants first played themselves, then teachers role-played their students, and finally both groups exchanged roles. Data were coded thematically and interpreted through Dewey's theory of experience. The three configurations elicited distinct kinds of knowledge: a client-centred exchange in which designers drew out teachers' requirements; an account of player psychology when teachers spoke as students; and a reciprocal negotiation, marked by initial hesitation, once roles were reversed. Within the bounds of a small purposive sample, the findings indicate that role-play is a fast, low-cost technique for surfacing tacit design knowledge across a professional boundary that is rarely crossed.

Keywords*:* Participatory design, Co-design, Role playing, Educational games design, Designing process, Design thinking, Game designers, Teachers

1. Introduction and Relevant Literature

Games are commonly understood as entertainment, but under the right conditions they also support teaching (Gee, 2007), and are widely identified as motivating tools for developing 21st-century skills. Mastering new challenges, learning through trial and error, and repeating tasks to consolidate understanding have all been associated with positive learning outcomes (Barab et al., 2012, Young et al., 2012). Evidence linking game design to those outcomes nevertheless remains mixed (Young et al., 2012). The Games' Usefulness Model for Classrooms (GUMC) offers teachers a way of identifying useful classroom games, addresses the obstacles teachers encounter, and shows how games can be matched to course learning and thinking (Stieler-Hunt and Jones, 2015a, Stieler-Hunt and Jones, 2015b, Kirriemuir and McFarlane, 2003). (Stieler-Hunt and Jones, 2015a)

1.1 Why Educational Games Fail to Reach Classrooms

Recent studies have highlighted the importance of both student and teacher perceptions in the classroom. These studies span the learning environment, engagement and motivation strategies, and comparisons of student and teacher perceptions — which often diverge considerably. Researchers must therefore position teachers and students as central actors in the learning environment(Könings et al., 2014a). (Varea and Ndhlovu, 2017)

Globally, many EGs have been created or produced, but only a limited number of them have emerged within the gaming industry (Hamdaoui et al., 2019). Numerous reasons could justify this (Gunter et al., 2008, Kim et al., 2017):

- EGs do not provide an optimal balance between educational content and gameplay,
- The combined value of gameplay and learning content is mismatched (focus on quality of design - the looks – rather than the learning),
- Lack of involvement of teachers and educators in the process of designing,
- Overly prioritizing the seriousness (learning content) and reducing the fun element, which leads to demotivated players.

1.2 Participatory Design in Educational Game Contexts

Engaging with players — the end-users of a game system — has become essential in the games industry. Involving end-users in design has produced positive outcomes across many fields, including game design (Tuhkala, 2019, Lange-Nielsen et al., 2012, Khaled and Vasalou, 2014, Dodero and Melonio, 2016), , and participatory design (PD) research draws on relevant stakeholders to investigate a phenomenon and extend

knowledge (Konings et al., 2014b). End-user requirements therefore deserve attention — not only those of student players, but of the teachers and designers who also engage with the system. PD and co-design approaches are accordingly emerging in serious game and EG design (Tuhkala, 2019, Könings et al., 2014b, Könings et al., 2007, Könings et al., 2017). Co-design activities have been shown to improve communication between stakeholders and reduce designer bias (Vines et al., 2013, Muller and Kuhn, 1993, Muller and Druin, 2012), , although interdisciplinary studies are demanding to establish and time-consuming (Könings et al., 2014b, Könings et al., 2017).

Magnussen et al. (2003) applied PD to design, develop and evaluate a game development process in which children aged 11–12 acted as designers of the game concept and teachers presented it. They reported conflicting interests: although PD deepened teachers' understanding of their students' perceptions, teachers doubted that children could grasp the educational goal and were therefore unsupportive (Magnussen et al., 2003). Similarly, Könings et al. (2011) examined whether PD could reduce incongruence between student perceptions and teacher instruction, and reported positive outcomes as disagreements were collaboratively surfaced.(Könings et al., 2011) Khaled and Vasalou (2014) argued for bridging serious games and PD in order to draw on players' existing knowledge and worked with three children aged 10 across a series of workshop sessions. They reported mixed outcomes — creative ideation and freedom of choice on one hand, unrecognised conflict between participants on the other — and captured the students' scepticism in the remark that "Teachers are strict, and the game will not be fun" (Khaled and Vasalou, 2014). Konings et al. (2005) extended this line of work(Könings et al., 2005) by combining the perspectives of designers, teachers and students in a Combination-Of-Perspectives (COOP) model, which acknowledges the distinct contribution of each: instructional designers supply materials and pedagogical approaches, teachers build the learning environment, and students shape it through their perceptions and learning outcomes(Ahmad, 2021, Ahmad, 2022).

Across this body of work, children are the design partners. Teachers appear as gatekeepers, presenters or evaluators rather than as designers in their own right, and where multiple perspectives have been combined this has been done conceptually rather than through direct encounter between the parties.

1.3 The Australian gap

As collaborative research expands, the role of EG design stakeholders and of academics supporting PD research has become more prominent. The Australian games industry, however, has not yet explored interdisciplinary knowledge exchange or PD approaches (Keogh, 2021), even though the EG design process demands precisely this kind of collaboration if successful games are to reach schools. This is the gap the present study addresses: it brings practising primary teachers and professional game designers into direct conversation, in a national context where such exchange remains largely undocumented (Keogh, 2021, Keogh, 2019).

PD tools are well established in design research, and design games have more recently shown their capacity to let stakeholders share experiences and ideas for improving games (Brandt, 2011, Brandt et al., 2012, Ahmad, 2024a). Published work sets out the requirements associated with design processes and educational games (Kalmpourtzis, 2018, Salen and Zimmerman, 2004), though positions differ on whether games facilitate the design process or are its end-product (Ampatzidou and Gugerell, 2018, Konings et al., 2017, Ahmad, 2023, Ahmad, 2024b).(Brandt et al., 2012, Brandt, 2011, Ahmad, 2024a, Huizinga, 1955, Kalmpourtzis, 2018, Salen and Zimmerman, 2004, Mekler et al., 2018, Ampatzidou and Gugerell, 2018, Könings et al., 2017, Ahmad, 2023, Ahmad, 2024b)

Taken together, these gaps motivate the workshop method reported here: a collaborative space in which teachers and game designers articulate their roles and perspectives on EG design — as users, as designers, and as adaptors of existing EGs. The study forms part of a larger project examining the roles and perspectives of game designers and primary school teachers in the EG design process.

2. Theoretical, Conceptual, and Methodological Approach

The conceptual and theoretical frameworks adopted in this paper relate to Dewey's experience theory (1938): growth of experience, purpose, and continuity. Since these concepts are related to research epistemology and ontology, constructivism is used as a model for constructing new knowledge that welcomes the subjectiveness of individual experiences (Dewey, 1938).

Growth of experience describes how a person develops through everyday activity — gaining knowledge, pursuing objectives, and refining their understanding of phenomena over time. Growth is driven by the desire to formulate a purpose, which in turn returns to experience through the exercise of intelligence. For Dewey,

purpose is bound to freedom: "…*which identifies freedom with power to frame purposes and to execute or carry into effect purposes so framed. Such freedom is, in turn, identical with self-control; for the formation of purposes and ththe organization of means to execute them are the work of intelligence*(Dewey 1938, p.67). Purpose begins with an impulse but is always accompanied by an end-view — *"the foresight of the consequences that may result from acting upon that impulse"* (1938, p.67). Teachers make meaning through action, reflecting continually as students play or are assessed; game designers reflect comparably on their own practice. Th

The principle of *continuity* holds that each past experience shapes the future experience of the individual. *Interaction*, by contrast, refers to the situational and teacher influences on a student's experience. Dewey argues that interaction and the situation in which it occurs are *"inseparable from each other" (1938, p.41). He cautions*, however, that not all experiences are *"genuinely or equally educative"* (1938, p.13). Teachers must therefore understand the nature of experience and how it shapes a learner's present, future, and capacity to contribute to society. Similarly, game designers shape educational game experiences by attending to players' and designers' perspectives on the design process. It is therefore important that teachers and game designers recognise how experiences shift over time: an experience may be enjoyable without contributing to growth, and without continuity it provides no cumulative basis for future learning.

This has a direct methodological consequence. If experience is continuous and situational, it cannot be reported reliably by asking practitioners to describe it in the abstract; it has to be enacted before it can be examined. Role-play offers a means of doing so. By placing teachers and game designers in a scenario and asking them to act within it, the technique externalises experience as it is used rather than as it is recalled, making Dewey's principles of continuity and interaction analytically available in the transcript. This is the rationale for the workshop method set out in the following section.

3. Data Collection, Analysis, and Interpretation Approach

3.1 The Collaborative Design Workshop Method

Because PD enables the co-discovery and co-construction of knowledge between experts, this paper reports the range of ideas and reasoning through which participants' experience unfolds(Muller et al., 1993). The wider project applies a six-stage collaborative design workshop (CODW) method: *Discover*, *Define*, *Ideate*, *Prototype*, *Evaluate* and *Reflect*. This paper reports the *Define* stage, in which participants establish the strategies and measures they would apply when creating content for their users. Role-playing is the technique used at this stage, and it is the focus of the analysis that follows.

3.2 Participants

Six participants took part: three primary school teachers and three professional game designers, based in Melbourne, Sydney and Queensland. Each of the three workshops paired one teacher with one game designer, conducted synchronously via Zoom.

This is a small purposive sample, and deliberately so. Co-design research of this kind privileges depth of encounter over breadth; Khaled and Vasalou (2014) worked with three participants, and comparable studies operate at similar scale. Recruiting practising game designers with availability for synchronous sessions during COVID-19 restrictions further constrained the sample. The claims made here are therefore analytic rather than statistical. In the sections that follow, participants are identified as teachers [T_1, T_2, T_3] and game designers [GD_1, GD_2, GD_3].

3.3 Data Collection

Audio-visual data from the three workshops were recorded, transcribed and time-stamped. Recording combined audio discussion, screen capture of the co-construction activities, and handwritten memos taken during the sessions. Participatory observation requires the researcher to engage in participants' activities while recording systematic observations (Leavy, 2022), and the observational notes were treated as a data source alongside the transcripts.

3.4 Role-play as the Technique at the Define Stage

Role-playing simulates the experience of a product or service from the perspective of its intended audience(Thoring and Mueller, 2012). Participants take semi-structured roles during the session, exchanging ideas in conversation and generating data specific to the role assigned by the facilitator.

Thoring and Mueller (2012) classify role-play epistemologically across four levels of knowledge construction. This study applies Level B, tacit knowledge: the activity is intangible, and it concerns spontaneous behaviour and intuitive reaction, with rules emerging through participants' experience rather than being set in advance. Within the same framework, this study applies role-play as a combination of creativity technique and communication tool (Thoring and Mueller, 2012, ThinkDesign, n.d.).(ThinkDesign, n.d.)

Role-play was selected on the expectation that it would open a rapid knowledge-sharing space while participants became acquainted. Section 5 examines whether it did so, and whether the tacit knowledge surfaced behaved as the Level B classification predicts.

3.5 Analysis

The study adopted a six-step thematic analysis(Braun and Clarke, 2006, Braun and Clarke, 2012), with initial hand-coding preceding in-depth analysis in NVivo. The analysis surfaces teachers' perspectives, their motivational drivers, the growth and continuity of their experience, and how they evaluate EGs before classroom use. Themes are then interpreted hermeneutically within an interpretivist paradigm, allowing both stakeholders' subjective experiences of education, classroom game use and game selection to be read against the researcher's epistemological and ontological position and against Dewey's theory of experience (1938).

4. Results and Discussion

The three role-plays were designed to elicit ideas based on the experiences of both participants while they perform a role-play. The activity aimed to surface participants' requirements, expectations and competencies as both users and designers of EGs, and to give them ownership of the ideas generated within each scenario's time limit. Semi-structured questions were used to introduce each scenario and roles.

The scenario was 'stakeholders designing EGs for primary school.' In this scenario, there were three interchanging role-plays (5 minutes for each role). The researcher reflected on the interaction that each role generated within the scenario from all three CODW, and gauge whether changes were observed due to participants' prior experiences in their practice. Repeating the same roles across participant groups allowed me to observe how participants positioned themselves as different users.

4.1 Role-Play# 1

ROLE: Primary School Teacher → **Primary School Teacher**
ROLE: Game Designer → **Game Designers**

Role-play 1: Roles did not change in this scenario, which was designed to establish a familiar and encouraging situation for both participants. Prompts covered EG aesthetics, curriculum-relevant content, how learning is delivered, and the role of positive feedback in guiding students on *how to improve if they fail, and also exploring the possibilities of what the game design can have?* Prompts were displayed via shared screen in Zoom.

From both participants' groups, discovering what makes EGs 'educational' was rather a captivating conversation. In all CODWs, participants discussed open-ended questions, and participants selected EGs for their mutual conversations including, Duolingo [COD_1], Mammals [COD_2], and Mathletics [COD_3], for fast and real-time knowledge sharing amongst themselves. In all COD sessions, game designers began questioning teachers about what *'teacher's preferences in the game are, how would an EG be designed to cater to their needs, what's the game about, and how can they help*? The answers across the CODWs varied, but most of the discussions were related to game mechanics, aesthetics, and how narrative element can demonstrate educational challenges through a game like Mammals or Duolingo. Teachers emphasized that the engagement levels depend on positive reinforcement, and the levels of learning should depict gradual increment, allowing the players to visualize their achievements. As suggested by [GD_1], "*choosing an adventure to learn a language rather than doing a repetitive play can potentially remove boredom!*"

GDs positively endorsed the idea that learners can enhance their internal motivation for learning a language through a choice-based approach, which has multiple adventures to choose and embark upon. Other mechanics such as the amount of control the player has and specific goals assigned to complete the task, "*adaptive challenges that can accommodate diverse learning needs and abilities for students*" [T_2]. Furthermore, participant suggested a need of inclusivity through designing process is required to accommodate diverse learning styles and abilities (average learners, below average, or gifted learners), which was prominently discussed in design to meet differing learning and developmental styles (Carlson, 1991). Furthermore, teachers wished that all games should have interactivity and a multi-sensory element (options of audio, video, adjustable sounds, and verbal reading) as interaction *adaptability* through the interface. Furthermore, teachers asserted

that students' choices and progress need to be tracked or 'saved' for the teachers to assist in their assessment of each student's performance during play.

While GDs acted largely as listeners, teachers readily offered requirements and insights for EG design. A concern raised by teachers throughout the conversations was that students should be able to play autonomously while game designers addressed how that's suitable in the design (see quotes below). This way, players attain their engagement level while obtaining their data *through play,* which the teachers monitor to learn about each students' progress. Figure 1 shows a snippet of [COD_1] conversation during role play to view full quotes for the points discussed above.

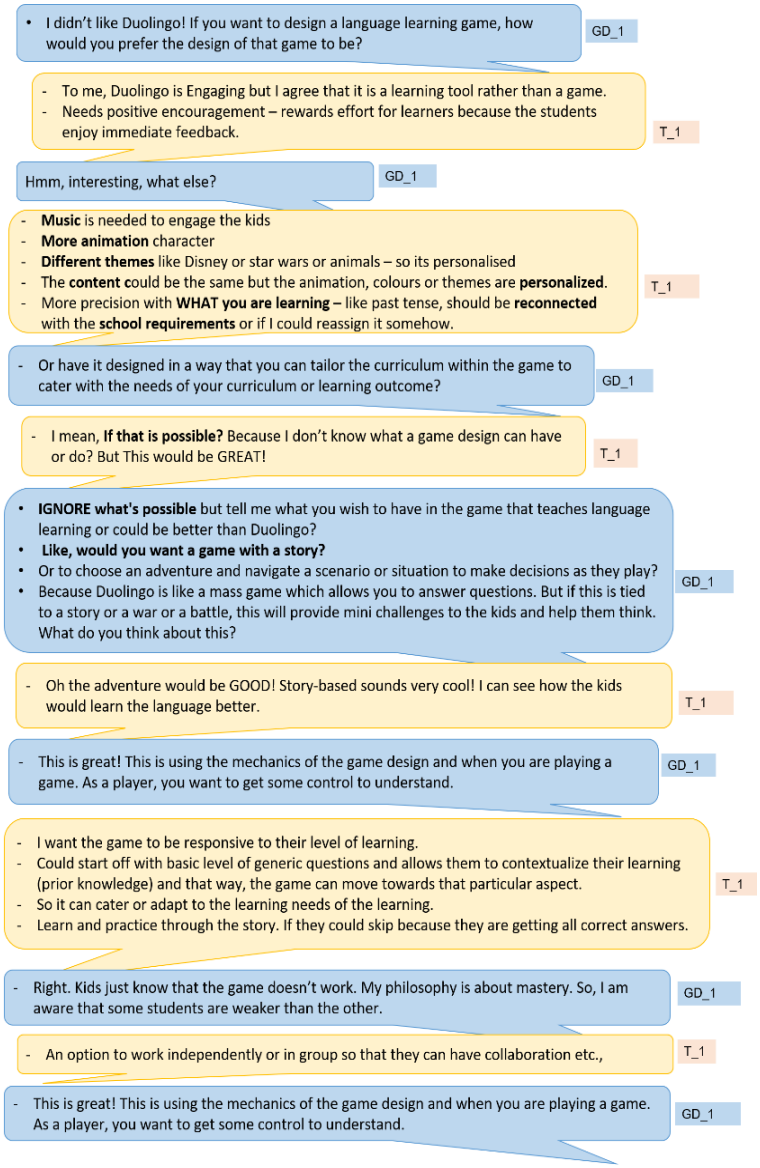


Figure 1: Shows sample role-play#1 accumulated result based of [COD_1]

[T_3]: Teacher's role becomes 'invisible' when a game fails in the classroom because teachers do not wish to babysit the students' playing games.

[GD_3]: I think that the fundamentals of psychological principles here is that autonomy is used.

4.2 Role-play# 2

ROLE: Primary School Teacher à **Primary School Student**

ROLE: Game Designers à **Game designers** *Understanding Primary Students need.*

All teacher participants had similarities between what all the teachers reflected as students' perspectives. The first evolving idea that all teachers mentioned was that games need to provide a variety of tasks as they play, "*a lot more stimulation and variation in the type of activity… whether its clicking or doing something physical*" [T_1],

and "*I love exploring games…I want heaps of quests, so it's more fun*" [T_3]. GDs were intrigued to listen to what the teachers explained while they played a role as students because they have yet to experience such playtesting or feedback from students as players before. Teachers added that there is a need for "*stability in the way the tasks are designed because of the cognitive needs of children as they are not all the same*" [T_1], "*so you observe your students in your classroom?*" [GD_1], "*Yes!... same cognitive level assumption is really wrong! They are all different at a year difference in their age"* [T_1]. At tThis raises the question of how cognitive development maps onto the age bands defined early in the design process. addition to the variety of tasks that provides a stimulating learning environment, teachers stated that "*students prefer a gamified world that includes instant and colourful feedback, audio affirmations and trial-and-error opportunities"* [T_2] and "*I want to keep trying even if I fail my maths activity 10 times!"* [T_3].

Teachers also emphasized that despite the collaborative nature of games leaving a positive impact on class group discussions and exploring facts together, all three teachers mentioned that autonomy and independently playing should always remain as an *option* in the game. This suggests that teachers closely observe their students at play - an opportunity GDs said they lacked.

> *[T_2]: Autonomy is needed so that they can work independently, and they can feel that they are a part of the whole game.*
>
> *[T_3]: I [imitating student] have no control in how I[student] learn the content, so I just want to learn one topic at once as I explore the game.*

4.3 Role-play# 3

ROLE: *Primary School Teachers* → **Game Designers**
ROLE: *Game Designers* → **Teachers**

This role exchange demonstrated how 'strange' it felt for them to switch opposite roles. One reason that was stated was that:

> *[T_2]: I have never imagined that I would have to do this.*
>
> *[GD_2]: I am struggling to think of what I would ask or ponder about… Oh, I don't know what I would ask you?*
>
> *[GD_3]: This is hard to think about.*

Striking ideas nonetheless emerged. Participants argued that a realistic game environment would let players make choices and explore freely, and that "boring" subjects might benefit from fictional framings - superheroes, alternative game worlds, or culturally grounded language settings.

Teacher pointed out that a game should adapt onto teachers' dashboard or various platforms for wider benefit of devices available [T_2]. But when the teacher and game designer suggested that "*I would probably rebadge, redesign or adapt onto an existing game then!"* it seemed to be a realistic idea for the game designer.

Figure 2 (right) illustrates a snippet of conversation between both participants (Role-play#3) how they struggled to position themselves in opposite roles; however, reflecting upon their prior knowledge or various gameplays, they mentioned meaningful suggestions.

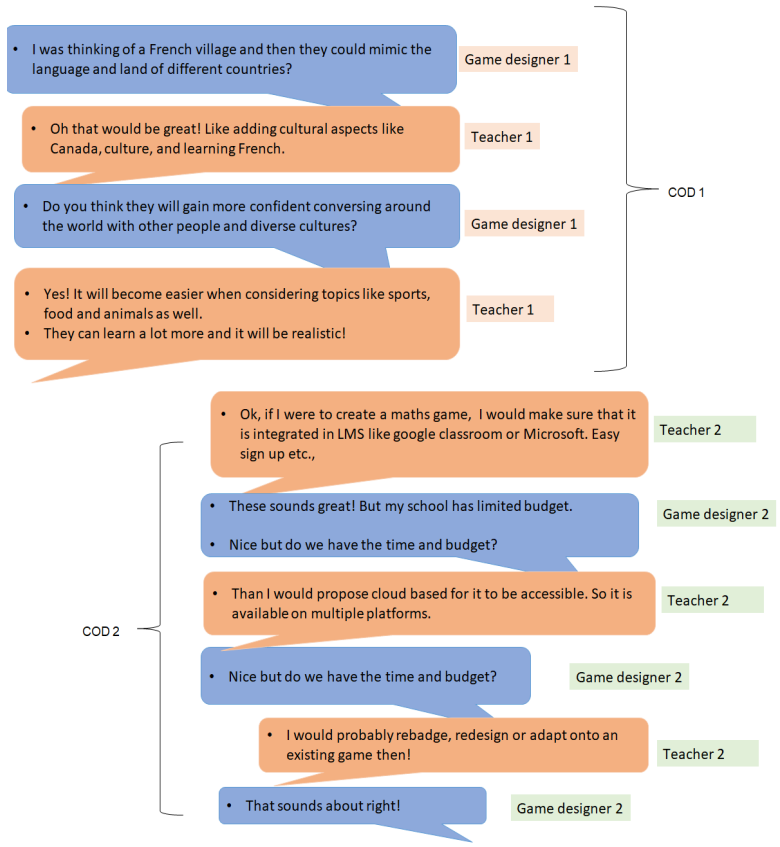


Figure 2: Shows sample [CODW_3] accumulated result based of [Role Play #3]. Teacher 2 is T_2, and Game designer 2 is GD_2

5. Discussion and Implications

Across the three workshops, role-play evoked diverse ideas drawn from participants' experience of using and designing EGs. In doing so it surfaced a range of EG design issues, meeting the activity's aim of collaborative idea generation.

In answer to the first research question, the design knowledge participants made explicit divided along professional lines but proved complementary. Teachers articulated curriculum alignment, differentiation across learning abilities, feedback and progress tracking, and student autonomy. Game designers articulated mechanics, feedback loops, interface and navigation, and narrative structure. Neither group had previously had occasion to state these requirements to the other: designers noted they had had no prior opportunity to observe playtesting or gather feedback from student players, and teachers were uncertain what was technically achievable. Role-play made both kinds of knowledge visible in the same conversation.

In answer to the second research question, exchanging roles changed what each group could articulate. The three configurations produced distinct kinds of exchange, described in analysis section: a client-centred elicitation in which designers drew out teachers' requirements; an account of player psychology when teachers spoke as their students; and a reciprocal negotiation, preceded by visible hesitation, once roles were reversed. The hesitation is itself informative. It reflects how rarely these two groups collaborate in current EG design practice, and it suggests that tacit knowledge is not equally accessible across all role configurations — a refinement to the Level B classification, which treats tacit knowledge as uniformly emergent through spontaneous behaviour (Thoring and Mueller, 2012). Sequencing matters: the client-centred configuration functioned as an opening exercise that made the later reversal possible.

In consideration of Dewey (1938) theory, the exchange illustrates both continuity and interaction. Participants drew on accumulated classroom and studio experience rather than on abstract preference, and what each articulated was shaped by the role they occupied at that moment. In communicating, they externalised and evaluated that experience, creating new knowledge as they verbalised it (Thoring and Mueller, 2012). The result

was a mixture of tacit and empathic understanding — of how teachers view and use EGs in the classroom, and of how designers interpret that knowledge.

Three implications follow. For researchers, role-play offers a fast, low-cost technique for surfacing tacit design knowledge across a professional boundary, suited to short-term data gathering where a full user study is not feasible. For game designers, it provides structured teacher input at the point where design decisions are still open, rather than after a prototype exists. For teacher professional learning, the activity gave teachers a vocabulary for design that several indicated they had lacked, and a sense of involvement in decisions that usually reach them as finished products.

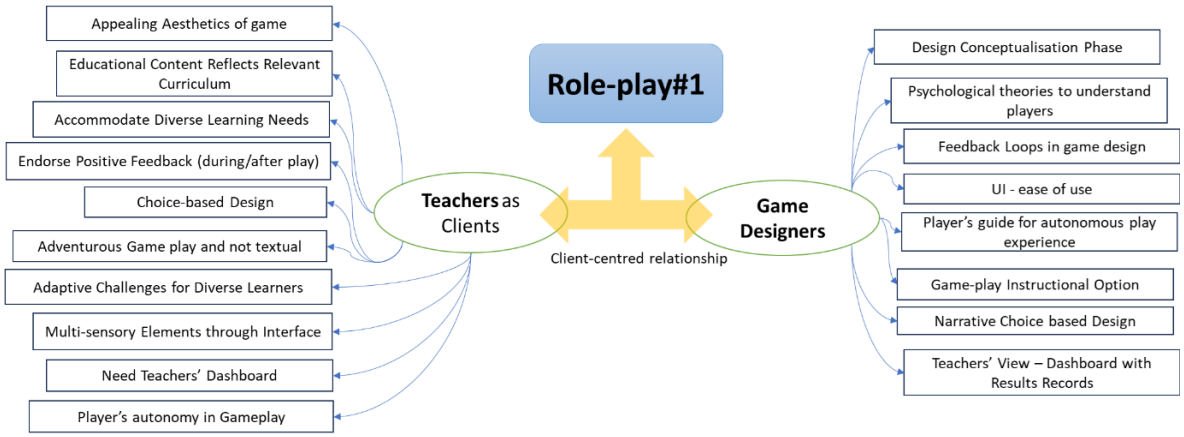


Figure 3: Role play#1 Summarised points discussed across 3 CODWs; and how client-centred relationship was observed throughout this role

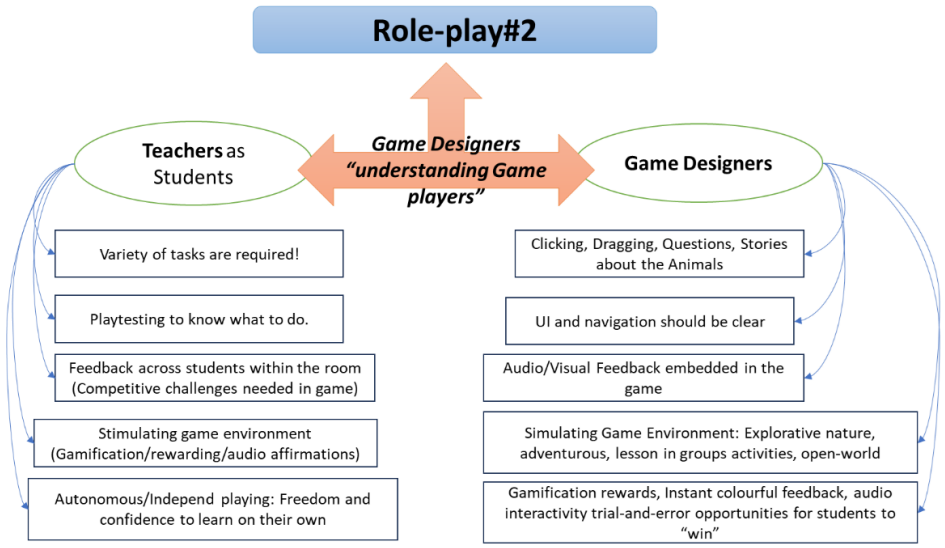


Figure 4: Role play#2 Summarised points discussed across 3 CODWs; and how game designers approached teachers as understanding them from students as players perspectives

This paper is limited to one of the six CODW stages because of length constraints, so the connective logic of the full workshop method is not visible here. The sample also bounds what can be claimed. Where similar points recurred across all three sessions, this is reported as convergence within a small purposive sample rather than as evidence of a general pattern. Whether the same role configurations behave comparably at larger group sizes — the medium and large workshop categories in the wider project — remains open. A further limitation is that the paired format produces a dyadic rather than a group dynamic; the negotiation observed in role-play three may be a feature of one-to-one exchange rather than of role reversal itself. Although open-ended role-play is difficult to represent diagrammatically, it remains a valuable technique for initiating collaboration in EG design, and it lowered the barrier between two groups who wanted direct conversation with one another. The subsequent stages of the CODW method are reported in forthcoming publications.

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