
Are we together now?

Shared agency in multi-user games

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Abstract

Educators have called for digital games that large groups of 20-30 students can play together in classrooms, university seminars and professional training courses. Using shareable technologies, such as tablets and interactive tabletops, it is possible for games to engage large groups in face-to-face collaboration and discussion. But how can game user experience be evaluated in real-world, co-located learning, where engagement is mainly driven by social phenomena, such as peer teaching and discussion? In this extended abstract we argue that large-group, face-to-face gaming calls for a view on game user experience that takes the group, rather than the individual, as the unit of analysis. We indicate some methodological issues based on our own experience with designing simulation games for large co-located groups. Our aim is to invite a discussion of how the concept of shared agency can inform methodological approaches to evaluation.

Author Keywords

Gaming; shareable technologies; classroom; multi-user

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Human Factors; Design

Introduction

This article proposes the notion of *shared accountability* in multi-user games. To elaborate on this notion we discuss specific features of the 4Decades game (CHI2012) [1].

Personal input devices and personal agency

Within mainstream computer games one can identify two classes of multi-player involvement: online gaming and co-located gaming. Whereas online gaming typically means that each player has their own screen, co-located gaming typically involves some kind of shared displays, usually a large screen. In both cases, however, each player is assigned a personal input device through which their role in the game (i.e. player 1, 2, etc.) is uniquely identified. Input devices can be, e.g., game controllers such as the *Wii Remote*, multiple mice, networked computers, separate territories on a shared interactive surface or even an individual human body, in the case of motion-sensing, e.g. with the Microsoft *Kinect*. Input devices are rarely shared between players.

This strict coupling of input devices to individual players allows the game to assess an individual player's performance and consequentially provide reward, scaffolding and other feedback on an individual basis. In this sense, co-located gaming resembles the situation in a traditional classroom, where there may be some shared displays, e.g., a blackboard or projection screen, but input from students happens mainly through personal devices, i.e., pen and paper. Names written on the papers allow teachers to give each

student individualized feedback based on the student's individual "input". In a similar way, multi-player computer games normally maintain the reference to the individual player through the player's personal input device.

With personal identification comes personal accountability. Regardless of whether a game is collaborative, cooperative [2] or competitive; a player's basic actions are bound to be of a personal nature, potentially subject to social divulgement and judgment through the game and/or other players.

Shared input devices and shared agency

While players' agency is commonly accepted as a defining property of games [3], we know less about the ways in which agency [4] can (or should) be distributed between individuals and groups (pairs, teams, etc.). Some games emphasize collaborative decision-making in groups. It is conceivable that such games might benefit from the use of shareable interfaces that have the potential to take some of the individual pressure off by spreading accountability out among a group.

In our research we have used shareable tablets (figure 1) and ambient displays (figure 2) to design large-group interfaces for team-based simulation games [1]. We found that in-game arguments and post-game reflections indicated a *shared sense of accountability* within the group. In-game decisions were made based on prior verbal negotiation and players mostly spoke of their in-game actions as "we", referring to the whole team, while using "I" only for subjective perceptions. This shared sense of agency may have been encouraged by the design of the game interfaces, as described in the next section.

Shared agency in 4Decades

4Decades is a team-based game that allows 20-30 students to explore different climate change scenarios. Each of two teams shares an ambient display (projection screen) and four tablet computers. Each tablet represents a government that can decide upon local spending. The fact that there are more players than tablets facilitates the emergence of four subgroups within each team, as players gather loosely around the tablets. The following two subsections describe how accountability was shared *within* and *between* these subgroups.

Shared agency around the tablets

Figure 3 shows how the tablets were used together by pairs. Players tended to keep their hands off, but close to, the interactive touch screen, in order to allow either player to access the interface at any moment. Buttons were pressed either after joint discussion or while 'thinking aloud', as if to double-check with teammates, while different spending options were explored. Since actions in the game were limited to increasing and decreasing numbers via PLUS and MINUS buttons, while observing a local forecast, all in-game decisions were easily reversible until the end of a game round (one minute). Thus, pressing a button did not mean committing to a decision, but rather tentatively suggesting an idea to the (sub)group or merely peeking into a possibility. By watching the forecast change, neighboring players could easily intervene if they disagreed with a strategy. It was therefore not important who actually pressed the buttons. What counted in each game round was the agreed final set of numbers.

Shared agency within teams

After each round, data about the decisions and outcomes created on the tablets were 'posted' on the ambient displays, together with a summary for the whole team. This allowed subgroups to reflect on their decisions in comparison with the rest of the team. Each subgroup could easily identify which data items on the ambient displays referred to their tablet, by recognizing the entered values. However, since the tablets were not labeled, it was not immediately apparent which of the *other* subgroups was accountable for a particular data item. In situations where the ambient displays revealed a 'mistake' or other deviation from an agreed team-wide strategy, teams usually did not bother making the effort to investigate which subgroup to point the finger at. Instead, complaints about disunity were addressed to the whole team, calling for closer collaboration in the future. "Are we together now" was asked, rather than "who did it". One could conjecture that subgroups had less social pressure to fear by being to some extent quasi-anonymous.

Moreover, as players occasionally moved around between subgroups and negotiations occurred across subgroups, it was at times ambiguous which subgroup individual players belonged to. This property of subgroups, of being ephemeral, could be seen as another driver for shared accountability within a team.



Figure 1: Several players sharing an iPad



Figure 2: One team at a table, sharing an ambient display



Figure 3: Pairs making decisions in a consensual way

Methodological Implications

To evaluate and improve the design of 4Decades we have used video observation, transcripts of group discussions and individual questionnaires. It is clear that some aspects of user experience can be accounted for on an individual level, whereas others need to be seen in the context of group interaction and group cognition [5]. For example, individuals can be asked whether they found the text on the ambient displays easy to read from a distance. We can also ask individuals whether they enjoyed a session or found the discussions useful from a personal learning perspective. However, it may be more problematic to ask users about their sense-making experience, e.g., how easily they could make sense of the tablet interface or the mathematical model underlying the simulation. Considering the high levels of shared meaning-making observed around these aspects, it seems a fair question to ask – when we say user experience, do we mean an individual user or a group that is thinking together?

References

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