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# Tuvatar: An Avatar-Mediated Small Group Learning Environment

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**Abstract:** Using the metaphor of the theatre, Goffman describes people as actors who perform roles according to the social situations. From this perspective, our behaviours and reactions are influenced by how we think others perceive us and how we want to be perceived by others. As collaborative learning is a social interaction, this research uses Goffman's perspective to develop a framework and design a novel learning platform with the aim of understanding and facilitating collaborative learning.

## Introduction and the SARA framework

Collaborative learning is considered to be an effective educational approach (Laal & Ghodsi, 2012), but its effectiveness can be hampered when students are not meaningfully engaged in group activities. For example, Bowen and colleagues (2012) observed the issue that students were reluctant to express honest opinions or tended to give non-critical (friendly but unconstructive) comments to their peers. Without exchanging genuine thoughts and ideas with group members, students are not having meaningful peer interaction and collaborative learning cannot take place. Since collaborative learning is a social interaction, this research aims to understand and address this issue through the lens of social psychological theories.

Goffman (1959) views social interactions as theatrical performances and suggests that we need to keep our audiences separated from each other, otherwise a "staging" problem will appear when we handle different audiences at the same time. It is true that most people behave differently in front of different audiences such as their parents, friends, romantic partner, children, colleagues, and strangers. For the same reason, students may have difficulty deciding who they should be (e.g., a friend, a learner, or a peer reviewer to evaluate other students' work) during group learning activities. Therefore, from Goffman's dramaturgical perspective, non-meaningful peer interaction is caused by the staging problem. Since Goffman's work has been used to understand people's behaviours online (e.g., Bullingham & Vasconcelos, 2013), this research applies his metaphor of the theatre to online learning environments and develops a framework called SARA (Stage, Audience, Role, Appearance). This work summarises the essential elements and show how they can guide the design of peer learning platforms.

## Designing a novel collaborative learning environment

To address the staging problem in peer interaction, the online learning environment should keep different Audiences in different Stages (the first two elements in the SARA framework). Superficially, anonymity in online environments can be a solution – when students do not have to reveal their real-life identity, they can ask any questions or give critical peer comments to their classmates without the fear of looking stupid or unfriendly. However, anonymous interaction could result in insults or create an unproductive group atmosphere (Christopherson, 2007). From the dramaturgical perspective, a proper appearance is the factor that contributes to the success of the role performance. Therefore, the online learning environment should give students an Appearance that could tell them their Role (the last two elements in the SARA framework) and guide them to play out their role (e.g., a learner or collaborator) during small group learning activities.

In online environments, avatars (graphical representations of users) are one's appearance which directly provides identities and attitudes of the person-in-communication. Research studies on avatar-mediated communication (e.g., Yee et al., 2011; Yee & Bailenson, 2007) found that avatar users conformed to behaviours that match the identity or characteristic of their avatar. Furthermore, Oh and colleagues (2016) found that an avatar's facial expressions (e.g., smiling) affected its user's communication experience. Moreover, since the online environment is shown to each user separately through his/her computer screen, the same avatar can be rendered differently among users to match their perceptions of a specific role or situation. Therefore, using avatars with specifically designed role or identity cues and characteristics (e.g., suitable outfits together with positive traits and facial expressions) may induce positive peer interactions within small group learning contexts.

## Tuvatar: An avatar-mediated learning platform

Tuvatar (tuvatar.com) is developed to demonstrate the feasibility of implementing the SARA framework and to explore the potential of student-customised avatars with appearance rendering. On Tuvatar, teachers can set up different virtual spaces (Stage) such as a teamwork space or a peer tutoring space to organise group activities. Teachers can also assign different roles (Role) such as the role of collaborator or the role of tutor to students. Students' real-life identity is unknown to their group members (Audience) so they will not be distracted by their

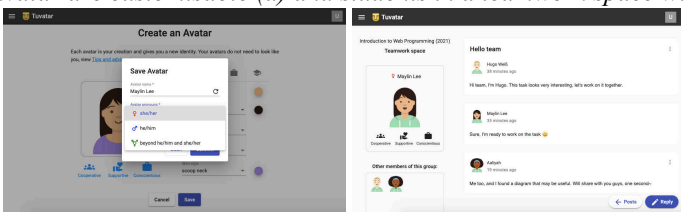
 

real-life social relations, and they will be prompted to select or create an avatar (Appearance) before participating in group activities. On Tuvatar, students can create avatars that have a name, gender, physical appearance, and personality different from their own (see Figure 1a). In addition, students can create and maintain multiple avatars in a single account, so that they can tailor their identity and appearance by using an appropriate avatar to work as a team in a teamwork space, or to play the role of tutor/tutee in a peer tutoring space.

To give students a proper appearance to perform their role within small group learning contexts, their avatars would be shown wearing an outfit that fits their role or the situation. For example, students in a teamwork space would see their avatars wearing their self-customised team uniform, and since the avatar appearance is shown to each student separately, each student would see all other team members' avatars wearing the exact same uniform of his/her choice (see Figure 1b) while the fact is each member may have designed a different uniform. By that means, group members' clothing could be unified to create a team atmosphere while individual preference and perception are retained. In addition, to convey behaviour expectations to students, their avatars always have positive (such as friendly and enthusiastic) facial expressions, and only positive personality traits related to learning and collaboration (such as inquisitive and cooperative) are available for students to choose from.

**Figure 1**

*Avatars on Tuvatar are customisable (a) and students in a teamwork space with the same uniform (b)*




(a) (b)

## Discussion and outlook

The development of Tuvatar demonstrates how the SARA framework can be implemented in the design of an online collaborative learning environment. At present, Tuvatar can be used by researchers to understand students' perceptions of a particular role (e.g., tutor) or situation (e.g., learning STEM subjects). By analysing the student-customised avatars (e.g., avatars' gender, race, and personality traits), students' perceptions and stereotypes can be identified. For example, it is possible to examine if students tend to create and use male avatars to be the tutor in a math tutoring session. Tuvatar is an ongoing project and one of the future directions is to enrich the group identity cues by further unifying (or diversifying) group members' avatar appearance (e.g., hair and skin colour), so surface-level diversity (e.g., based on race) in groups could be customised for research or learning purposes.

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