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## **Architecture students' appropriation of avatars – relationships between avatar identity and L2 verbal participation and interaction**

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### **1 Introduction**

The synthetic (virtual) world Second Life can be defined as a social networking environment for it allows users to network informally by initiating relationships with other users, often strangers with whom they share no previous offline connection. Users can also connect with other users with whom they have previously established offline relationships. In the synthetic world, networking can occur by interacting, and later *friending*, other users whose avatars are proxemically close to a user inworld. This is facilitated by the feature of the synthetic world which allows any interaction between users in the public audio or textchat channels to be heard / read by other nearby users. Users can also initiate relationships through similar interest groups and choose to create a public profile, albeit relating this profile to that of their avatar or their physical world (first world) identity. Users who *friend* each other can view the newsfeed and interest groups as well as the list of connections of one another, and can navigate the latter.

The development of social networking environments allows users to construct online personae / identities which may differ from their first world identities (Turkle, 2011). The environments offer new ways of communicating both verbally and nonverbally which imply new ways of being, of showing and negotiating identities (Nagy, 2010). As fully anonymous social networking environments, synthetic worlds offer specific possibilities for identity construction and new ways of interacting because users are represented in the environment by an avatar through which they communicate. In the language-learning (L2) domain, interest is emerging in this type of environment. Research suggests that synthetic worlds may reduce student apprehension concerning interacting in a second language (Schweinhorst, 2002) and increase the students' sense of presence and community (Nowak and Biocca, 2004). However, the questions of whether and how language learners use avatars to develop an identity, the impact of avatar use on participation and interaction in a L2 remain largely unexplored.

In this chapter, we explore the above questions through the data analysis from an experiment designed around a course in *Second Life* which formed part of the European project ARCHI21<sup>1</sup>. For this course, a Content and Language Integrated Learning (CLIL) approach was chosen for students of Architecture whose foreign languages (L2) were French (FFL) or English (EFL). We explore how these students developed their online identities and how these identities were forged through avatar appearance and the use of nonverbal acts, including gestures. We examine how these identities impacted interaction. Firstly, how changing avatar appearance influenced how students addressed each other inworld and their level of verbal participation in L2 interaction. Secondly, whether constructing an identity partially through nonverbal communication acts in this social networking environment may have created opportunities for

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<sup>1</sup> The course formed an action with the European project 'Architectural and Design based Education and Practice through Content and Language Integrated Learning using Immersive Virtual Environments for 21st Century Skills', Lifelong Learning Programme, KA2 Languages. The project was funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

increased L2 verbal participation. In our study, no instructions were given to the students regarding avatar appearance. The research questions presented here were formulated after remarking upon how students changed their avatar appearance and used nonverbal communication during the course. Our study focuses on the L2 interaction during open-ended activities rather than question-answer exchanges which may be more typical of a non-CLIL learning context.

## 2 Identity overview

Identity plays an important role in self-concept (Zhao, Grasmuck and Martin, 2008): an individual's perception and beliefs of him/herself in relation to a number of characteristics. A simplified definition of identity is that it is the part of self by which a person is known and recognised by others. Identity construction is a public process which combines both how an individual claims his/her identity ('identity placement') and how other people approve, or not, this claimed identity ('identity announcement'). Identity is also considered as fluid in that it is constructed with and through other people and will change depending upon the community or group with whom an individual is interacting and the collective identity of the community or group. Social identity theory suggests a person's conceptualisation of self is formed of multiple parts (or identities) depending not only on the social groups with which the person interacts (Hogg, Terry and White, 1995) but also those that a person aspires to join (Cabiria, 2008). Nagy states

*in the usual face-to-face interactions, identity is constructed under a unique set of constraints. The presence of the corporal body in social encounters prevent people from claiming identities that are inconsistent with the visible part of their physical characteristics (e.g., sex, race, and looks), and the shared knowledge of each other's social background and personality attributes renders it difficult for an individual to pretend to be what he or she is not. (2010, p.171)*

Thus, identity construction occurs through changing physical environments, appearance and language and through interactions with others. In face-to-face contexts in which strangers meet, whilst a person's identity placement may differ in the information they communicate about his/her social background and personality attributes, 'identity claims still cannot go beyond the limits set by embodiment' (Nagy, 2010, p.171). One of the characteristics of online social networking environments, however, is that they allow new forms of social interaction by changing the former conditions of identity construction (Zhao, Grasmuck and Martin, 2008) because physical and personal characteristics are not directly obvious to others. Social networking environments also offer possibilities to enter into new communities where personal information is not necessarily directly shown to community members, thus, offering the possibility of experiencing a different self and of constructing new identities.

In social networking environments, users' online identities are created both through nonverbal and verbal identity claims, for example, the display of visual photographs (nonverbal) or how users choose to portray their identity through the language used in their profile descriptions, wall posts and comments (verbal). Many social networking environments, such as *Facebook* and *academia.edu*, rely primarily on 'anchored' and 'anonymous'<sup>2</sup> relationships (Zhao, Grasmuck and Martin, 2008). Frequently, these relationships have been previously established offline. The level of anchorage will vary depending on the extent to which a person's online profile can be identified and located offline. For example, through their legal name, location of residence or an affiliation with a physically-located institution. Given that the networked aspect of these environments spans both online and offline networks, constraints are placed on the degree of freedom with which users can construct their online personae and communicate their online identity nonverbally and verbally.

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<sup>2</sup> The opposite of 'anonymous'.

By way of contrast, in a fully anonymous social networking environment, networking may be facilitated because users are free to construct the identity(ies) they wish and can decide whether or not to share information about their physical identity. In synthetic worlds this is particularly true because interactions are free of physical constraints due to users being represented by avatars: semi-autonomous agents represented in a digital space which can perform actions when commanded by the user (Peachey, Gillen, Livingston and Smith-Robbins, 2010). With no physical manifestations of a person's appearance or body to communicate information about users' physical identities, the possibilities for users to construct online personae that differ from their physical life identities are multiple.

*These environments [synthetic worlds] enable interaction between people to be conducted entirely online, the absence of direct visual [...] contact and the flexibility the technology provides for creating digital representation enables users to adopt new identities without physical constraints (Childs, 2011, p.18).*

In the domains of social psychology, digital media, and educational technology there is an increased interest in the impact of avatar identity (see Peachey & Childs, 2011) and, in particular, avatar appearance on interaction via avatars. Several studies have shown that whilst synthetic world users exert an influence over their inworld personae and digital embodiment as an avatar, the appearance and inworld personae of their avatars also influence the users in terms of their behaviour (Pěna, Hancock and Merola, 2009) and interaction (Yee and Bailenson, 2007).

In a situated approach to inworld learning, the role of avatars and their identity is significant. Childs (2011), describing the importance of avatar appearance for learners, suggests that developing a body image and identity for a learner's avatar is an 'essential precursor for any subject-based activity' (2011, p.27) because in any inworld learning situation the avatar is both the tool through which a learning situation will take place and the learners' 'social capital' (Bourdieu, 1986) within the group. In language learning, an avatar is the tool through which learning occurs. This takes on further importance because situated approaches will rely on the co-creation of knowledge through learning situations which involve discussion and collaboration in the L2. In such situations, the communication of the avatar is the object of learning as well as the tool through which the language learning takes place. Given that the avatar can be perceived as the source of a message in interaction, recognising how language learners perceive them and use them has important implications for understanding learning in these environments.

In non-computer-mediated communication contexts, nonverbal acts, including those of appearance and gestures, play important roles in communication (Kendon, 1982). Research suggests nonverbal and verbal acts of communication are part of a single system with the same underlying mental processes (McNeill, 2000) and there is an increasing interest in the role such acts play in second language acquisition (see McCafferty and Stam, 2008). With regards to L2 learning, it is assumed that communicating through avatars provides numerous potential opportunities for distance language learners; the physical presence of avatars providing verbal, para-verbal and nonverbal communication possibilities (Peterson, 2010; Wigham and Chanier, in press).

The use of avatars and their communication as the object of learning as well as the tool in language learning situations raises certain questions. As outlined by Lamy and Hampel (2007) these include i) whether and how learners use avatars to develop an identity; ii) what avatar embodiment means for interaction; and iii) the extent to which the character of an avatar influences interactions. In this contribution, we address how learners distinguished between first world and inworld identities and how students constructed inworld identities through avatar appearance and the use of nonverbal communication acts. We relate changes in avatar appearance and use of nonverbal communication to students' L2 verbal interaction and participation.

## 3 Context for study

### 3.1 Social networking context

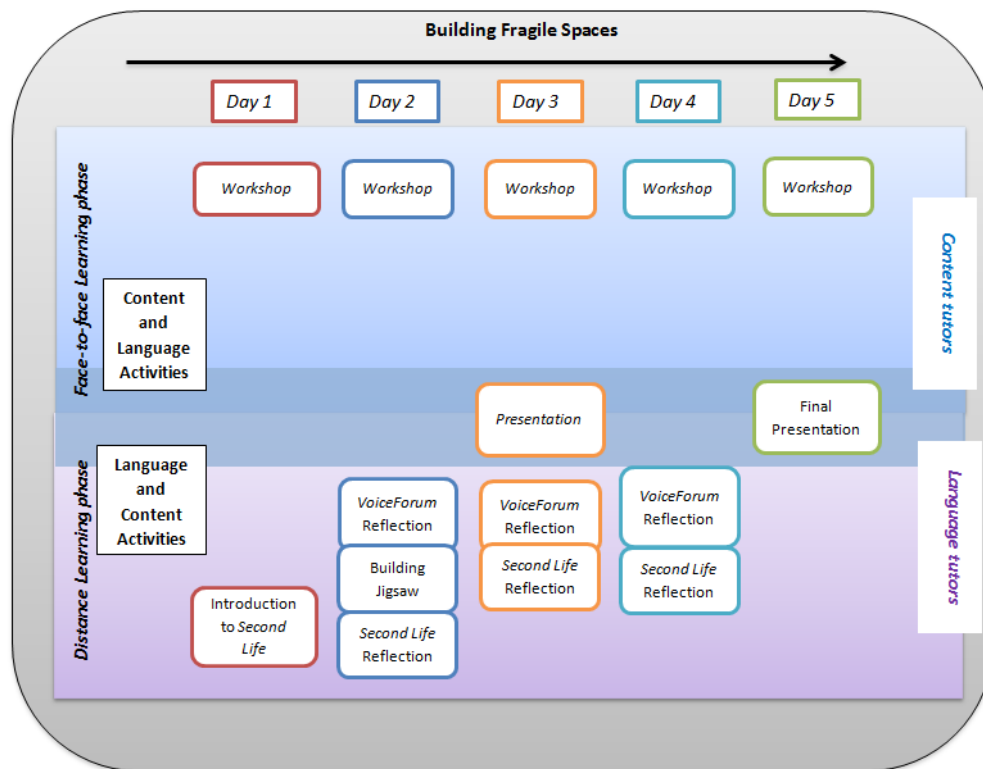
Social networking contributed to the context for the intensive design workshop '*Building Fragile Spaces*' studied in this contribution at two different levels. With respect to Muijs, West and Ainscow's definition of networking as 'at least two organisations working together for a common purpose' (2010:6), the CLIL approach, at the heart of the course studied, brought together architecture teachers from the *Ecole Nationale Supérieure d'Architecture Paris-Malaquais* in Paris and language teachers from *Université Blaise Pascal* in Clermont-Ferrand to explore the potentialities of the synthetic world *Second Life* for a teaching approach where the teaching /learning processes of the content and language are interwoven. The five-day design workshop, held in February 2011, was a pilot study in the European project ARCHI21. The relationship initiation for some of the language and architecture teachers involved in this project occurred in *Second Life*. Thanks to the networking possibilities offered by the synthetic world, inworld groups allowed the teachers from different academic fields to be introduced, *friend* each other and then, through these new connections, to discuss the potential for a project which developed into ARCHI21.

### 3.2 CLIL approach

In the CLIL approach, 'an additional language is used for the learning and teaching of both content *and* language' (Coyle, Hood and Marsh, 2010, p.1) and the teaching and learning processes of the content, here architecture, and the additional language (L2), here French and English, are interwoven. Our approach was content-driven with the emphasis on the architectural content. The learning design for the language activities was articulated around the architectural learning design (see Figure 1). The overall course objective was for students to create within four small workgroups, using their L2, a working, conceptual or architectural model in *Second Life*. The model had to respond to a design brief pertaining to either the theme of *Avatars*, *(E)spaces*, *Scenario* or *Land+scapes*. At the end of the course, the students had to present their model orally in their L2 before a public jury.

The trigger for the macro task was a conviction that 3D synthetic worlds are exciting new design fields for architectural experimentation. The community-building possibilities and the participant-created nature of the synthetic world *Second Life* were particularly important in choosing this specific synthetic world as one of the learning environments. Firstly, the open, bottom-up nature and user-oriented features of the social networking environment which allow users to develop and create the content of the synthetic world were of great importance, in order to allow the architecture student groups to create models within the world and to be able to share their project work with other groups throughout the course. Secondly, the heightened social networking opportunities with other users were believed, by the architecture teachers of the course, to be greater than in other synthetic worlds. In particular, because the synthetic world allows users to see the profiles of other avatars that are proxemically close and, thus, to locate interact with other users, outside of their network, who are in the same inworld location. This was important to encourage the different workgroups to publically share their models during the development process with other workgroups and other *Second Life* users external to the course. This allowed the workgroups to receive comments and feedback on their project from other *Second Life* users: the networking effect helping their models to become more valuable as the number of people viewing them inworld increased (see Zourou, 2012).

In *Second Life*, the teachers did not define for workgroups how the interaction and collaboration between them should occur or which tools they should use. Rather, following an introductory session to the communication tools in *Second Life* and an introductory session to building inworld in the L2, the students were free to network and interact within their workgroups as they wished and had to manage the advancement of their model themselves.



**Figure 1: Learning design of the *Building Fragile Spaces* course (from Rodrigues, Wigham, Foucher & Chanier, in press)**

### 3.3 Reflective sessions

To assist the students in their interaction and collaboration, the language tutors ran *Second Life* reflective sessions, studied in this contribution, with the workgroups on days two, three and four of the course (see Figure 1). Although the L2 was used by students to interact during these sessions, the primary objective was not linguistic but for the students to articulate and deepen their understanding of their workgroup's design workshop process by externalizing their understandings. A second objective was for the students to develop critical thinking, aiding them to distinguish, within the specific context, the pertinent information in terms of the group's overall problem identification (Chanier & Cartier, 2006). The reflective sessions provided opportunities to 'stand back' from the architectural macro task to give students better understanding of the ideas explored with their architecture teachers and with their workgroup or individually inworld. This process was encouraged by asking the students to recall and describe in their L2 the information given to them by architecture teachers and any inworld observations made. The students were asked to infer the relevance of this knowledge and identify possible paths of future enquiry or direction for the development of their project work.

Students were asked to bring to each session images of their inworld exploration or their inworld work and notes taken during the day about their feelings concerning their workgroups' progress on the macro task and their individual contributions to this. Figure 2 shows an example of the typical *Second Life* environment configuration for the group reflective sessions. Each session was programmed for 45 minutes and was divided into three distinctive micro tasks concerning the students' general impressions of the day, their group achievements and the reformulation of the remarks made by their architecture teacher during the feedback session. The micro tasks for the session are projected on one posterboard and a student's image of his/her work on another. The nature of the reflective sessions was, thus, of an open verbal discussion / task in which the tutors' role was to animate the discussion and help the group

advance in their response to the problem brief, despite the domain of architecture not being an area of expertise for the language tutors and them, therefore, not necessarily mastering the contents of the task.



**Figure 2: *Second Life* environment configuration for the group reflective sessions**

### 3.4 Course environments and participants

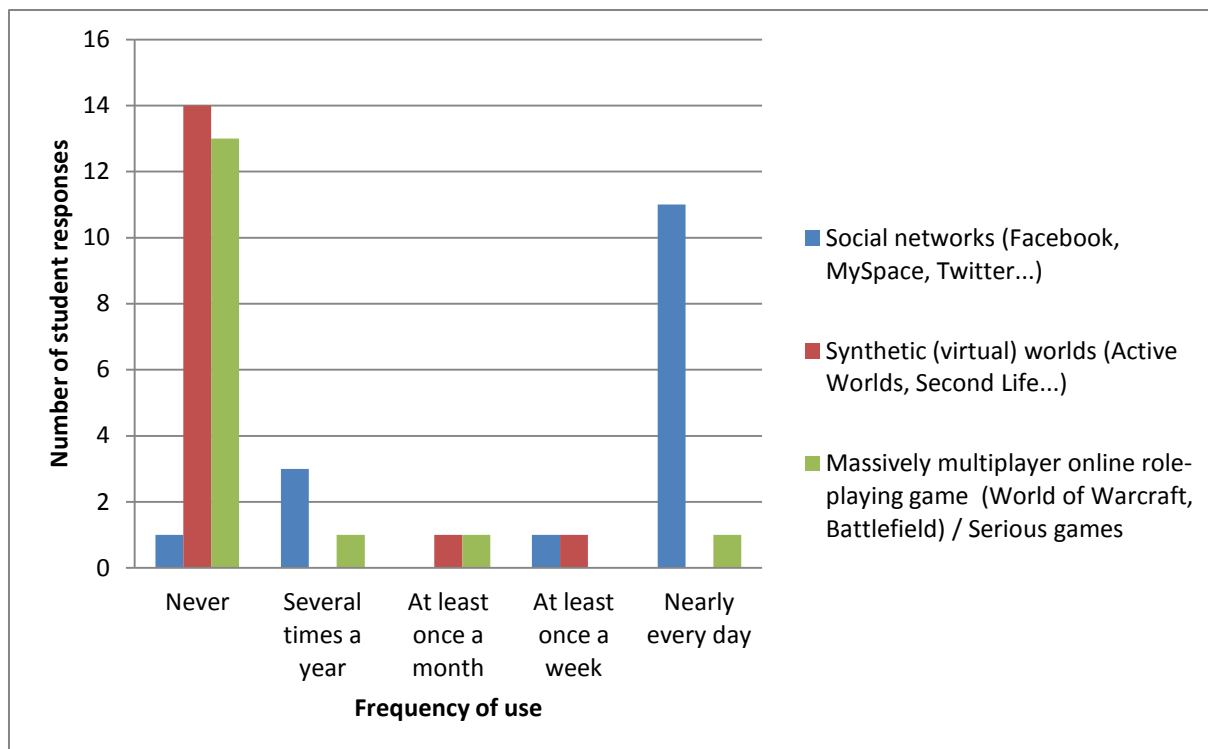
*Building Fragile Spaces* was a blended course involving a face-to-face classroom learning environment and the online learning environments of *Second Life* and the software platform for spoken interaction *VoiceForum* (Fynn, 2007).

Two architecture teachers (one native French speaker and one native English speaker) worked face-to-face with the students during the course. In the face-to-face workshop sessions, students explored *Second Life* with reference to their problem brief and created their model inworld. An EFL teacher and a FFL teacher from *Université Blaise Pascal* accompanied students from a distance (see Figure 1) during the language sessions in the online environments *VoiceForum* and *Second Life*. For the *Second Life* sessions, the students connected individually and synchronously to the synthetic world.

Eight female and nine male students, ranging in age from 21 years old to 25 years old, participated in the course. They ranged from first year undergraduates to second year Masters' students. French was the mother tongue of nine of the seventeen students. The French students' L2 was English. The mother tongues of the remaining eight students were Spanish, Chinese, Italian, Korean and Arabic and their L2 was French.

Before the course, students were instructed by email to sign up for *Second Life*, to select an avatar to use during the course from the pre-customised selection the synthetic world offers and to *friend* their language teacher. No instructions prior to the course were given concerning avatar appearance. Although students chose a name for their avatar when entering *Second Life* for the first time, the students were asked to use their first name with the suffix 'rez' as the display name for their avatar that would be shown to other users. For example, a student named David would have been asked to name his avatar *Davidrez*. This was to aid the research protocol designed around the course, specifically the data collection. Once the course was finished, the students could change the display name of their avatar. In this study we refer to all participants by their avatar names.

Only two of the sixteen students had previously used the synthetic world *Second Life*. Fifteen of the 17 students had used other social networking environments (see Figure 3). No students had previous experience of a CLIL approach.



**Figure 3: Students' previous use and frequency of this use of online multiuser environments**

The participants were divided into four workgroups. This division was thematic and linguistic: each workgroup received a different architectural problem and worked in the target L2 of either French or English. Two workgroups, studying the themes of '*(E)spaces*' and '*Scenarios*' (respectively groups GE and GS) in *Second Life* had English as their L2. The groups studying the themes of '*Avatars*' (GA) and '*Land+scapes*' (GL) had French as their L2. The language levels of the EFL students ranged from the CEFR (Council of Europe, 2003) levels B1 to B2 and for the FFL students from A2-B1.

#### 4 Data collection and structuring for analysis

Researchers present in *Second Life* observed all of the group reflective sessions and recorded screen and audio output using video screen recording software. The influence of a researcher's presence on participants' inworld behaviour is termed by Panichi & Deutschmann (2012: 225) as the 'observer avatar paradox': the task of gathering data is undermined by the researcher's presence itself (Labov, 1962). Therefore, a small animal avatar was used by the researchers inworld. Considering the study by Yee and Bailenson (2007), which suggests that the height of an avatar influences users' behaviour, the researchers chose a small avatar that was an animal figure to dissuade participants from addressing them in their interactions. It was, thus, hoped that the researcher's avatar would be as unobtrusive as possible. However, we cannot ignore that the researchers' presence may have impacted participants' identities and their construction during the research process.

Textchat logs from each reflective session were saved. Pre- and post-course questionnaires were administered using an online survey tool and semi-directive interviews using an audio-graphic conferencing environment were conducted with five students following the course. From the screen and audio recordings and textchat logs, multimodal transcriptions of the participants' interactions during the sessions were completed, adhering to a predefined methodology (Wigham and Chanier, in press). This methodology built upon previous research (Ciekanski and Chanier, 2008) to establish a classification of verbal and nonverbal communication acts in *Second Life*. An overview is given in Table 1. The multimodal transcriptions of the interactions during the group reflective sessions allowed us to quantify students' verbal (L2) and nonverbal participation. The learning design, research protocol and data from the



multimodal interactions between course participants were structured into an open-access *LEarning and TEaching Corpus* LETEC (Chanier and Wigham, 2011).

Communication mode	Communication modality	Act type and transcription code	Explanation
verbal	audio	audio act (tpa)	verbal turn in the public audio channel
		silence (sil)	interval between two audio acts greater than three seconds
	textchat	textchat act (tpc)	message entered in the textchat window
nonverbal	proxemics	movement (mvt)	avatar movement in the environment, e.g. avatar sits down, flies, walks backwards
		entrance into /exit from environment (es)	avatar enters or exits the synthetic world
	kinesics	kinesic (kin)	avatar gestures and movements made by an avatar's body part e.g. nod, point, clap
	production	production (prod)	production or display of an object in the <i>Second Life</i> environment

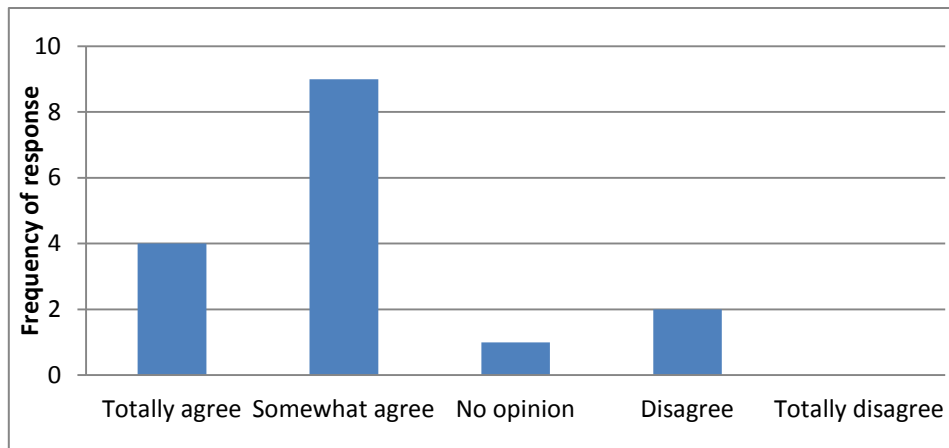
**Table 1: Classification of communication acts in *Second Life***

## 5 Avatar identity and L2 verbal participation - interaction

We now analyse whether students constructed inworld identities through avatar appearance (Section 5) and use of nonverbal communication acts (Section 6) and whether relationships exist between avatar identity and L2 verbal participation and interaction. Firstly, we examine students' perceptions of the importance of the avatar. We then consider whether learners distinguished between first world and inworld identities and constructed inworld identities through avatar appearance. We relate these results to students' L2 verbal interaction and participation. In Section 6, we investigate whether nonverbal communication acts contributed to inworld identity construction and if use of these impacted students' level of L2 verbal participation.

### 5.1 Students' perceptions of the importance of the avatar

Student questionnaire and post-course interview data suggest the importance placed on avatars for L2 communication and as social capital (Ellison *et al.*, 2010): the expected collective benefits from the cooperation between the participants, achieved through being able to communicate through their avatars. Once students could manipulate the environment to move their avatar, perform gestures and change their avatar's appearance, they believed that their avatar allowed them to engage more in L2 interaction (see Figure 4.)



**Figure 4: In distance learning situations, being able to communicate through an avatar (movements, gestures, appearance) allows you to engage more in L2 interaction with other *Second Life* users**

In the post-course interviews, from which quotes are shown as originally formulated, one student explained that L2 communication was facilitated by using an avatar because she was less afraid of making mistakes when interacting with others (see example 1). The student describes how her avatar allowed her to connect with other individuals inworld, albeit other student participants or strangers with whom she established an inworld relationship. Her avatar helped her to create opportunities to interact with members outside her network because it helped her to feel more at ease about speaking in her foreign language. Her inworld identity, portrayed through her avatar may, thus, have increased opportunities for 'bridging' social capital outcomes (Ellison *et al.*, 2010).

[Zeinarez, (FFL) 10:30-11:20]: *si on se trompe ce n'est pas tout à fait un problème parce qu'on n'est pas là dans un sens physique le problème de parler un autre langage c'est le peur de se tromper ...il faut pas dire des bêtises en français ... quand c'est l'avatar c'est pas tout à fait un problème*

If we make a mistake it's not really a problem because we're not there physically. The problem with speaking another language is the fear of making mistakes...you mustn't say anything silly in French...when it is the avatar it's not really a problem

The students also expressed not being comfortable with their avatar identity being similar to that of another user of the networking environment:

[Hyungyoonrez, (FFL) 23:01-24:42]: *c'était la même chose que Zeinarez et mon avatar c'était vraiment similaire...j'ai pas vraiment changé beaucoup de choses...c'est juste donner un peu de différence entre les autres*

it was the same thing as Zeinarez and my avatar it was really similar...I didn't really change a lot of things...it is just to show a difference from the others

[Audreyrez, (EFL) 20:26-20:41]: *j'ai changé non seulement les vêtements et puis l'apparence physique non le but était de faire quelque chose d'assez de loufoque et d'amusant le plus différent possible de soi et des autres*

I changed not only the clothes and then the physical appearance the aim was to create something which was kind of crazy and fun as different as possible to me and the others

Such statements suggest that in the students' subjective perception of the conceptualisation of their avatars, social capital was highly important and demanded individual inworld identities. One reason for this may be that students did not wish to appear as 'newbie' users, in order to network and integrate more quickly with more experienced/knowledgeable users. The students' perceptions of their avatars as social capital may also be related to *Second Life* being the students' object of study as well as the environment in

which they were studying: their avatars influenced how the students reflected upon their projects and the image of themselves reflected, in part, the architectural stance they wished to adopt in the synthetic world *vis-à-vis* their workgroup and other users of the social networking environment. As one student explained, her avatar was the object which represented her thoughts and character:

[Hyungyoonrez (FFL) 23:55-24:52]: *l'avatar est une chose pour représenter notre notre pensée et notre esprit comme ça du coup l'apparence est une première chose de montrer comment je pense*  
the avatar is the thing which represents our thoughts and our spirit therefore the appearance is the first thing to show how I think

To link the above student impressions to our research study, we now examine whether students made distinctions between their first world and inworld identities, how their inworld identities were constructed by changes in avatar appearance and any impact of this on L2 verbal interaction.

## 5.2 First world –inworld communication and identity distinctions

Our interview data (see example 5) suggests students distinguished between first world and inworld interaction during the course.

[Zeinarez (FFL) 23:55-24:52] *avec la personne avec qui j'ai travaillé même si on était juste à côté des fois on se communiquait avec des avatars...quand par exemple quand elle voulait me montrer quelque chose dans l'île elle me regarde pas elle me parle pas mais je trouve une invitation de téléportation alors ok je vais elle est juste à côté de moi mais c'était marrant d'aller voir son avatar qu'est-ce qu'il veut*

With my partner even if we were just beside each other [in the face-to-face environment] sometimes we communicated with each other using our avatar...for example, when she wanted to show me something on the island she wouldn't look at me or talk to me but I would find a teleportation request so I would teleport she was just beside me but it was funny to go and see her avatar and what it wanted

This differentiation between inworld and first world communication may have been due to students making a distinction between first world and inworld personalities. To examine this, we coded and counted in our transcriptions of the reflective sessions how the students referred to one another in their interaction. Although the students had been asked to name their avatars in a particular manner, six of the seventeen students did not follow this instruction but rather invented avatar names. Four of these students (students S1-S4, Figure 5a) were referred to, by their classmates, using their first world name (see Figure 6). For example, the participant *Prevally* (student S3) was referred to eight times by her first name and not at all by her avatar name. In comparison, the avatars of two participants, *Hallorann* (student S5) and *Tingrabu* (student S6), (see Figure 5b) were addressed by their avatar names rather than the students' first world names. For example, *Tingrabu* was addressed by his avatar name six times and never by his first name.

Our data revealed that avatars with a human-based morphology were referred to in the interaction by their users' first names. However, avatars referred to by their avatar names had a less human-based morphology (Figure 6). It appears that that the choice of a less-corporeal body by students for their avatar helps distinguish the inworld identity placement of these students from their first world identity.



Figure 5: Avatars with human-like morphology

Avatars with changed morphology

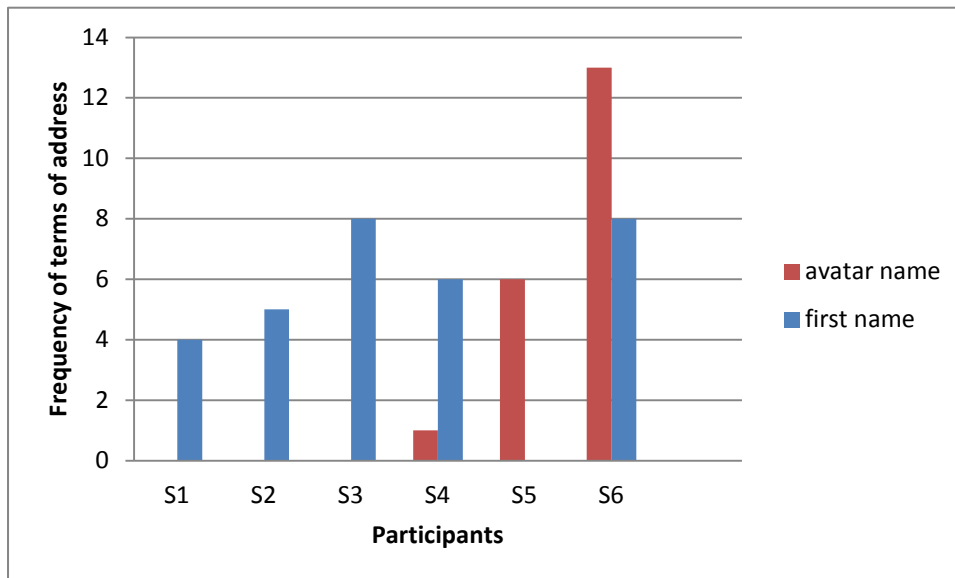


Figure 6: Terms of address for students whose avatar names did not correspond to their first name (see Figure 5)

### 5.3 Avatars' morphological evolution related to L2 verbal participation and interaction

To better understand changes the students made to avatar morphology and, in particular, whether this impacted L2 verbal participation and / or interaction, we examined our student avatars' morphological evolution with respect to the number of L2 verbal acts during the reflective sessions which have been transcribed. Although in the 'Introduction to *Second Life*' session, no activities had involved changing the avatar's clothes or appearance nor any specific instructions given in the pre-course email, we noticed that despite *Second Life* being a new environment for most students, as they evolved in the world which they were constructing as part of their architectural design projects many students customized their avatar's appearance.



**Figure 7: Female student participant *Emmegi88* changes her avatar body shape between day one and three of course**

The changes students made were, frequently, to become less based on human morphology either by using editing avatar appearance using the *Second Life* menu to customise an avatar's look (e.g. change skin colour, body shape, see Figure 9) or by adding objects which were scripted to their avatar's body. In *Second Life*, it is possible to use the computer programming language *Linden Scripting Language* to write programs which produce scripts (sets of instructions) to give behaviours to *Second Life* objects which can then be worn by avatars. For example, a script can be written so that the hat worn by an avatar includes moving appearance components (see Figure 8, left) or that an object (e.g. a can/mug) carried by an avatar makes the avatar repeatedly performs a gesture at determined time intervals (e.g. that of drinking, see Figure 8, right).



**Figure 8: Avatars with a scripted appearance – a light rotating around an avatar's head – and an avatar carrying an object which scripts the kinesic act of drinking**

Twelve of the 17 students customized the appearance of their avatar during the course. These changes were predominantly made after the first introductory session to *Second Life* or midway through the course. Figure 9 illustrates this. The figure's organization is inspired by Warburton's (2009) graphical illustration of the development of avatar identity and empathy in Multi-User Virtual Environments (MUEs) based on his study of common threads in narratives describing the evolution of avatars. His graphical illustration shows the links between time spent inworld and a user's empathy with his /her avatar. In our graph, a vertical increase of one in the *y* axis showing a modification to avatar appearance by a student from one session to another. For example, the student *Arnaudrez* modified his avatar's appearance between each of the first four sessions, but then did not change appearance between session four and five (shown by the horizontal line). *Audreyrez*, did not change the appearance of her avatar

between sessions one and two and sessions three and four (horizontal lines), although the student changed her appearance between sessions two and three and sessions three and four.

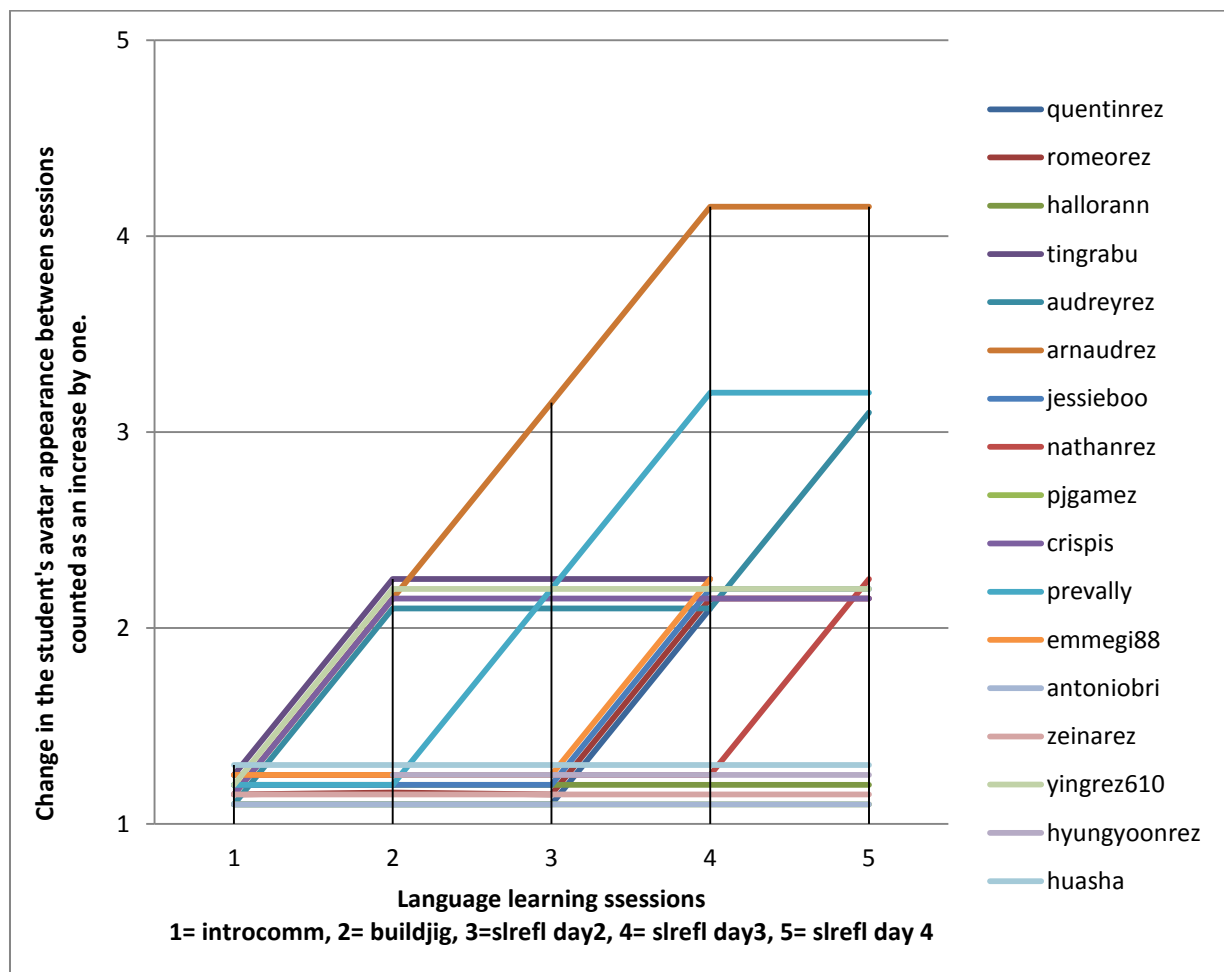
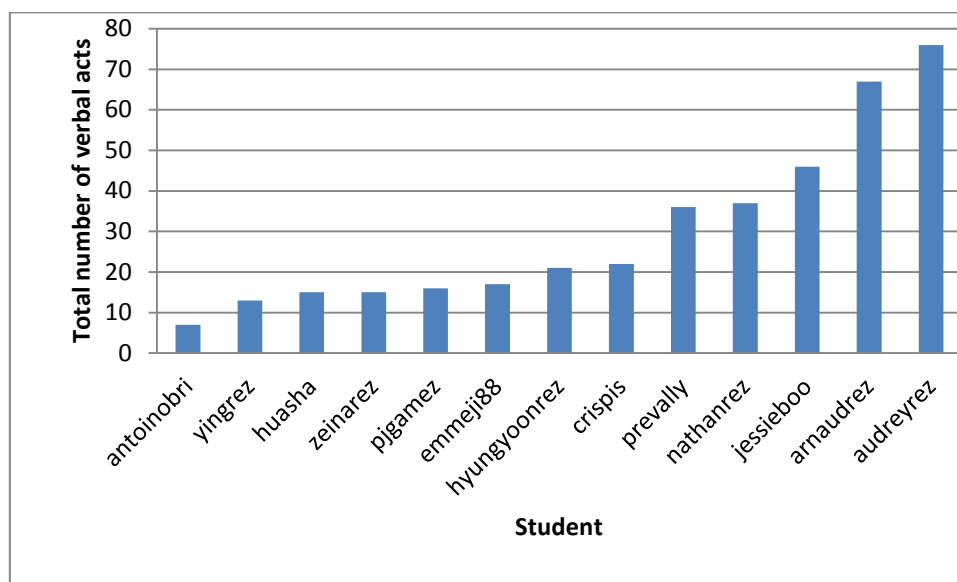


Figure 9: Evolution of students' avatar appearances during the course adapted from Warburton (2008)

Figure 9 shows that five students in this study made no modifications to the appearance of their avatar during the course: the figure shows a horizontal line for each of these students for the totality of the five sessions on the x axis. One of these students, Zeinarez, explained that, at first, she did not have the time to change the appearance of her avatar and then finally that she felt that she did not really want to change her appearance. Possible interpretations of Zeinarez's comments might be that she either liked the way her avatar looked or felt the need to adopt a persistent identity, with respect to the appearance of her avatar, in order to be identified and re-identified consistently throughout the course. Although the student's avatar appearance was persistent we can question whether her identity evolved otherwise, in light of co-construction theories of identity which stress that identity is continually constructed with reference to the environments, groups and people with whom a person interacts. In this study we did not explicitly question participants about their inworld identity. Further research into identity in synthetic worlds, however, needs to consider how participants perceive the identity they feel is their own as well as how they perceive the identity of others in these environments.

For the four of the five students who did *not* change their avatars' appearance: *Huasha*, *Antoinobri*, *Zeinarez* and *Pjgamez* ( Figure 9), our analysis reveals that these students were amongst the five students to have made the *least* number of verbal acts during the interaction in the *Second Life* reflective sessions (Figure 10). These participants made an average of 13 verbal acts during a session, compared to an average, for any single participant in all three workgroups analysed, of 30 verbal acts. A lack of

personalisation of the avatars suggests that the students have perhaps not passed the "technological and competency threshold" (Warburton, 2008: para.4): they are not yet able to manage the graphical interface of the social networking environment and interact with it. They have, thus, not accessed the "threshold of care" (Warburton, 2008: para.6). This threshold is when users start to identify with their avatars, feeling an emotional pull towards their virtual selves and starting to care about their avatar. At this threshold the user feels the necessary embodiment to invest in the synthetic world and in the interactions within this world. Psychological appropriation of an avatar may, thus, be easier if the user has reworked his/her avatar, leading to an increased commitment to the activity in general. Another interpretation is that these students, due to motivational reasons, are generally engaging less with all aspects of the course.



**Figure 10: Number of verbal acts for students in groups GA, GL and GS during slrefl sessions day 2**

Our interview data also suggests that an avatar's morphology may not only influence L2 verbal participation but also with whom students decide to network and interact inworld or not. One student, after describing her group member *Antoinobri*'s avatar as similar to that of a monster with a small head and large chest, refers to this:

[Researcher, 27:18-27:29]: est-ce que le fait que son avatar ait un peu l'apparence d'un monstre a changé votre manière de communiquer avec lui ?

Did the fact that the avatar was a little like a monster change how you communicated with that avatar?

[*Hyungyoonrez*, (FFL) 27:30-27:32]: hum on n'a pas de tout communiqué [\_chuckles] erm we didn't communicate at all [\_chuckles]

Our study, thus suggests the necessity to encourage students to personalize their avatar appearance in order to encourage their L2 verbal communication inworld but that there are certain limits that when reached influence with whom students decide to interact.

## 6 Nonverbal communication with respect to L2 verbal participation

Having seen the role avatar appearance played in L2 participation and interaction in our study, we now turn to whether the students created their avatar identity in part through nonverbal communication acts (see Table 1) and whether the use of these acts impacted L2 verbal participation. To study this, we analysed the frequency of nonverbal acts used by different participants in our transcription data. Our analysis shows that certain students repeatedly performed the same nonverbal acts. For example, the avatar of *Arnaudrez* frequently used the kinesic act of drinking from a can of beer whilst the participant

*Emmegi88* repeatedly changed her sitting posture, leaning in and out when she verbally interacted with the others. Our interview data shows how this nonverbal communication was perceived by the students' peers. *Audreyrez* described that all of her workgroup members used gestures but that *Arnaudrez's* drinking gestures created a classmate who was funny and unique. Another student explained that participants drew attention to their avatar's image by 'ego-tripping' through their use of gestures. Thus, our data shows that the students' inworld identities were created in part through their nonverbal acts in addition to their avatar appearance.

We questioned whether the students who frequently used nonverbal communication acts utilised these to occupy the space during the *Second Life* reflective sessions so that they were seen as participating without necessarily interacting frequently in their L2. To analyse this, we examined the total number of nonverbal acts compared to verbal acts during the *Second Life* reflective session on day 2 for the workgroups which included the participants *Arnaudrez* and *Emmegi88* whose nonverbal acts were considered as part of their identity by the other students.

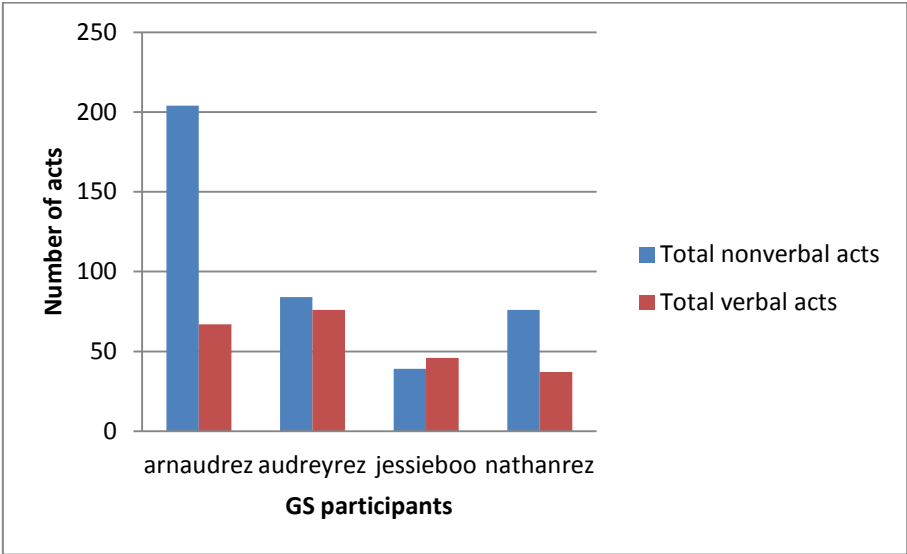


Figure 11: Number of verbal and nonverbal acts by participant for workgroup GS during slrefl day 2

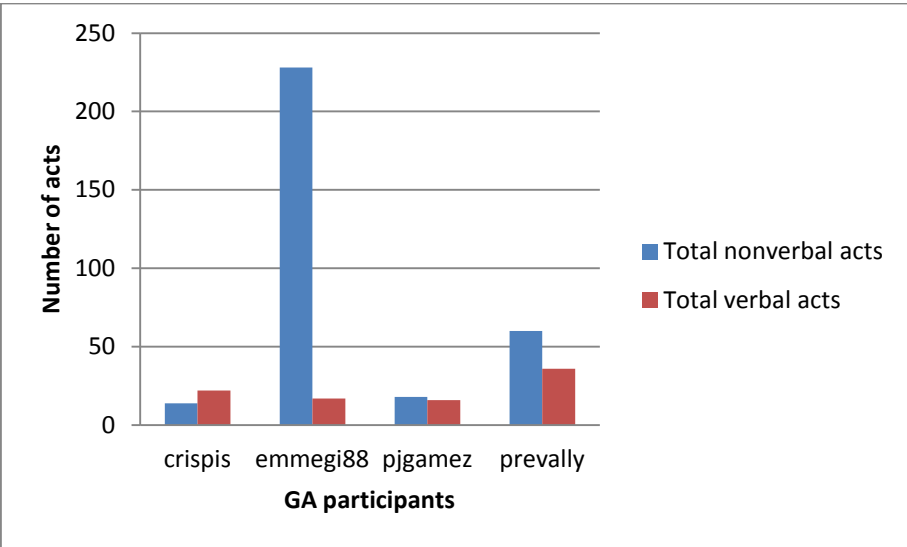


Figure 12: Number of verbal and nonverbal acts by participant for workgroup GA during slrefl day 2



Figure 11 and Figure 12 show that the two participants *Arnaudrez* and *Emmegi88* used considerably more nonverbal acts than the other workgroup participants. Although the quantity of verbal acts for *Emmegi88* was considerably smaller than for *Arnaudrez*, the total number of L2 verbal acts for both students was within their workgroups' norms. Therefore, it appears that they did not simply use nonverbal communication to occupy the space and be seen as participating within the reflective sessions but rather in parallel with L2 verbal interaction.

To examine more closely whether the nonverbal communication acts of the avatars allowed the students to engage more in the L2 verbal interaction, two assumptions were formed and tests of statistical significance performed on same data from the *Second Life* reflective sessions on day 2 for workgroups GA and GS.

**A1:** The more nonverbal acts a participant performs, the more verbal acts s/he performs.

**A2:** An increase in the number of nonverbal acts performed by a participant results in an increase in the total length of the participant's verbal acts.

None of the participants in GA and GS had used *Second Life* prior to the course. Therefore, all students had spent the same amount of time inworld when data was collected. Our data and results are available in an open-access distinguished LETEC corpus (Wigham & Chanier, 2012).

The analysis of variance used to test A1 and A2 was a one-way ANOVA test for which the populations from the samples obtained must be normally distributed and the samples independent. To ensure that a one-way ANOVA analysis of variance could be performed, considering the small sample sizes, a Shapiro-Wilk test of normality was conducted. It showed that the population from which the samples were obtained was normally distributed being greater than 0.05 with the results of 0.90 for verbal acts and 0.86 for nonverbal acts.

Using the one-way ANOVA test to test A1, the two data sets were, thus, the number of independent verbal acts and number of independent nonverbal acts performed for each participant. We define two acts as being independent when the time difference between the start time of *act n+1* and the end of time of *act n* is greater than the standard deviation for the time delays between all acts in the session performed by any one participant (see Figure 13).

Act type	Actor = crispis. Contents of act.	Start time of act in seconds	End time of act in seconds	Difference End time and start time
v	ouais	11,95	12,69	
nv	lean_forward	44,01	46,34	31,32
nv	look_up	66,81	68,74	20,47
v	je crois que que on ne sait pas	184,71	222,3	115,97
v	euh je crois que pour le moment	313,2	357,2	90,9
v	ils nous ont dit que sous que l	372,2	403	15
nv	move(head)	471,54	473,36	68,54
nv	lean_forward	484,04	485,96	10,68
nv	lean_back	488,19	489,84	2,23
nv	lean_forward	505,67	508,17	15,83
nv	lean_back	509,48	511,85	1,31
v	oui	514,8	515,7	2,95
v	[_laughs] moi non plus	524,5	526,19	8,8
v	euh j'ai une mais les autres je	540,8	545,51	14,61
v	euh pardon vous pouvez répé	605,59	613	60,08
v	euh non mon {snapshot} se tr	619,4	625	6,4
v	mais il y a un symbole de hm	634,9	641,3	9,9
v	bon je [_laughs] je ne sais [ch	677,4	726,21	36,1
v	bon hier j'ai essayé un peu av	733,4	784	7,19
nv	look_up	870,53	871,51	86,53
	Standard deviation for all actors = 25,69			
	Independent acts highlighted		independent verbal act	
			independent nonverbal act	

**Figure 13: Example of the identification of independent verbal and nonverbal acts**

The result of the first one-way ANOVA analysis shows that the variance between the number of independent nonverbal acts performed by each participant and the number of independent verbal acts performed by each participant was not statistically significant ( $F = 0.121, p \geq 0.5$ ). Our assumption (A1) was therefore not confirmed.

The two data sets used to test A2 were the count of independent nonverbal acts per participant and the total length of all independent verbal acts for the participant (in seconds) during the session. As our assumption concerned individual participants, the tests were performed on the data for both workgroups GA and GS together.

The result of the second one-way ANOVA analysis confirmed our second assumption, showing that the variance between the number of independent nonverbal acts performed by each participant and the total length of each participant's verbal acts was statistically significant ( $F = 27.616, p \leq 0.001$ ).

To summarise, a student who performed a greater number of nonverbal acts did not necessarily perform a greater number of verbal acts. However, there was a proportional increase between the total length of all verbal acts performed by a student and the total number of nonverbal acts performed.

Our data suggests that whilst these students used nonverbal acts to help to establish their inworld identity. These students did not use the nonverbal acts to occupy the space but used them in parallel with interacting verbally in their L2. Indeed, the students' nonverbal communication helped support L2 verbal interaction because a student who performed a greater number of nonverbal acts took longer L2 verbal turns. We can question whether communication in the synthetic world in participants' mother tongues (L1) would provide similar results.

## 7 Conclusions and recommendations for encouraging L2 verbal communication through identity construction with respect to social networking in synthetic worlds

This study investigated inworld identity construction through avatar appearance and use of nonverbal communication and their effects on students' L2 verbal participation and interaction. The study was conducted within the framework of an architectural CLIL course which used the social networking environment *Second Life*. The results show, firstly, the importance students attribute to their avatar for L2 communication and as social capital. Secondly, they illustrate students' differentiation between inworld and first world communication which may be due to a distinction between first world and inworld personalities reflected through changes in avatar morphology. These changes affected how students addressed each other in their interaction and also students' level of L2 verbal participation: students who changed their avatar's appearance participated more frequently in their L2. Finally, our study showed that nonverbal communication acts also contributed to the construction of students' inworld identities and suggested a connection between these acts and L2 verbal participation: students' nonverbal communication helped support their L2 verbal interaction with an increase in use of nonverbal acts being related to longer L2 verbal turns.

Our findings suggest if L2 teachers wish to help students network within synthetic worlds, when doing this, they need not seek to choose morphological appearances with corporeal shapes. On the contrary, standing back from their first world identity may help their level of verbal L2 participation. However, students may need to be careful about the morphological shape of their avatar not being too intimidating. Furthermore, introducing students to the range of nonverbal acts that are possible within the environment may also accelerate the emergence of verbal language production, particularly the length of L2 verbal interactions. To conclude, encouraging students to construct an inworld identity by altering avatar appearance and using nonverbal communication acts may help increase students' opportunities for networking in their L2 within the synthetic world environment by supporting verbal participation. Although increasing L2 verbal participation will increase opportunities for potentially acquisitional sequences (Py, 1990), research must further examine ways in which synthetic worlds can foster language learning through increased verbal participation. We are currently exploring ways in which the use of the textchat modality combined with the audio modality in the verbal mode promotes opportunities for increased verbal participation and also feedback on language form (Wigham & Chanier, 2012b). We hope to extend this analysis to explore whether interplay exists, firstly, between students' use of the nonverbal mode of kinesics and their requests for language correction and, secondly, the teachers' provision of feedback and use of the kinesic modality.

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