Architectural design and language learning in Second Life

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Acknowledgements

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Abstract

This study investigates whether, by using a virtual world, it is possible to integrate architectural design and language (L2) learning in a Content and Language Integrated Learning (CLIL) approach and increase student motivation *vis-à-vis* L2 learning. We discuss the advantages and limitations of virtual worlds with reference to the two disciplines and describe the learning design for a higher education course which used Second Life (SL) for face-to-face and distance sessions. We present the course evaluation results. These revealed i) the greater interest in using SL for distance design, rather than face-to-face activities, ii) the need for progress to be made concerning our learning scenario so students feel they are understood clearly in their L2 and iii) the course design's contribution to collaborative group work and students' feeling they had progressed in both disciplines.

Introduction

Our study concerns a virtual world used in a Content and Language Integrated Learning (CLIL) approach for architectural design and foreign language learning, namely French as a Foreign Language (FFL) and English as a Foreign Language (EFL). We refer to a blended course, for architecture students, in which face-to-face sessions were delivered at their educational institution and distance learning sessions in Second Life (SL). The main course objective was for students to design inworld models built in collaboration in their foreign language (L2). We explain the design of our learning scenario and our data collection and analysis methodology. We present results from student evaluations concerning integrating the two disciplines and motivation *vis-à-vis* L2 learning.

Setting the stage

In European higher education institutions a validated L2 competence is required for Master's-level qualifications (Joint Quality Initiative, 2004) enabling recently qualified professionals to work easily throughout Europe. However, architecture institutions lack specialized courses for students to gain the specific language skills necessary for their profession. Indeed, language courses are often not integrated

into the process of architectural design learning. Thus, it is not necessarily clear what is at stake concerning language learning. This often leads to student indifference concerning improving L2 skills.

This study investigates, firstly, whether, by using a virtual world, it is possible to integrate architectural design learning and L2 learning in a CLIL approach. Secondly, whether, through such integration in a virtual world, student motivation concerning L2 learning can increase. The context for our study is the *Building Fragile Spaces* (BFS) course, held in February 2011, as part of the European Project ARCHI21[i].

A virtual world seemed a potentially interesting environment for combining architectural design and L2 learning in a CLIL approach because previous research suggests the affordances of these environments for both disciplines when considered individually. Regarding L2 learning, virtual worlds reduce student apprehension in expressing oneself in the target language (Schwienhorst, 2002). They thus disinhibit learners, allowing them to take risks while feeling safe to practise language (Teoh, 2007). Moreover, they provide rich target language input, thanks to avatars providing verbal and nonverbal communication possibilities (Wigham & Chanier, in print). Concerning architectural design learning, the advantages of virtual worlds as shared spaces beneficial for the co-existence of generative, analytic, and virtual thinking processes critical to design pedagogy is currently being considered (Garner et al., 2011). The benefits for distance synchronous design and design experimentation without real-world consequences are also forwarded (Gu et al., 2009).

Combining architectural design and L2 learning in a CLIL approach eliminates "the artificial separation between language instruction and subject matter classes" (Brinton et al., 2003, p. 2) by teaching non-language subjects through a foreign/second language (Marsh, Marsland & Stenberg, 2001). Students' language needs and domain-specific interests can thus be catered for in a very real way. It was felt appropriate to integrate L2 and architectural design learning in a CLIL approach, not only because both disciplines show interest in virtual worlds, but also because they are frequently taught using task-based scenarios requiring student collaboration. Regarding architectural design, a workshop approach is often adopted. Students, working in groups alongside tutors, must conceive a solution to a design brief

(the task). These solutions are refined during studio critiques with peers and tutors. The design brief is often formulated with respect to real-world architectural problems and presented graphically and verbally during a public jury, as architects would present projects to clients. Students must collaborate to conceive a solution to the task: "the design studio can be organized in a way that can motivate learning through discovery by collaborative engagement of students and instructors in the learning process" (Farivarsadri, 2001, p.6).

Concerning language learning, a task is defined as a "focused, well-defined activity, relatable to learner choice or to learning processes, which requires learners to use language, with emphasis on meaning, to attain an objective" (Bygate, Shehan & Swain, 2001, p. 12). Ellis (2003, p. 16) explains "a task is intended to result in language use that bears a resemblance, direct or indirect, to the way language is used in the real world." Figure 1 delineates Ellis' five task parameters (Ellis, 2003).
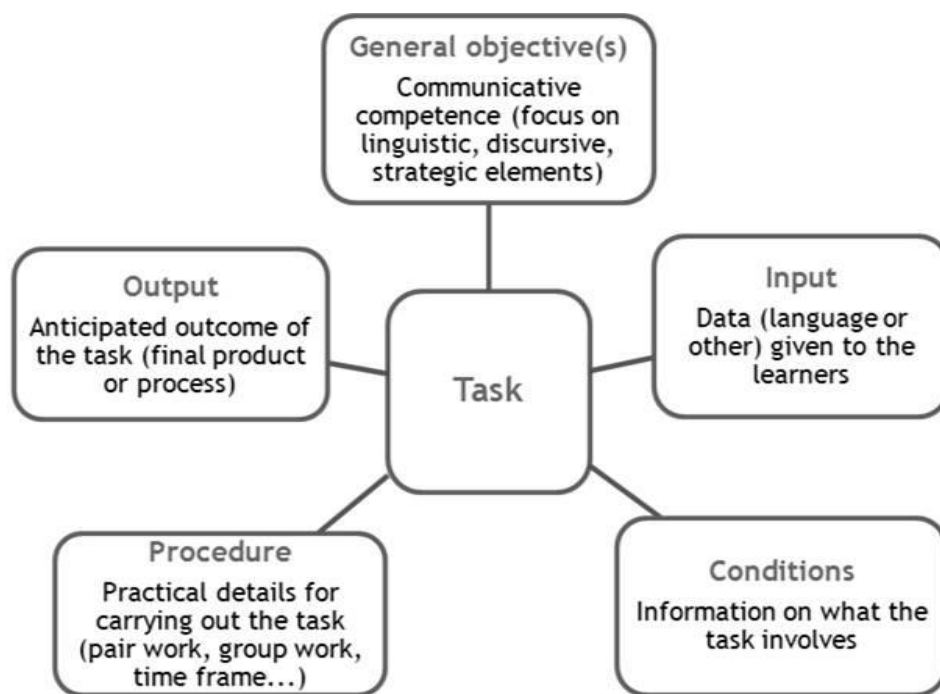

Figure 1. Five parameters of a task (based on Ellis, 2003)

A task-based scenario also seemed appropriate for a CLIL course in a virtual world, given the collaboration possibilities these environments offer (Dalgarno & Lee, 2010; Lim, 2009), which is essential in task-based scenarios. Furthermore, virtual worlds provide for authentic tasks where students

"learn by experiencing real activities rather than by direct instruction in a passive environment" (Bellotti et al., 2010, p. 90).

Case description

BFS was a five-day intensive design workshop. The overall objective was for students to create within four small workgroups, using their L2, a working, conceptual or critical model in SL. The model had to respond to a design brief pertaining to either the theme of *avatars*, *(e)spaces*, *scenario* or *land+scapes*, (Figure 2). Two workgroups had English as their L2 and two workgroups French. At the end of the course, the students had to present their model orally in their L2 before a public jury. This was a form of summative assessment.

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Consider   how   to   develop   the   spatial   archetypes   and
architectural  models  for  building  a  sustainable,  singular
educational  metaverse.  Think  about  the  aspects  of  foundation,
partition  and  envelope   in  your  answer  to  the  design  brief.
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Figure 2. *Land+scapes* design brief

SL was chosen for BFS because of the opportunities it offers for collaborative design and because our architectural project partners considered it provides opportunities for students and professionals to work together despite potentially different architectural approaches. In addition, SL's potential for recording and collecting data was considered easier than in other 3D environments[ii]. We used SL in two different learning situations. Firstly, in face-to-face architectural design workshops (Figure 3) where students were accompanied by two architecture tutors: one tutor being native French, the other a native English speaker. Students connected either individually, in pairs, or in their workgroup to SL using personal and institutional computers in the face-to-face classroom environment. During these workshop activities, they could communicate in the face-to-face classroom environment and not necessarily using the SL communication tools. The architecture tutors' role was to help workgroups advance in designing their models. Secondly, SL was used for compulsory language sessions conducted with all workgroup members by an EFL tutor or a FFL tutor working at a distance. Here, each student connected individually

to SL. The communication took place synchronously within SL. Students also participated in asynchronous language activities using *VoiceForum* (VoiceForum, 2011).

The synchronous language sessions in SL (Figure 3) were articulated around the architectural design scenario. These included a communication-focused introduction to SL (day one), a building CLIL activity (day two), and daily reflective sessions (days two, three and four). This pedagogical approach offered dual-focused aims for each activity (Table 1), learning architectural design being undertaken through the L2.
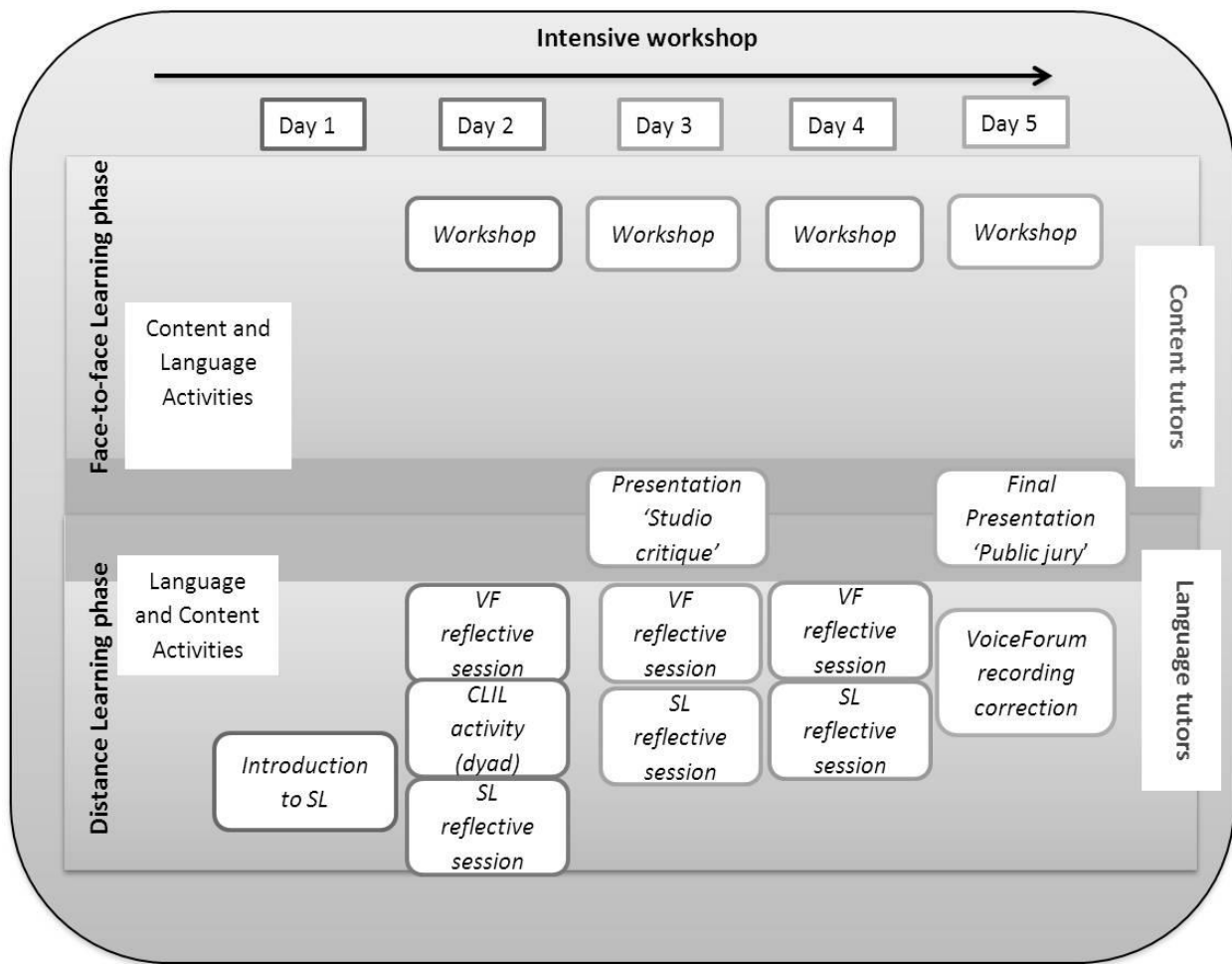

Figure 3. Structured representation of the learning scenario

Table 1. Synchronous language sessions: objectives

Activity type and name	Architectural design objectives	L2 objectives

Socialisation and communication "Introduction to SL"	Introduce students to multimodal nature of SL	Establish a communication protocol
Collaborative building (tool manipulation and building) CLIL activity	Introduce students to building techniques to aid them develop their model	Develop L2 communication techniques concerning the referencing of objects
Group SL reflective session	Develop critical thinking by negotiation Distinguish pertinent information for overall problem identification in their design brief	Help students to skill-up their L2 Acquire domain-specific vocabulary Develop a professional discourse

Let us now detail two sessions using Ellis' task parameters.

The CLIL activity was an introductory one-hour session to introduce SL building functionalities, which students had to use constantly throughout the course to develop their group model inworld, before presenting it for a studio critique in front of peers (day three) and before a public jury (day five). Students worked in subgroups. One student was designated as the helper, the other as the worker. Using 2D images of a built presentation kiosk, the helper had to direct the worker to assemble the kiosk from 3D components. The presentation kiosk was chosen in order to provide learners with an example for the presentation of their model on days three and five of the course. The helper and worker possessed information concerning the object's 2D or 3D characteristics. This information was unknown to the other student but of importance to solve the problem. Thus, to encourage collaboration and L2 interaction, the session incorporated a two-way information gap (Long, 1981). The CLIL activity allowed for physical collaboration between students, through the manipulation of objects, with the aim of building the kiosk. Verbal collaboration was also required to describe objects and give/understand the procedural instructions about how to combine these objects.
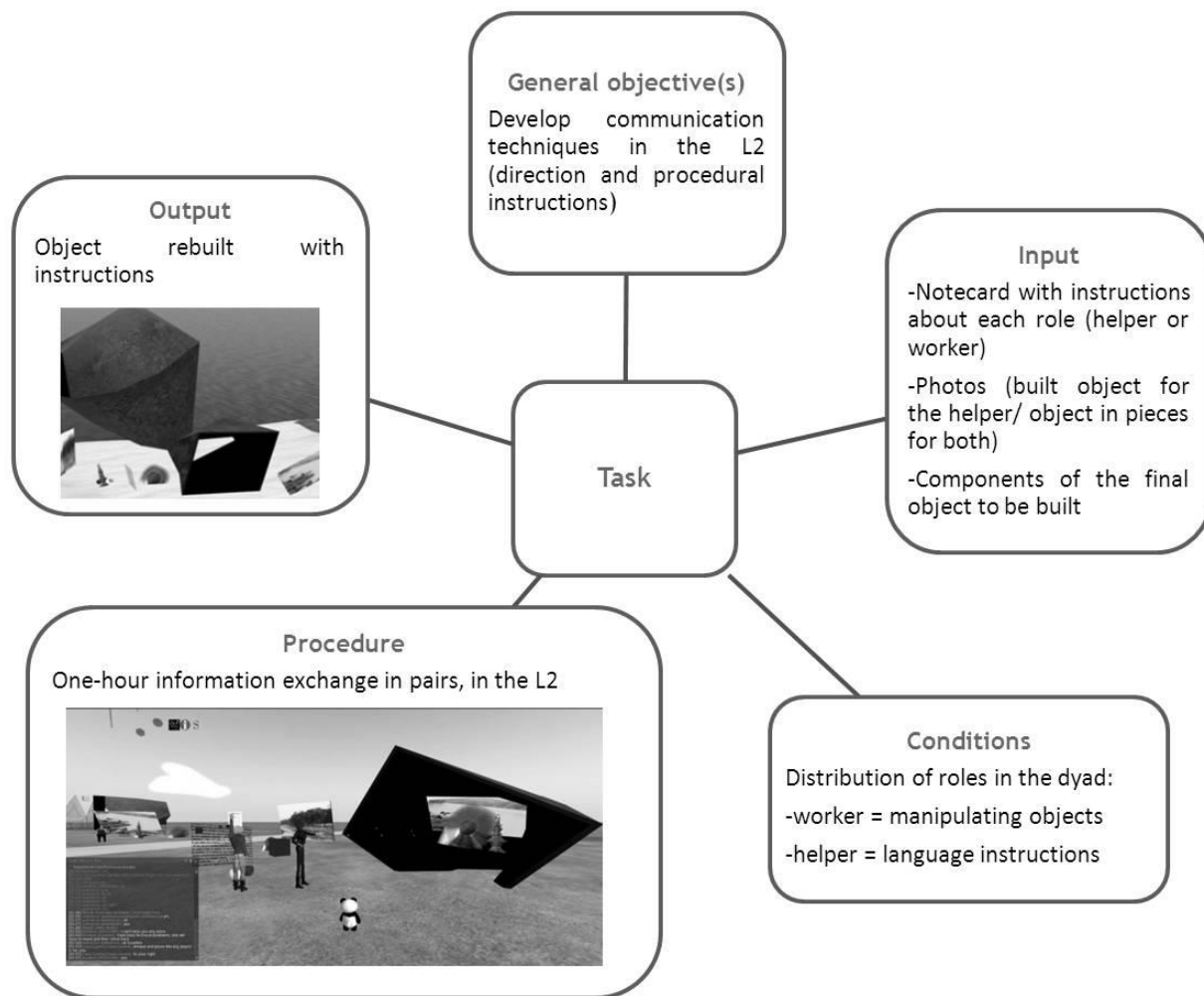
Figure 4. Parameters of the task for CLIL activity

SL reflective session was a one-hour group activity occurring almost every day. Language tutors, unaware

of what workgroups had done in 'workshop' sessions with their architecture tutors, had to help students

clarify their individual roles within the workgroup, negotiate their views about their architectural model's

advancement, and understand what architecture tutors expected from them. They also provided L2

corrections helping learners prepare for the presentations of their work in their L2.
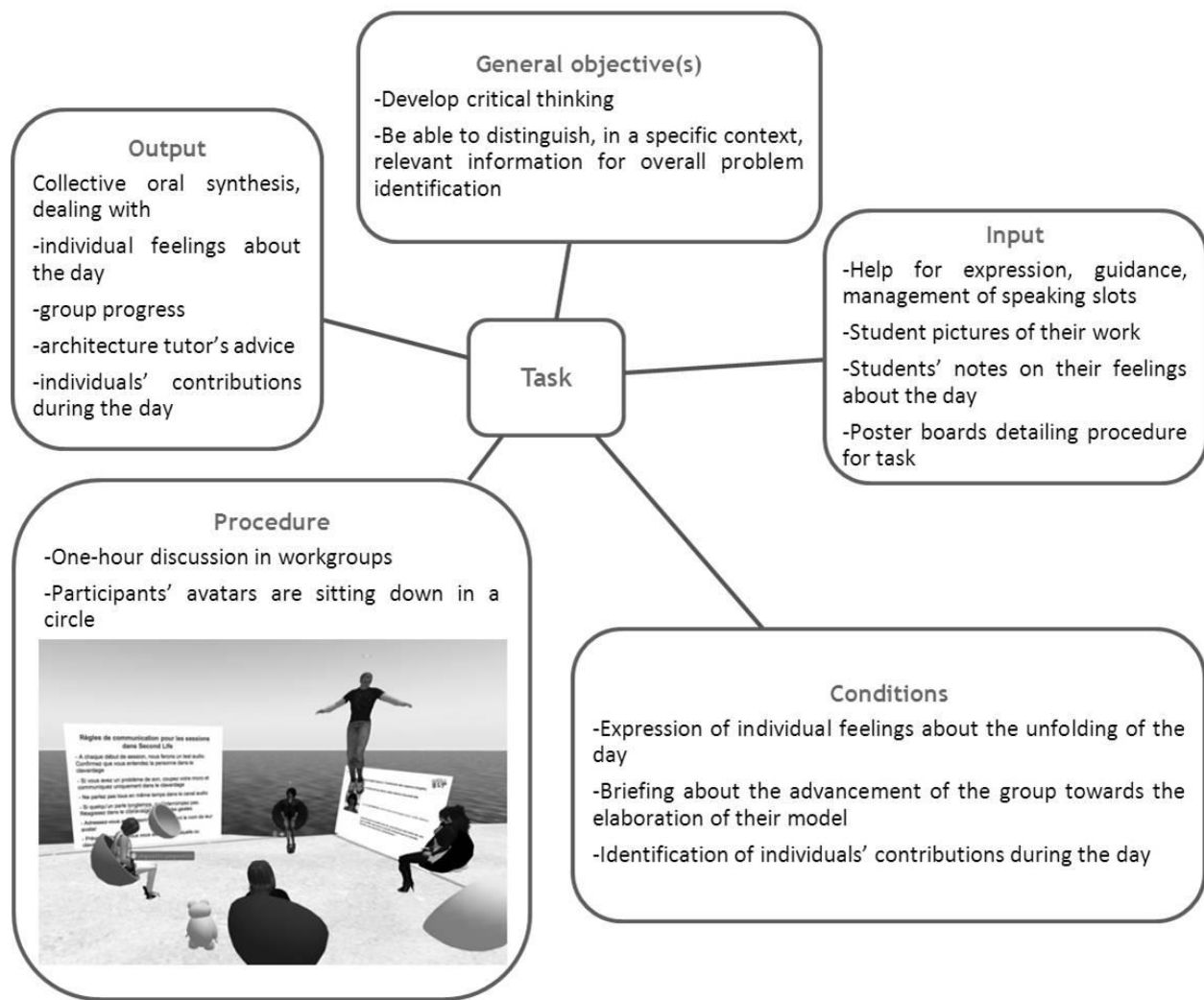
Figure 5. Parameters of the task for SL reflective session

The reflective sessions encouraged students to collaborate concerning their ideas: each learner had to explain his/her current contribution to the workgroup project and his /her reactions concerning the workgroup's progress towards responding to their design brief. The sessions provided opportunities to "stand back" from the task of producing a model to give students better understanding of ideas explored with their architecture tutors helping them advance towards the model creation.

The studio critique and final presentations took place both in SL and in the face-to-face classroom environment simultaneously so the students could show, through their avatar, their inworld models and so

that the language tutors, and the public jury on day five, could attend the presentations from a distance (Figure 6).

Figure 6. Presentation activity (in-class and SL views)

Student participants

The BFS course involved 17 undergraduate and Master's architecture students. Nine students had French as their mother tongue; the other eight students had a range of mother tongues (Figure 7).
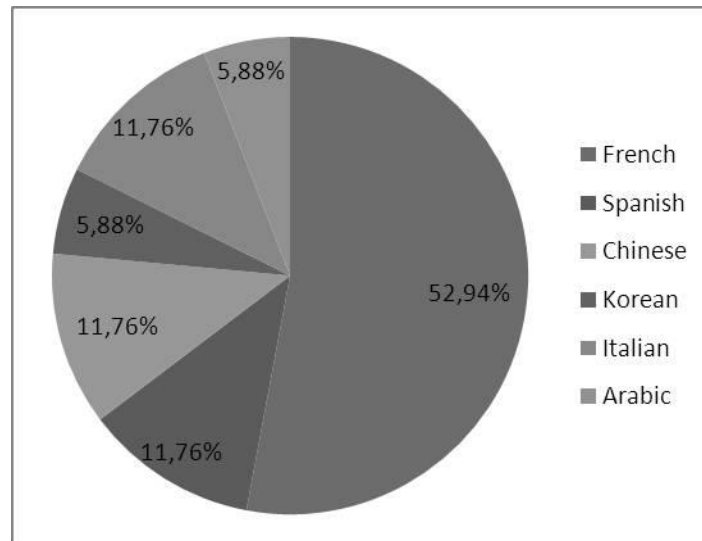

Figure 7. Mother tongues of students

Students' L2 levels in the EFL workgroups ranged from B1-B2[iii]. The FFL workgroups were of A2-B1 level. Eleven students had prior experience of intensive design workshops and one student was familiar with distance-learning. Two students had previously used SL.

Evaluation methodology

Data collection tools included informed consent forms which explained the project to participants and asked for their acceptance of using data for research. We administrated, online, pre-questionnaires regarding learner profiles and post-questionnaires for course feedback. Data from all inworld activities was collected using the screen capture software *Fraps* and chat logs. Multimodal transcriptions of these data were undertaken according to a predefined methodology (Wigham & Chanier, in print). Post course interviews were conducted and recorded online with five students. These data, alongside the learning design and the research protocol were structured into an open-access LEarning and TEaching Corpus (LETEC, Chanier & Wigham, 2011). A researcher also collected data from the face-to-face environment which we are currently processing.

This case study presents data from the post-questionnaires. The online questionnaire elicited responses in two areas: the pertinence of mixing SL, architecture and language and a course evaluation. It consisted of 48 closed questions. A five-point Likert scale ranging from 1 (1=totally agree) to 5 (5=totally disagree) was used to gauge student reactions to BFS. A four-point scale from 1 (1=not at all) to 4 (4=a lot) was used to evaluate students' impressions of L2 progression. Our questions concerning student opinions are of a qualitative nature (Miles & Huberman, 1994). They are collected in a quantitative manner (Herring, 2004) e.g. closed questions providing summaries of frequencies. These numerical data are analysed from a qualitative perspective: we study and interpret the response patterns.

Results

We present students' opinions of the course which will allow us to infer, firstly, the benefits and limitations of integrating architectural design and L2 learning in a CLIL approach using SL and, secondly, the pertinence of this integration *vis-à-vis* student motivation concerning L2 learning.

Student post-questionnaires showed that, overall, the students believed integrating L2 and architectural studies was a relevant approach to learning (Figure 8) and that this approach allowed them to develop skills in both disciplines (Figure 9).
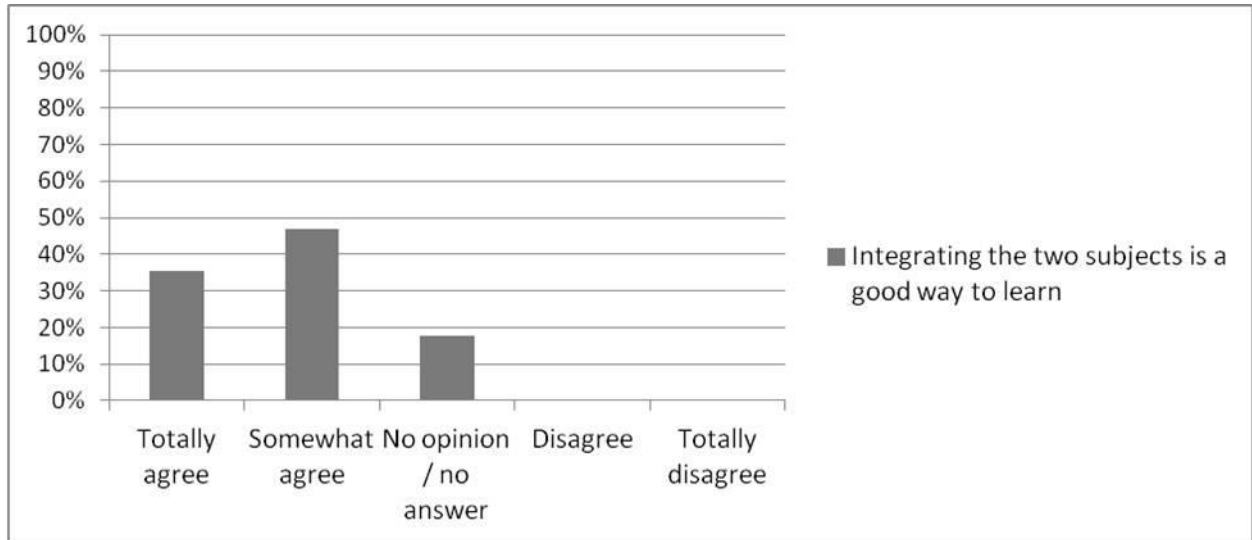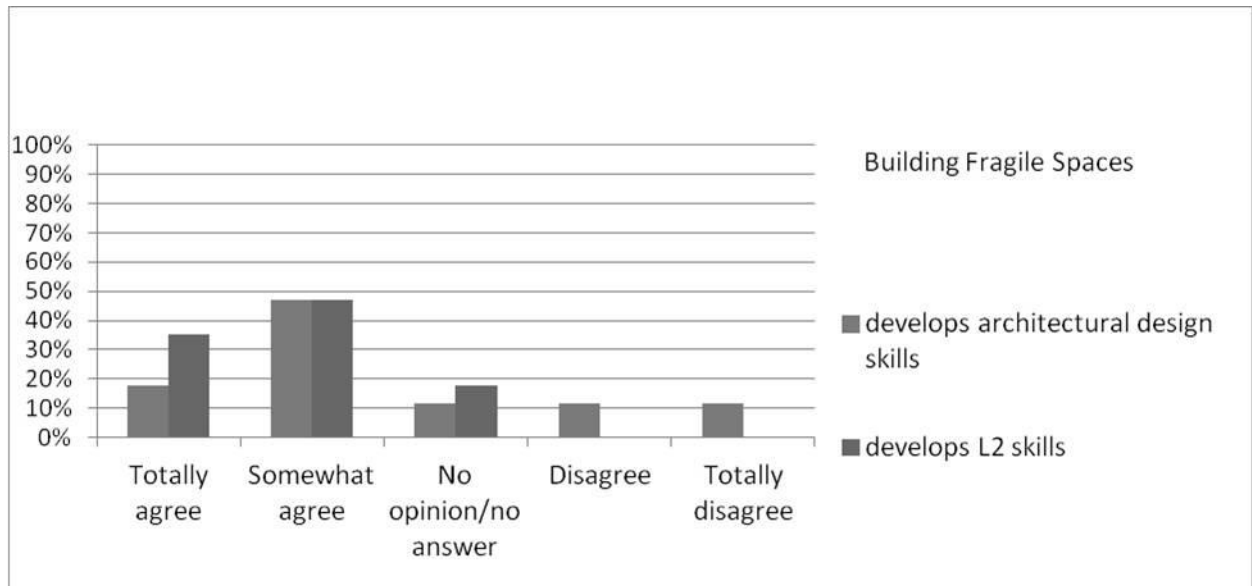
Figure 8. Students' opinions about CLIL

Figure 9. Students' opinions about the BFS course

The students perceived SL to be an environment of interest for language learning and architectural design (Figure 10). However, they suggested it to be slightly more interesting for distant collaborative architectural work than for face-to-face architectural design.
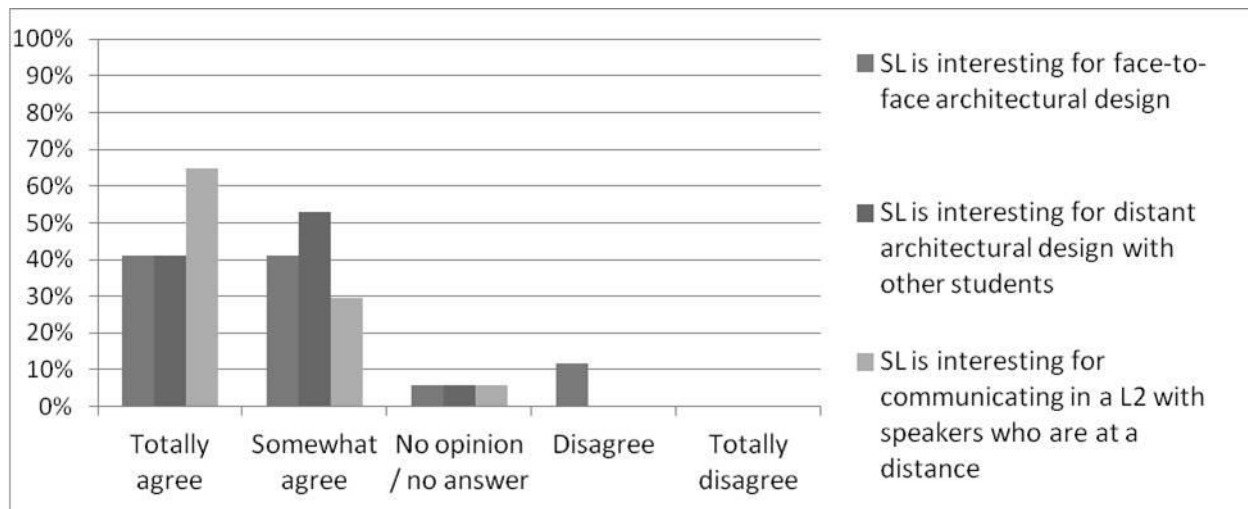
Figure 10. Students' opinions about SL

Students did not judge that working in their L2 was very difficult (59% of students disagree compared to 18% who agree). Although, overall, the students suggested that it did not make concepts difficult to understand (59% of students disagree compared to 30% who agree, Figure 11), slightly more students (12%) believed CLIL impeded more on L2 comprehension than on L2 production. Half of the students acknowledged that they encountered difficulties presenting their work in their L2, particularly concerning clarity. However, almost all of the students accepted this challenge and considered that presenting their work in a language they did not completely master was not a problem.
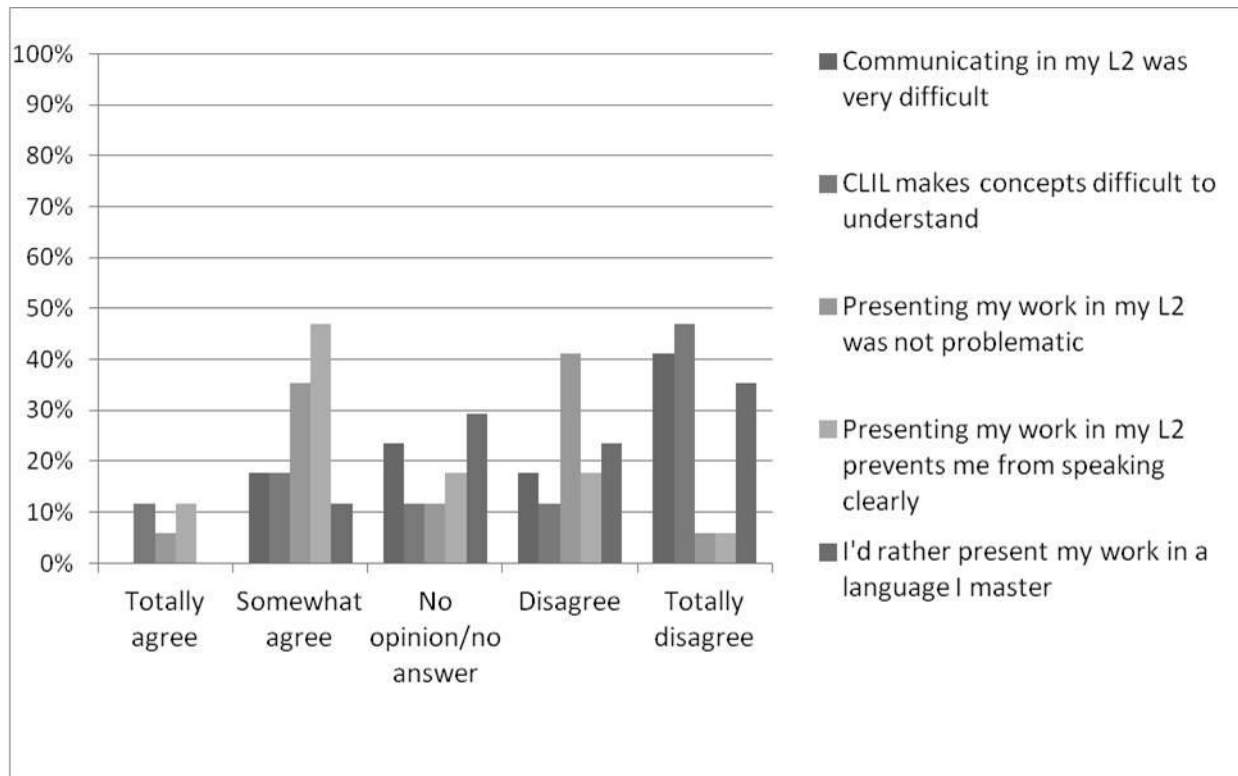
Figure 11. Students' opinions about CLIL's language aspect

Concerning impressions of language progress made, most students considered that the course helped them to progress in understanding others (65% a little, 24% a lot, Figure 12) and also in talking to others (29% a little, 47% a lot). Students also felt they made progress in feeling more comfortable when speaking in their L2.
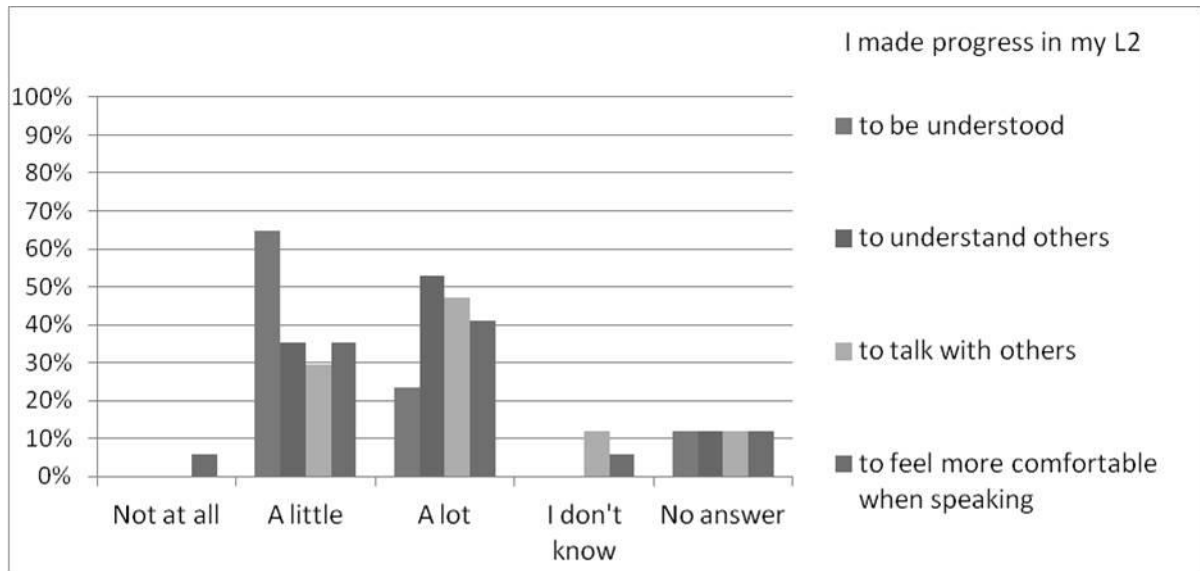
Figure 12. Students' opinions about L2 progression

The students' feeling of having progressed in their L2 skills did not appear to take away from their architectural design learning and indeed they found this approach motivating (Figures 9 and 13). Although language tutors could be of no help with architectural issues (instead their role was to support communication and exchanges), Figure 14 illustrates that the students found the L2 SL reflective sessions pertinent in contributing to their overall architectural task, firstly because they allowed students to better understand their overall group project (71% of students agree) and, secondly due to the reflective sessions' contribution to the cooperative or collaborative nature of the group work (80% of students agree) achieved by all four workgroups (100% of students agree).
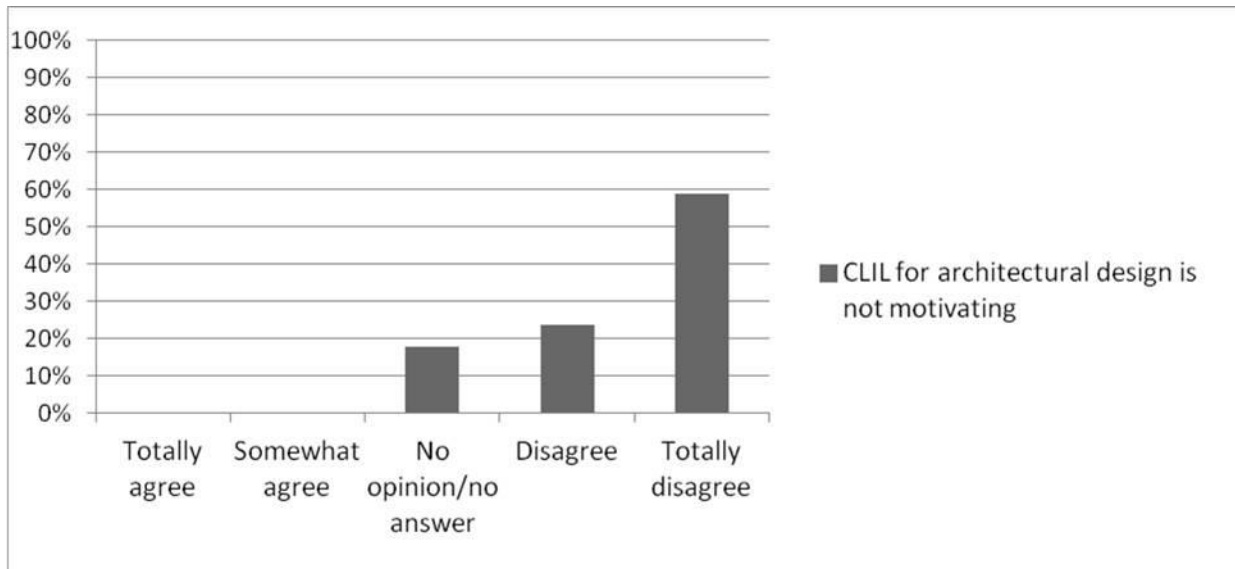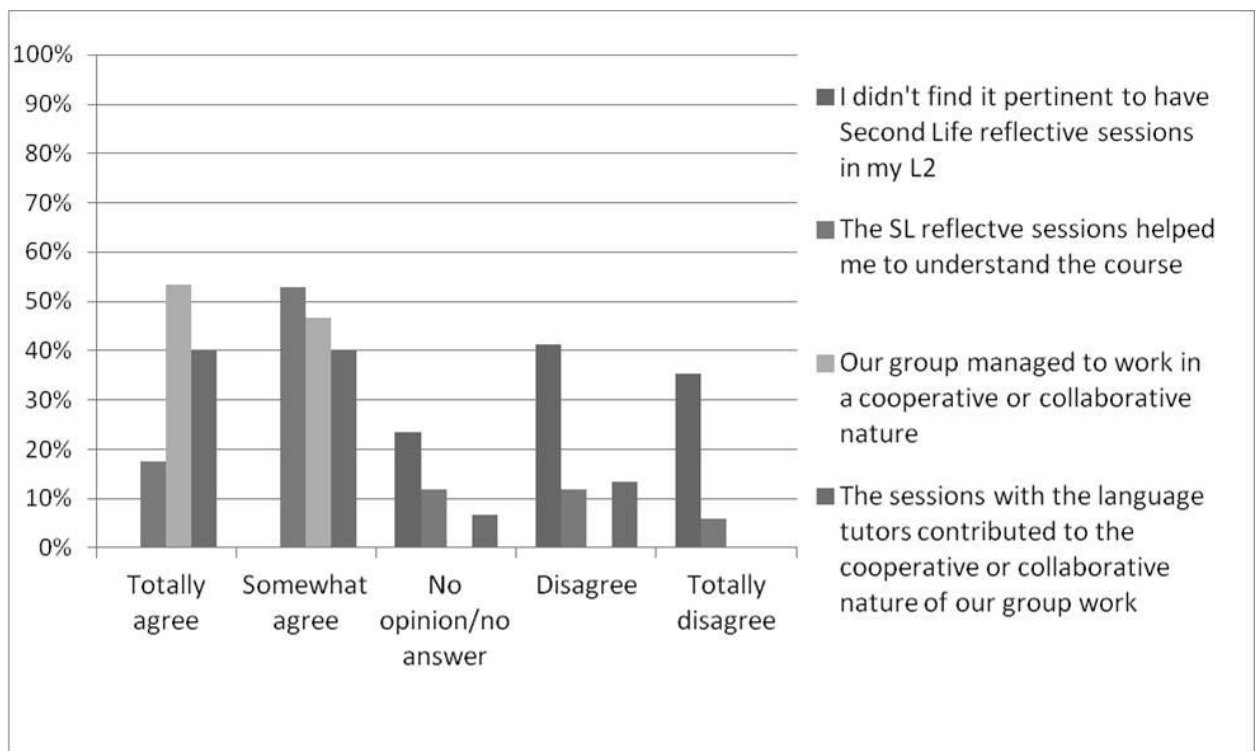
Figure 13. Students' opinions about CLIL

Figure 14. Students' opinions about SL reflective sessions

Discussion

Whilst studies show that CLIL courses are often led by a content teacher who is a speaker of the target L2

or a L2 teacher who has knowledge of the target subject, our study suggests the possibility for content

teachers and language teachers to design courses together, without being experts in each other's discipline. We believe this is partially due to the environment chosen - virtual worlds holding appeal for both disciplines. It is also thanks to the rigorous learning design which placed importance on course environments and on sessions which included tasks with dual-focused objectives. Our results show students perceived these sessions as contributing to their main course objective of creating an inworld model responding to a problem brief and to students' feeling of progression in both architectural design and L2 skills.

Our study suggests that, whilst integrating architectural design and L2 learning in a CLIL approach using a virtual world environment is possible, it is more pertinent to adopt the virtual world for distance activities: results showing a stronger interest for using SL for distance communication and architectural design than as a tool in face-to-face architectural workshop activities.

Concerning distance communication activities, our results show that activities addressing students' L2 comprehension difficulties need to be introduced into our learning scenario. Some progress must be made so students feel that they are understood clearly in their L2, particularly concerning presentations of their work. This difficulty is shown across the FFL (A2-B1 language level) and EFL workgroups (B1-B2 level). Difficulties are, thus, not linked to L2 level. In our task-based scenario, we should introduce supplementary communication activities to prepare students for oral presentations by introducing suitable language structures.

Dalgarno and Lee (2010) forward that 3D environments allow rich and effective collaborative learning. Our results show that all workgroups managed to work in a cooperative or collaborative nature and that the L2 SL sessions strongly contributed to this (Figure 14). They also contributed to students' overall understanding of the course and feeling of L2 progression.

Students suggest CLIL is a motivating approach to architectural design. Perhaps, because the dual-objective activities meant students' domain specific interests were catered for in a real way in activities which also encouraged L2 communication through information gaps and idea exchanges. Our results show that even if students had language difficulties, they preferred to persevere through these

rather than resort to languages they mastered to accomplish the tasks (Figure 11). This displays their motivation regarding language learning within this context.

The fact that the students feel their L2 production and comprehension skills developed (Figure 12) may be, in itself, a motivational factor. Indeed, because tasks designed for SL sessions prompted students to collaborate in their L2, they may have led to potentially acquisitional sequences (Py, 1990) - conversational sequences involving language negotiations that encourage L2 acquisition.

The virtual world environment may also have contributed to students' feeling of L2 progression. Indeed, previous research (Teoh, 2007) indicates that in virtual worlds students are at ease because they can make language mistakes without fearing consequences.

Conclusion and recommendations

Previous studies have forwarded the affordances of using virtual worlds for architectural design learning and language learning. This study has investigated whether, using a virtual world, it is possible to integrate architectural design and L2 learning in a CLIL approach. The BFS course studied was prompted by a need to increase architecture students' motivation for L2 learning by catering for their language needs and domain-specific interests simultaneously. Our case study proposes a possible learning scenario for a CLIL course in SL and describes results from student questionnaires showing that adopting this approach was genuinely interesting and motivating for students who felt they had progressed in both architectural and L2 skills.

Our study offers leads for educators wishing to design and deliver similar courses in virtual worlds. Firstly, it may reassure educators interested in CLIL that they do not need qualifications in both content and L2 subjects. Rather, professionals from each domain can work together to design activities with dual-focused objectives if an environment pertinent to both domains, such as virtual worlds, is chosen. Secondly, our results show students' interest in virtual worlds for distance, rather than face-to-face, architectural design activities. Similar CLIL courses involving partner institutions in different

countries may further student motivation whilst increasing the need for students to communicate in their L2.

We would recommend future investigations in other disciplines and language learning to expand CLIL research in virtual worlds. Analyses of the same learning scenario conducted in other virtual worlds would also help better understand virtual worlds' potential for architectural Content and Language Integrated Learning.

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Supplementary Material and Resources

ARCHI21 SLURL: http://maps.secondlife.com/secondlife/ARCHI21/79/120/23

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[i] Architectural and Design based Education and Practice through Content and Language Integrated Learning using Immersive Virtual Environments for 21st Century Skills'. The project is funded by the European Commission as a part of the Education and Culture Lifelong Learning Programme, KA2 Languages, DG EAC/41/09, llp-eacea-KA2-MultProj-ARDNM.

[ii] For example, the possibility to partition and configure land plots so that they are sound tight which facilitates the recording of audio data.

[iii] Common European Framework of Reference for Languages.