Towards Digital Immersive and Seamless Language Learning

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Abstract. Modern technologies facilitate new forms of learning. Technology-enhanced language learning (TELL) has seen dramatic changes in the facilitation of self-directed learning opportunities, but also in enhancing the learning experience in classroom-based formal language learning. In our study, we investigate the potential of new technologies and want to find out how immersion teaching is supported through seamless learning approaches.

Keywords: Immersion · Seamless language learning · CLIL · e-Portfolios · Technology-enhanced learning · Formal learning · Informal learning · Mobile learning · Smartphones

1 Introduction and Concepts

Immersion is one of the key pedagogic concepts in language teaching [1]. The idea behind immersion teaching is to embed learners in a linguistic and cultural environment that is equivalent to that of a native speaker, thus facilitating acquisition of the foreign or second language (FL, L2) in a simulated mother tongue (L1) situation. This method stands beside other more traditional language teaching approaches that focus on the acquisition of linguistic concepts and competences (grammatical, communicative, etc.). Historically, language immersion can be traced back to the post-WWII days with the establishment of Ulpan courses in Israel that aimed to teach Hebrew to new immigrants. In these settings, students were instructed in the Hebrew language and culture for better integration. The idea was taken up in other countries, and, by the mid-1980s, language immersion had developed a strong foothold in various bilingual communities and in the teaching of lesser-used languages in Wales, Quebec, Brittany, and elsewhere [2]. Primarily adult-oriented in the outset, the high motivation and intensity of the approach led to successful learning outcomes and a positive perception by language learners [3]. More recently, the approach has been transferred and somewhat modified to cover 'content and language integrated learning' (CLIL) in general foreign language classes. Here, certain subject disciplines are taught in the target language to facilitate not only FL learning but also subject knowledge and competences [4]. Still, despite large similarities, there are also important differences between immersion and CLIL [5].

In technology-enhanced learning (TEL), immersion takes a somewhat different perspective and mainly refers to the perceived technology-facilitated environment, such as 3D worlds, games or ambient learning displays [6, 7]. In this short paper, we propose

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to merge the two concepts into a seamless language learning experience and to use modern learning technologies to simulate a situated native environment for immersion.

Seamless learning can be described in a multitude of ways. Conceptualisations and definitions vary from 'the seamless integration of technologies into classrooms […]' to marking 'the border between formal and informal learning or individual and social learning' [8]. Other experts define seamless learning as 'learning wherever, whenever and whatever' [9].

In principle, we see three main bridging functions in seamlessness: (1) formal – informal; (2) across devices and applications; (3) blended learning, i.e. scenarios spanning online and offline episodes of learning (cf. [10]). Taking the conceptual and terminological versatility of seamless learning into consideration, a certain consensual approach in the scholarly literature can be noted, though: common to most definitions is the aim to support continuous, fluid learning experiences – mainly driven by the learner's desire to inquire or to investigate. The concept of seamless learning is to make the transitions between the different learning situations and context as smooth as possible [11].

The question arises how technology can make a language learning experience fluid and student-centred, focusing on learning/teaching designs that span different activities and contexts. The following chapter seeks to investigate formal and informal learning contexts (mainly at tertiary level), their applicative scenarios and consecutively their conceptual proximity to seamless learning.

2 Formal/Informal Learning and Its Relation to Seamless Learning

There is little doubt that technological innovations like the Internet have initiated a vivid discussion concerning the reformation or adaptation of higher education in general [12–16]:

Higher education is a dynamic, complex system embedded in an even more dynamic and complex supersystem - human society. Technological innovations have radically changed this supersystem […] [17].

However, Wiley [17] suggests that especially technological developments have often not been didactically implemented in tertiary education curricula:

While commercial industries have converted these technological advances into consumer benefits, thereby making customers happier and improving their own financial bottom lines, higher education has largely ignored these changes in its supersystem.

In his paper, Wiley explicitly emphasises a certain shift concerning learning techniques in the digital age from formal, institution-based education to everyday or informal learning (learning in extra-curricular settings [13]). In general, Wiley argues that formal learning within an institutionalised context (seen from a learning-theoretical point of view) is something analogue, tethered, isolated, generic, consumption-oriented and closed, whereas informal learning (e.g. situated, ubiquitous and extra-curricular learning) focuses on digital, mobile, connected, personal, constructivist and open learning performances and therefore pays conceptual attention to the technological developments of the 21st century.

Informal or everyday learning within a digital context is frequently carried out with mobile devices such as the smartphone or a tablet-PC [14, 18, 19]. In order to establish a holistic, fluid and 'seamless' learning approach, it is of great importance to consider the mobile device as a ubiquitous interface between state-of-the-art culture, everyday life and learning-outcome-oriented and student-centred learning in the classroom [17].

Ubiquitous learning means that students can learn *wherever* and *whenever* they want, but does not explicitly imply or emphasise the idea of establishing a fluid and smooth transition of learning experiences between different settings (e.g. classroom and informal learning). Seamless learning, on the other hand, seeks to create coherent and interdependent learning designs by considering learning in class and learning in context as one interconnected learning space without local and conceptual borders. The learning space is open [17] and rejects the dichotomy of formal/informal learning as two separate learning environments.

Seamlessness in informal learning environments also takes note of the context and changes thereof. In order to facilitate that learning in a situated, ambient, and open space-time can happen, the design ideally provides more than just content items [7].

To promote the approach of seamless learning, various studies suggest that 'seamlessness [is] achieved by bringing the same artefacts (data on mobile devices) into different social settings and times.' [8]. The learner, therefore, gathers, processes, and (re-)shares various artefacts (i.e. learning objects) in different social and local settings and considers the reflection on those artefacts as a holistic learning performance (independent from space, time and setting). In our approach, however, we aim to de-emphasise the content objects/artefacts, and instead focus on the learning interaction design for immersion, thereby creating a learner-centred overarching experience that is both, situated and outcome-oriented.

3 Pedagogic Design for Seamless Language Learning

Designing new seamless learning spaces is a key challenge for educators and language teachers. One of the issues connected to this is the lack of control of devices, content, and contexts, which takes the cognitive and technological support out of their hands. This often leads to criticism of the approach in the teaching community – sometimes even concluding in a general ban of new technologies such as smartphones in classrooms. Specht [20] calls it 'a top-challenge for most educators to adapt their instructional model for opening up and bridging to informal learning outside the classroom'. Keeping the attention and focus of learners on a set task is yet another difficulty rooted in the pedagogic design.

While we recognise these challenges, we would like to propose that modern technologies and informal learning opportunities, nevertheless, offer hitherto unknown possibilities of extending the learning experiences to authentic contexts from real life, which is especially useful for immersive FL learning. The unpredictability of real life situations reflects the challenges posed to language learners and leads them to seek out ways to cope with them linguistically and intellectually. Hence, this constitutes a key component of immersive language learning and would need to be addressed in the pedagogic design of building up competences in this area.

Following from this, we believe it to be of great importance that teachers recognise the opportunities available through seamless learning, and open their approaches to immersive pedagogic designs. Such designs do not focus on the teacher being in control of the learner's experience (context, environment, content, timeframe, etc.). Instead, the teacher's role becomes supportive and directive, focused on the orchestration of learning and learners. One key task is to bring diverse learner experiences together for shared social learning and to synchronise the class.

To support seamless learning designs one could follow the AICHE model [20, 21]. It builds on ambient information channels that form a frame for ubiquitous learning and synchronising real-world environments. It offers a way to connect and synchronise channels, artefacts, and users in a seamless learning environment and metacognitive learning processes. Synchronisation is at the core of every contextualised learning support. Synchronised channels can be mapped against relevant reference information in the instructional design which allows most artefacts and real-world objects with which we learn to be framed in the instructional context [21]. One example of this would be the social extensions of many mobile apps and e-portfolios that allow sharing, reflection and feedback within a social learning network.

4 Good Practice of Seamless Language Learning

4.1 Seamless Language Learning with Smartphones and e-Portfolios. An Overview

At the University of Teacher Education Vienna, the approach of seamless language learning is put into practice. Various curricular stakeholders and researchers suggest that lifelong learners at tertiary level should try to overcome pre-conceptualised learning borders. This is to say that a learner should not think in terms of formal vs. informal learning [15, 22]. Therefore, the approach of interdependent, interconnected, coherent and fluid education scenarios is of great relevance especially when educating future (language) teachers. In the context of language acquisition strategies and seamless learning, the dynamic approach of lifelong learning (LLL) should be noted. When addressing autonomous, fluid and self-regulated (language) learning scenarios within a tertiary context, e-portfolios come into play [23, 24]. Taking the curricular demands of the University of Teacher Education Vienna into consideration (especially EFL modules for pre-service English teachers), 'strategy model B e-portfolios' (i.e. reflection portfolios as a teaching/learning method [23]) are implemented in the pedagogical framework of various EFL seminars. The strategy model B e-portfolio can be characterised as follows:

- e-portfolios as teaching/learning method in individual courses (general description)
- reflection/learning process portfolio (portfolio type)
- high learning motivation through inspiring learner-centred arrangements. Training of key qualifications and increase of personal competency (main benefit for students)

- analysis, application, transfer of newly learned skills; promotion of overall competencies; quality control and development in teaching (curricular/institutional goals) [23]

Several chosen groups of EFL students use their smartphones (cf. opening up instructional models, considering real life learning situations by using technologies that meet the learners' zeitgeist in an informal and formal context) and the e-portfolio platform Mahara to bridge institution-based and informal learning contexts. Students are asked to use smartphones to create episodes of situated student-centred learning, which means that the curricular input of the EFL-lectures/seminars are extended with mobile-phone-assisted learning activities. The self-determined learning spaces (= episodes of situated learning) extend the 'learning path' of the student [25]. The following short didactic scenario exemplifies the seamless language learning approach further:

Curricular Input within a Classroom Based Context. During the EFL seminar, students receive theoretical and practical instruction on how to improve their monologic speaking skills (e.g. fluently talking about a certain topic [26–28]).

Creation of Linguistic Artefacts in Transferred Settings. In dedicated sessions (e.g. school practical studies for EFL students, etc.) students learn to use smartphone apps to create audio recordings (focusing on theoretical and practical aspects, how to focus on intonation, rhythm, stress, etc.). Then they are asked to produce several artefacts which supports the self-evaluation of their linguistic production (speaking skills): they record themselves in different situations (at university, at home, etc.) talking about certain seminar-related topics (e.g. the life of an English teacher in Vienna, documenting ELT-related activities, reflecting their lesson performances, and so forth) and articulating their ideas in the L2 independent of time and space. Alternatively, they can use an Avatar recording app like Voki (www.voki.com).

Sharing/Documenting/Discussing Artefacts in an e-Portfolio. After having recorded themselves and practised the act of monologic speaking about a certain topic (remedial drill-and-practice patterns), students are asked to upload the audio file (produced with their smartphone application) to their personal e-portfolio (in Mahara). The students then invite their peers and tutors to give constructive feedback on their spoken performance (feedback on discursive strategies, lexical/grammatical accuracy, coherent logic, etc.) [24].

4.2 Empirical and Didactical Evaluation of e-Portfolios and Seamless Language Learning

In order to back up the descriptive lines of argumentation concerning the use of e-portfolios and integrated seamless language learning, some empirical data [29, 30] will be presented. In the course of a research project at the University of Teacher Education Vienna (2011-2013, "The use of e-portfolios in teacher education"; with an emphasis on self-regulated language learning), the following scientific focal points were formulated:

1. What is the general perception (positive or negative) of Mahara among pre-service teachers after 1.5 years of e-portfolio usage in the course of school practical studies/EFL seminars?
2. Which Mahara-internal and external tools are being used in a certain didactical context (including reflection, feedback sessions, learning outcomes). How often are they used?

In the second year of the research project, a questionnaire with 27 questions (multiple choice and open questions) was designed for 220 students (pilot group, lower secondary and primary school pre-service teachers). 147 questionnaires were returned (i.e. 66,8 %). Furthermore, four semi-structured interviews were carried out with students.

Since it is part of the institution's curriculum to continuously use e-portfolios for pre-service teacher training especially in school practical studies, it seemed to be legitimate to ask for a general tendency concerning the perception of e-portfolios among students. The authors of the questionnaire deliberately formulated the following question in quite a general way in order to receive a quick response concerning perceptive tendencies: "If you had the chance to decide whether to continue using Mahara or not, how would you decide? O yes O no".

From the 147 respondents 85 (i.e. 57 %) want to continue using Mahara. From the perspective of the stakeholder and the project group, this figure is quite satisfactory, since speaking from a globally-semantic point of view a general majority of the students appreciate the use of Mahara, which can be seen as a solid basis for a continued use of e-portfolios with the determined need to constantly increase these figures in the implementation phase.

Analysing the data within the empirical segment "The use of Mahara-internal and external tools" (cf. research question 2, e.g. upload of audio files, etc., see above Sect. 4.1), the following recurring pattern concerning seamless learning outcomes can be recognised (mainly based on open questions): In certain groups (e.g. 3rd semester lower secondary school teachers and 1st semester primary school teachers) it can be seen that Mahara does not only serve as a simple archive of artefacts but also as a dynamic, seamless interface for communicative and self-regulated learning [31]; cf. students' recordings of spoken artefacts including reflective performance as a part of their tasks in the EFL seminars). Within this group, 23 people indicated that Mahara's journal (internal blog tool) is frequently used for reflective processes (blogging about their personal speaking performance). 27 students indicated that several external tools (e.g. audio player plug-ins) are continuously used to display or disseminate their produced artefacts (cf. audio recordings). Within the context of the semi-structured interviews with students, many of them explicitly uttered that the use of Mahara's journal function (blogging about your spoken performance, receiving constructive feedback on their linguistic performance by peers not only professors) in combination with simple but effective audio plug-ins (e.g. embed the recorded audio file into their personal learning environment) helped them to continuously become aware of their linguistic strengths and weaknesses (pronunciation, grammar, lexical mistakes) due to constructive chunks of feedback. Especially 'inhibited' (character attribute based on self-assessment by students in the course of semi-structured interviews) students had the chance to record

their spoken performances over and over again until they believed their produced artefacts were suitable for meeting the demands of the original task (also considering in-between feedback by students and professors via the journal). Furthermore, they did not experience such a pressure as it would occur when performing their oral presentation within a formal classroom setting. Therefore, positive developments concerning certain learning outcomes (here: improvement of spoken performance) can be empirically noted. In addition, students reported that due to the fact various performative artefacts can be uploaded/edited/adapted (here: audio recordings) within an explicitly ubiquitous, dynamic and informal context (artefacts can be uploaded from almost everywhere), students can focus on their tasks/performance in familiar surroundings (e.g. at home) which often contributes to a more effective seamless learning experience.

Here, the e-portfolio does not only serve the purpose of a pure introspective self-reflection tool [32], but requires solid peer-to-peer learning (student-student, teacher-student) with a strong emphasis on seamless learning performances. The following four aspects of self- and peer-reflective learning can be noted:

- Product: Artefacts (e.g. blog posts about the student's spoken performance) can be reflected upon by their creators whether they do their job for which they were chosen. [Feedback/reflection on linguistic performance are mainly coherently uttered in a formal and informal context as one aspect of seamlessness]
- Process: The creators of e-portfolios can describe and reflect upon their methods used (e.g. new skills) and how they required them [e.g. learning diary, development of speaking skills]
- Person: The creators can document their trials or experiences that enabled them to grow and feel satisfaction or motivated them during the learning process [= seamless and immersive documentation of learning strategies in an authentic, mostly informal context]
- Problems: The learners should document their attempts to solve problems (including problem finding and problem solving) [e.g. peer feedback/error correction by students and teachers]

These aspects can possibly add 'visual evidence and historicity': [32] 'Storing and reflecting artefacts allows students to compare their efforts of several [weeks] ago with a present piece of work, so that it is possible to trace growth and development within a certain period'. [32].

Thus, e-portfolios in combination with smartphones 'will become a solid basis for social collaboration' [32] that help language learners to construct, improve, adapt and peer-review their linguistic competences within a curricular context that bridges informal and formal learning scenarios.

4.3 Benefits of Seamless Language Learning

By making students aware that the language learning designs can be considered as something fluid (formal and informal learning being coherently linked), unrestricted in space and time (ubiquitous production/reflection of learning products) and multi-sensory (using audio, video, images, etc.), they realise that learning need not be

categorised either as strictly institutional or informal. The well-designed blend of lessons, mobile technology, and artefact curation tools like e-portfolios support the language learning process to appear more holistic without the constraints of traditional lesson structures. This fluid and ubiquitous learning process using different levels of interactivity and construction of knowledge/competences helps students become more aware of the fact that they can provide peer support or practise certain linguistic patterns (here the production of grammatically, lexically and topically coherent monologic spoken texts) whenever it suits them best.

Due to the technological simplicity of several audio recording or Avatar applications [33], students are able to record and re-record themselves as often as they like (whenever and wherever) and submit their final learning product when they think it meets the curricular demands. If the students are not really satisfied with their recording, they can bring it to the physical classroom or the virtual sharing space, discuss it with peers and teachers, adapt it, improve and finalise it. Here, seamless learning means establishing a fluent local interdependence of learning outcomes. Furthermore, students are given the chance to continuously reflect on and document progress by using an e-portfolio (cf. above).

Another benefit is the inherent flexibility of the learning activities. Whenever the students have another idea on how to improve their recordings, they can immediately access it via their smartphones or e-portfolios (from home, on the move, in class) and adapt it to the needs of the momentum. Therefore, seamless learning supports the idea of immediacy as a continuous, rapid reflection process. With the support of the tutor, their peers and the use of complementary technologies, students can overcome being mere recipients of transferred knowledge, but directors of their own learning.

The seamless scenario described above can be considered as "open" or "flexible", where formal and informal learning converges (since the learners can improve or modify their audio recordings anytime anywhere). Even more importantly, in this spatial and temporal openness, the formal learning design is extended into the "real world", and, therefore, includes specific cultural codes of discursive and behavioural patterns adapted to general frameworks of society, e.g. how to give constructive feedback on their peers' audio recordings, how to critically reflect on one's own linguistic performance, etc. What is more, the learning design becomes situated as learners are challenged with developing awareness of real-life contexts (i.e. situations they encounter while developing their artefacts). Due to the fact that the learners also continuously work or reflect on their learning products (their audio production) within an *everyday life* context, the learning experience per se becomes more authentic than the one in a traditional classroom-based situation.

5 Towards Digital Immersion and Seamlessness

We'd like to come back to the original concept of enabling digital language immersion using seamless learning designs. In our short example above (i.e. a seamless learning scenario), we captured one individual element of FL learning. To achieve digital immersion using the full potential of modern learning technologies, many targeted and complementary learning designs, addressing different linguistic and cultural competences

such as comprehension, production or feedback/reflection skills need to be applied. These can be structured against expected outcomes along the lines of the Common European Framework of Reference for Languages (CEFR; [27]). Several attempts using augmented reality have already been undertaken and evaluated, including the description of requirements for a contextualised multi-platform learning framework [34].

This would in our opinion lead to the need of designing new learning spaces away from, but incorporating the classroom activities (blended designs). It requires the learning designer to think about new interfaces and the openness of the course, but, even more importantly, the expected outcomes. Learning in self-directed seamless spaces, naturally, becomes entirely outcome-oriented, due to the self-determination of the learner in organising and taking control of their own learning. While this sounds challenging in the beginning, the longer-term benefits are competent, confident lifelong learners.

What we would like to stress, however, is that immersion teaching has a firm rooting in cultural authenticity and this is often not served by language learning lessons, no matter how advanced the technology that is being used might be. Seamless scenarios developing cultural competences, therefore, should in our view become an integral part of seamless TELL. Understanding cultural concepts of a foreign language, regionalisms, dialects/accents and sociolects, therefore, need to be designed into the language learning experience and exposure of students. Designing cultural and contextual experiences for language learners can, in our opinion, lead to more comprehensive competence building, and the use of modern mobile, immersive and ambient technologies can provide the necessary connective environment to facilitate this.

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