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Technology in formal and informal learning environments: Student perspectives

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Abstract

The aim of this study is to assess whether the ease with which L2 learners/users can engage with their target languages beyond the classroom influences their perceptions of formal environments. Drawing on questionnaires, interviews and the results of the annual self-access centre (SAC) monitoring, we present data from three interlinked settings. Results indicate that despite the abundance of technology-based language learning opportunities, students still believe they benefit profoundly from the expertise and feedback of teachers and SAC advisors. We conclude by pointing out potential reciprocal influences between the individual settings of a learning environment, and advise how teachers could help students become better-informed consumers of technology-mediated learning opportunities.

Keywords: Informal language learning, interplay between settings, self-access centre, formal learning environments, student perceptions of technology.

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1. Introduction: technology's impact on informal and formal learning

It is widely accepted that successful language learning is rarely the product of classroom instruction alone, but needs to be supported by independent language use and practice (e.g., Benson, 2011a; Lai & Gong, 2015; Wong & Nunan, 2011). This has most probably always been true; what has changed is the ease with which learners, thanks to technology and the ensuing 'mobile learning revolution' (Kukulska-Hulme, Lee & Norris, 2017), can accumulate learning experiences in a multiplicity of out-of-class settings (Benson, 2011a; Chapelle & Sauro, 2017; Sylven & Sundqvist, 2017). Studies in the area of technology-mediated language learning have confirmed that informal practices – watching films and TV series, emailing, facebooking, gaming, chatting and vlogging – have become an integral part of young people's daily lives, affording plenty of opportunities for language exposure, use and, consequently, incidental and deliberate acquisition (Jarvis, 2015). While in many cases in-class and out-of-class learning play complementary roles, accounts of informal learners who have achieved a high level of proficiency without any instruction whatsoever are beginning to emerge (e.g., Cole & Vanderplank, 2016), lending support to the thesis that 'the most effective L2 learning arises from learners' sustained attempts to use the target language for their own communicative purposes' (Little, 2015, p. 5).

Technology has left its mark on educational institutions, as well. In order to remain competitive, universities develop learning management systems as well as online and blended learning courses, revamp their self-access centres (SACs) and equip classrooms with internet access and presentation technologies. At least in richer countries, technology in education is well on its way to becoming 'normalised', defined as 'the stage when the technology becomes invisible' (Bax, 2003, p. 23).

The recent move to a new campus enabled our university to finally catch up with this trend, completing, as it were, the transformation of our students' individual learning environments. This triggered interest in investigating the ramifications of these major shifts and to explore how individual settings interact. There is already a significant body of literature on digitally enhanced, instructed language learning. Similarly, in the period since, Benson (2011a) pointed out the paucity of research on language learning beyond the classroom, the 'digital wilds' (Sauro & Zourou, 2019) have attracted growing interest, manifested in the appearance of a number of edited volumes, as well as special editions of journals (e.g., CALICO, 2017; Language and Technology, 2019). Yet only very few studies (most recently, Toffoli, 2020) so far have dealt with 'out-of-class learning in its relations to classroom learning and the totality of the learning environment' (Kashiwa & Benson, 2018, p. 19). We have attempted to address this gap in the literature by exploring the reciprocal adaptations that take place between the various constituents of individual learning contexts.

1.1. Settings and (individual) learning environments

The learning and teaching landscape has become increasingly complex, defeating any attempts to categorise it according to one-dimensional dichotomies (Kukulska-Hulme et al., 2017). As Barron (2006, p. 195) suggests, nowadays language learning tends to be 'distributed over several settings and across many types of resources'. Our understanding of the terms 'learning environment' and 'setting' draws on Benson (2017, p. 136). He contends that 'languages are not learned inside or outside the classroom; they are learned in individual learners' "language learning environments"'. Learning environments are constituted by the 'settings that are within an individual's reach' (Benson, 2017, p. 141). These settings are individuated and dynamic in nature, changing according to the use they are made of over time. What is important is that 'in order for the available resources to be integrated into an individual's learning environment, its affordances must be recognised'. In the context of informal learning, this means that students may well have highly diverse and subjective views on whether an activity commonly associated with leisure develops their target language competence, and may accordingly vary their behaviours.

1.2. Informal learning

Stevens (2010, p. 12) defines formal learning as directly linked to school or university and to courses leading to qualifications. By contrast, informal learning results from 'daily life activities related to work, family or leisure' and is not structured in terms of objectives or learning support. Informal learning is furthermore characterised by being self-initiated and non-prescribed (Benson, 2011a), rather than by its location outside institutional contexts; it is, in fact, ubiquitous, facilitating learning experiences across time and space. This means that although the concept is often associated with out-of-class settings and the mediation of technology, commonplace activities such as speaking with incoming students before class would also constitute an informal learning opportunity. Research in the relatively new field has tended to focus on the affective and cognitive outcomes of online experiences such as social media communication, digital gaming or media consumption, with a growing number of empirical studies confirming positive effects on language outcomes (e.g., Lai & Gong, 2015, Lee, 2019; Lee & Dressman, 2018; Rodgers & Webb, 2011; Sockett, 2014; Sundqvist & Wikstrom, 2015).

1.3. Learning in self-access centres (SACs/SALCs)

Although their physical location – generally within the environs of educational institutions – may suggest an orientation towards more formal learning, in reality SACs can take different forms and consequently the kind of learning they support 'may range from self-directed to teacher-directed' (Pemberton, Li, Or & Pierson, 1996, p. 3). Historically, such centres – also called 'language resource centres', 'language learning centres' or 'independent language learning centres' – emerged as 'purpose-designed facilit[ies] in which learning resources are made directly available to learners' (Benson, 2011b, p. 128). Nowadays, as technology facilitates access to resources, communication and sharing of content both inside and outside the institution, many centres are pressured to undergo restructuring, reassessment and renewal (Hobbs & Dofs, 2017). In times of dwindling funding, university administrations scrutinise very closely what services and facilities are actually used by students, and SACs that fail to keep up with the times risk closing down.

However, there are SACs that despite all the technological changes have succeeded in remaining thriving centres of activity over the years (Mynard, 2012). Their success seems to be due to a combination of factors such as a sound pedagogical concept (Benson, 2011b; Gardner & Miller, 1999; Mynard, 2012), adequate staffing and funding (Gardner & Miller, 1999), good management (Gardner, 2011) and the willingness to change and evolve into thoughtfully organised language learning spaces, community of practice hubs and catalysts of innovation (Allhouse, 2014; Kronenberg, 2017). As to the innovation factor, an important trigger in this respect can be ongoing research, as suggested by Mynard (2012), who argues that '[o]ngoing action research is essential for continuous development; a centre is never "finished"'.

Furthermore, the positioning of a SAC within a learning context is also crucial to its success. In this regard, Benson (2017, p. 135) observes that 'a SAC is not a "learning environment" in and of itself. It is, instead, one among many "settings" for language learning that potentially make up the language learning environments of its users'. When designing a SAC, it is therefore essential to pay attention to how it positions itself against all the other settings that learners can potentially engage in when learning languages, and to develop its offer in such a way that it complements all of these settings (Benson, 2017).

1.4. Research questions

Students at our university participate in formal language classes have access to a multitude of resources at the university's SAC and have been shown in an earlier study to regularly make use of informal learning opportunities. In all these three settings, technologies are playing an ever more

important role. Against this background, we have aimed to find out if students' increased use of informal resources outside university influences their views of the benefits of formal settings (classroom and SAC). To be able to shed light on the totality of a learning environment, we first needed to explore students' views on the usefulness of the individual settings for language learning and of the role of technology in each setting. We were guided by the following research questions:

- *Setting 1: Informal*: Are students aware of the learning potential of technology-mediated informal resources, using them deliberately with an eye to learning? (RQ1)
- *Setting 2: Classroom:* Do students expect technology to play a major part in formal contexts? Are perceptions of best use of classroom time affected by ease of access to L2 resources beyond the classroom? (RQ2)
- *Setting 3*: *SAC*: Have students' expectations and reactions changed over time? What motivates students to visit? (RQ3)

2. Method (Settings 1 and 2)

2.1. Sample and data collection instruments (RQ1 and RQ2)

The participants (*n* = 96) are non-specialist students of English (i.e., students of International Business Administration) of an intermediate to advanced level and were recruited from researchers' own classes, thus constituting a convenience sample.

An open-ended questionnaire consisting of two parts was employed. Part one enquired into preferred informal resources, frequency of use, perceived usefulness (or not) in terms of skills development, deliberate employment for learning and any changes in preferences over the past 5 years. Rather than providing a list of technologies, we asked respondents to name the resources they used most extensively for viewing, listening, writing, reading and communicating (providing a guesstimate of the hours/minutes per week), and to nominate the resource they found most useful in each category. Part two focused on participants' views on 'the best way of learning a language', the role of formal instruction as well as (teachers') instructional technology use.

In order to substantiate the questionnaire data and provide a richer image of students' experiences and views, we conducted focus group discussions with all participants. To that end, participants were divided into groups of four to six. Questionnaire and interview data were then subjected to qualitative content analysis. Students' responses were analysed in terms of what they revealed about their perspectives on the relative strengths and weaknesses of each setting, and their reasons for using individual resources.

3. Findings

3.1. Setting 1: informal

In terms of prevalent activities, students' preferences have hardly changed compared to a previous study amongst the same population, and also largely reflect the findings of surveys conducted among university students in France (Toffoli & Sockett, 2010) and Germany (Kusyk, 2017). Table 1 details the most important technology/activity for each skill, the maximum and minimum time students spend interacting with it, and the percentage of respondents who consider it useful for language learning.

- Listening: Watching TV shows is the number one informal activity in terms of extensive use as well as ratings of learning benefits. By contrast, listening to music is a popular activity, but regarded by the majority as offering little learning potential.
- Speaking: Few students regularly use online settings and mobile apps for speaking in English. Those who do speak primarily in work contexts (video conferencing) or interactively on pre-

arranged occasions (WhatsApp, Skype), which they then find useful for developing language skills.

- Reading: Students spend more time reading online in receptive mode (articles, news sites). Interactive reading (social media, communication apps) is an activity students perform regularly, but usually in short bursts. Email has lost in importance, and is often associated with official contexts (work, university) rather than private communication. The majority credits receptive reading with language benefits.
- Writing: Little extensive writing is done in informal contexts. Students frequently exchange quick messages on WhatsApp and comment on social media posts but only writing emails is believed to contribute to language development.

Table 1. Use of technological resources

Skill	Most popular activity/ technology	Useful for language learning	Average time spent on activity (maximum)	Average time spent on activity (minimum)	Done deliberately in target language (language learning as side effect)
Listening	Viewing TV series	Yes (90%)	1–2 hours/day (54%)	2–4 hours/week (10%)	Yes (85%)
Speaking	Video chat, video conferencing (e.g., Skype, Zoom)	Yes (70%)	2–4 hours/week (14%)	None (40%)	Yes (16%)
Reading	Online articles, news	Yes (85%)	1–2 hours/day (48%)	1–2 hours/week (12%)	Yes (72%)
Writing	WhatsApp	Yes (15%)	1–2 hours/week (68%)	30 minutes/week (12%)	Yes (8%)

3.1.1. Focus on viewing and communicating

A – Viewing

Streaming of films/show in the original version has become a commonplace leisure time activity, particularly amongst this age group and in English (Rodgers & Webb, 2017; Toffoli & Sockett, 2010; Author XXX). The amount of time expended on watching is considerable: more than 50% of respondents estimate 1–2 hours per day, with TV series, YouTube and movies the firm favourites. The minimum viewing time, cited by just 10%, is 2–4 hours per week. 85% claim to watch the original version also because of the positive side effects on language outcomes. In particular, vocabulary gains and getting used to fast speech and different accents are cited. These comments encapsulate students' reasoning:

- 'If you watch a film in a foreign language it is not annoying or exhausting. You do not have the feeling that you are learning but it helps a lot to improve your English skills'.
- 'Yes I do [deliberately watch in English], because then I don't feel so bad for watching more Netflix than I probably should, because of the learning benefits'.

B – Communicating: Social media versus face-to-face

WhatsApp and social media are the prevalent channels of communication, followed by face-to-face communication. However, WhatsApp is credited by many respondents with low learning potential. This is mainly due to two factors: the nature of mobile communication dictates that speed goes before accuracy and that habitually only little effort is expended on composing or interpreting the short chat statements. Many students discount it because of its repetitive nature: 'WhatsApp is always the same, you don't' learn from it'. Unlike speech, messaging lacks the linguistic challenges of interacting in real time. This comment captures the general attitude:

- 'WhatsApp is useful for quick messages or groups, but I prefer face-to-face. If you are speaking face-to-face you haven't a long time to think what and how you answer. You need to be flexible and access your own vocab reservoir.'

Comparing video chat to face-to-face conversation, it transpires that the proliferations of the new communication tools has little bearing on students' behaviours and preferences. Although video chat offers similar parameters to face-to-face, it is seen as second best, with only 15% finding it a valid substitute. Those students who count video calls among their three most frequently used communication resources use it primarily for work. Asked to elaborate why they use it so little, students typically explain that their lives offer many opportunities for speaking English – on campus with international students, in English-medium instruction classes, in pubs, on their travels – which their extrovert nature allows them to benefit from, and which align with their ideas of 'best way of learning'. It is only a minority that later keep in contact with these new friends by voice or video calls.

3.2. Setting: classroom

As mentioned previously, the university's relocation was an opportunity to have classrooms equipped with internet and multimedia presentation technologies, including computer monitors, Whiteboards and/or Smartboards. We were interested in how students rated the use of instructional technology, and whether their expectations of classes had changed at all due to their own easy access to TL input and communication opportunities. This section draws on part two of the questionnaire (student perspectives on the role of formal instruction), supplemented again by focus group discussions as outlined in RQ1.

Concerning the use of technology in class, students' reactions were positive but not enthusiastic; for them, high-tech is simply the norm. The tenet is that technology can provide fun and variety (e.g., films clips and game-based learning quizzes like *Kahoot*!) as well as structure and convenience (posting of teachers' slides on learning platform), but that it is more important for classes to offer opportunities for output and form-focused activities. As one student puts it:

- 'Technology yes but not too much. Speaking, writing and getting feedback on how to improve can't be replaced by *Kahoot*'.

Although the majority of students (65%) find that the integration of authentic film or news content makes a welcome change, 12% would prefer to have viewing activities outsourced to out-of-class environments to make place for that type of learning that cannot easily be catered for by informal resources. However, this only applies to English. Students have fewer opportunities for informal encounters with other target languages, and often do not have the required level for following films on their own. In these languages, structured viewing activities with teacher guidance are welcome. Conversely, in English students have so much exposure to informal audiovisual resources that their listening skills have greatly improved – and they look down on any scripted, dedicated listening/viewing exercises, dismissing them as 'too easy' or 'boring'. It is speaking they are keen on practising in face-to-face settings, be they formal or informal.

Regarding technology type, participants favour applications that not only provide variety, but either help to actively involve them or even test them via their mobile phones – *Kahoot*! or *Quizzes* being prime examples. These game-based testing platforms offer something they do not get in informal settings: points, rankings and thus measurable feedback on how well they are doing compared to their peers.

In fact, the chance of benefitting from feedback and error correction – accuracy is considered important, at least in formal and business contexts – is perceived as one of the main advantages classroom settings have over informal learning. 92% of the students say they could not have reached their current level of English without classes. The most frequently cited benefit of classes – after

'teaching the basics of a language' – is getting feedback on individual performance, and thus providing a more efficient route to success.

To sum up, up to a point, students' expectations of classes appear to have been changed by their easy access to language input. The data suggest that students use and rate English-language media predominantly in a receptive rather than interactive fashion, and that they expect classes to redress this imbalance. What students want from teachers is basically what they find difficult to get from informal resources, be they material/technology-mediated or social. Although their needs are shaped by a host of individual factors such as proficiency level, personality traits and aptitude components, there are some recurring suggestions about how teachers can make sure that classrooms complement informal settings: by providing information on metacognitive skills, feedback, explicit corrections, opportunities for output (written and spoken, formal and informal registers) and formal/form-focused practice opportunities.

3.3. Setting: self-access centre

When planning the SAC for the new campus, we were faced with the great uncertainty of whether this facility would still attract visitors and be worth the investment. After all, the future, role and very existence of SACs had already started to be questioned at the time of planning (Reinders, 2012). Moreover, not only online technologies, but also other learning environments on campus were potential competition to the SAC.

However, in retrospect these challenges, far from being fatal to the SAC, represented an incentive to develop an added value for the new SAC, and indirectly helped establish it as a setting where students can find something that is not available elsewhere. The decision to place the SAC within the central library complex proved to be a strategically favourable decision, as it contributed to the visibility of the SAC. In fact, the move to the new campus was a very positive turning point, in that it enabled a consolidation of its institutional status within the university and an increase in the number of visitors. In the following section, we attempt to explain what else contributed to this positive outcome.

A factor that proved to be very useful in ensuring that SAC affordances were up-to-date was the systematic evaluation of its services through different data collection tools, specifically the annual monitoring survey outlined below. This survey makes it possible to monitor changes in perceptions and attitudes towards the structure and services offered. Moreover, it provides data about efficiency and effectiveness of the centre, which is an important basis for negotiating funding with senior management of the institution (Gardner, 2011).

3.3.1. Method SAC: sample and data collection instrument

The annual monitoring survey is one of the tools used at the Language Learning Centre to capture developing trends and to be able to react appropriately to changing user needs. Every year, over a 4-week period between mid-November and mid-December, an anonymous paper-based questionnaire is administered in two versions (German and English) to visitors of the SAC. Participation is voluntary and anonymous. The questionnaire was first introduced in 2003 in an embryonic form with the aim of assessing and detecting changes in user behaviour, user frequency and student satisfaction with the facilities and services offered. It has become more complex over the years, integrating both closed and open-ended questions. By way of example, the following section describes some of the most significant results of the monitoring survey carried out between mid-November and mid-December 2017.

The sample consisted of 120 participants. 50% were under 24 and more than 75% under 27 years of age. 38% studied International Business Administration – a course of study where a second foreign language is compulsory – and 31% Business Administration, where only one foreign language is mandatory. 81% were enrolled in a bachelor programme, 12 in a master programme. The remainder

were exchange students and students from other universities. 23% of the respondents had already taken part in a tandem programme.

3.3.2. Results (SAC)

One of the items in the questionnaire aims to find out how students first learn about the SAC. Respondents to the survey first learned about its existence mostly from fellow students (48%) and from the university homepage (17%), followed by teachers during their language courses (8%), brochures (8%), during one of the orientation tutorials organised by the student union (6%), and from Infoscreens placed in the auditorium (5%). Following the results of the survey which indicate that only a small percentage of students had been informed about the offer of SAC by their teachers in their courses, action was taken in order to increase the flow of information towards the teaching staff.

In terms of materials and resources, the results of this survey show that respondents made frequent use in particular of the following tools: online dictionaries, movies (with and without subtitles), podcasts and online videos, textbooks with CD/DVDs, materials for the preparation of certifications such as TOEFL and lastly, the university e-learning platform. The frequent use of materials that are easily accessible on the Internet in students' private spaces suggested the introduction of an additional item to the questionnaire, namely: 'What motivated you to come to the SAC to use online resources that are accessible on the Internet?'. Originally this question had been part of a semi-structured interview that was carried out in the SAC for a qualitative study, and the answers were later integrated in the questionnaire for the respondents to choose from. The results of the monitoring survey 2017/18 indicate that the main motivation for using materials readily available on the Internet in the SAC is that students find it 'easier to concentrate/are more focused' (60%) in that setting. This is followed by the availability of accompanying materials (56%) and the equipment and comfort of the Language Learning Centre (42%). Compared to the monitoring survey from the year before, the motivation provided by learning among other language learners (26%) gained in importance (7% increase), whilst the appreciation of equipment and comfort (22% decrease) as well as the use of time between two classes (15% decrease) lost in importance (see Fig 1).

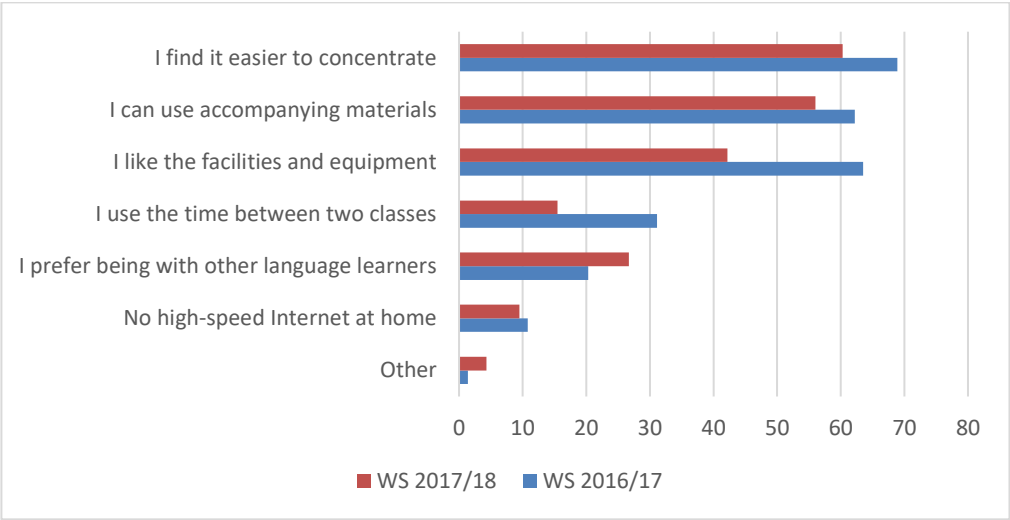

Figure 2. Reasons for using the SAC

3.3.3. SAC – the added value

As mentioned earlier, an important factor in attracting more visitors was certainly the decision to place the SAC within the Library and Learning Centre where all student services are concentrated, including the main library and several computer rooms. However, this alone cannot explain the positive response from the students.

Another important precondition for a successful outcome was undoubtedly the fact that the centre is well funded by a sponsor, allowing time and energy to be invested in the development of new projects. One of these projects was the introduction in 2015 of a tandem as a free elective programme for which students can obtain credits. The SAC has been offering a tandem programme since 2002, yet by granting ECTS-credits for an informal learning activity, the university officially recognised the value not only of the learning activity itself, but also of the pedagogical input provided by the SAC. Even though the SAC has a language advising service, through this new module it has been possible to provide systematic support and assistance to students in their needs analysis, goal setting, and decision-making about what and how to learn.

These metacognitive skills play a significant role, especially in non-formal and informal learning contexts, as emphasised by Hobbs and Dofs (2017, p. 97): '[w]ith the increasing move towards blended, online learning, and distance learning evident in institutions today, there may also be an increasing need for enabling learners learn how to learn, and to increase their metacognitive awareness, including how to plan and monitor their learning. Paradoxically, while going virtual, non-virtual skills may be more necessary'.

4. Discussion: interplay between settings and individual learner attributes

In this study, we have reported on student views on the language learning potential of three settings, which ideally work together in a complementary manner to form individual healthy environments. Our data indicates that technological (but also social) resources constitute a major source of learning beyond the confines of the classroom, and suggest that use of such resources can have cognitive as well as affective outcomes for learners: language development and enhanced confidence and enjoyment. These outcomes, we argue, in turn shape students' expectations of classroom practice as well as of the offerings of the SAC.

Clearly, no two learner pathways or even environments are ever identical. There is diversity in learner conceptions and actions due to individual differences as multi-faceted as self-concept or as straightforward as leisure time inclinations. Still, certain trends in students' handling of independent learning opportunities are discernible that directly affect instructed contexts. For instance, our findings confirm that, in line with studies on informal learning in other geographical contexts, our sample shares a preference for media consumption in the form of film and TV series viewing. The affordances of this resource engender (in many cases) noticeably improved listening skills. The consequences for the classroom are twofold: first, the role of teacher as the sole provider of authentic aural input is already history. Second, and at least in the case of English, students are quick to find any scripted audio/video teaching materials 'artificial' and not challenging enough. Thus if teachers want to use classroom time profitably, they not only need to select most carefully what kind of listening/viewing to integrate, but also to decide whether such activities might not be better outsourced to settings beyond the classroom.

Trends are less clear-cut in other areas of the informal realm, in particular when it comes to productive skills. Our data suggest that although participants vary in their use and perceptions of the affordances of computer/mobile-assisted communication, they agree on the superiority of face-to-face over online/mobile communication. Not all students, although, find it easy to locate opportunities for face-to-face interaction; we believe that procuring social resources, in particular interlocutors, may be positively associated with individual attributes such as extroversion, and facilitated by the affordances of contextual parameters at university (e.g., English-taught modules) or at home (e.g., rooming with international students).

Given the fact that speaking is the skill least catered for by new technologies, there is strong demand for teacher-provided opportunities to communicate, interact, and voice opinions – and demand for direct feedback and corrections, which students perceive as an efficient way of improving accuracy. Accuracy is considered a sine-qua-non for being successful in international business, and

students understand it as one of the main responsibilities of teachers to help them achieve it, particularly as feedback is something they explicitly miss in informal environments.

While the above illustrates the potential implications of students' informal and online learning activities for classroom teaching, the influence, as noted previously, need and should not be unidirectional. Students may well be digital experts and familiar with the latest technological tools, but not all of them know how to exploit the affordances of informal experiences to best effect. In the course of our interviews, we heard about teachers who discussed in class how to use monolingual dictionaries or thesauri, suggested websites and podcasts that would help with more specialised business vocabulary, or indicated the relative advantages and disadvantages of subtitles with films. In general, allocating classroom time to discussions and sharing of informal online practices by focusing on the implicit secondary aim – practice and development of language skills – may be a worthwhile approach to enhancing the quality of informal learning experiences.

SACs can also play an important role in raising students' awareness about the potential of leisure activities for L2 language development. As Toffoli (2020, p. 178) points out, SACs which aim at assisting students in developing strategies, methods and behaviours to ensure continuous learning outside the classroom can serve as an important gateway to lifelong learning. This can be carried out, for example, through the qualified input of language advisors within structured tandem language learning programmes or supervised self-directed language learning projects.

5. Conclusion

The findings of this study indicate that students and teachers operate in dynamic, complex and interdependent learning environments which they utilise according to unique configurations of requirements, preferences and abilities. Neither overusing technology in class nor discounting its prominence in students' private realities addresses the challenge of learning environments in a state of flux. Instead, building bridges between spaces by focusing on how students can profit most from independent learning opportunities – helping them acquire the necessary 'non-virtual' metacognitive skills and strategies referred to by Hobbs and Dofs (2017) in the context of self-access learning – might be a fruitful way forward.

We argue that teachers need to become aware of the fact that some requirements, preferences and abilities of students have changed through advances in technology while others remain virtually unaffected. Of course it is not the teacher's or the institution's responsibility to fine-tune the configurations of individual students' learning environments, but adapting their classroom practice or their SACs in such a way as to best fill the gaps left by the global realities of technology use can be considered well within their professional remits. We believe that finding out about students' online and out-of-class learning practices is a crucial step towards identifying unmet needs, and focusing on unmet needs is a perfect means of enhancing the relevance of formal settings – classrooms as well as SACs – in a changing digital world.

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