



Nordic Journal of Digital Literacy,
volume 11, no 3-2016 p. 165-184
ISSN online: 1891-943X

DOI: 10.18261/issn.1891-943x-
2016-03-03

PEER REVIEWED ARTICLE

In or Out of School?

*Meaningful Output with Digital and Non-digital Artefacts
within Personal English Learning Ecologies*

Michel Cabot

Assistant Professor, English Department, Stord/Haugesund University College (SHUC),
Norway
michel.cabot@hsh.no

ABSTRACT

This paper integrates ecological perspectives with language development theories to elucidate students' self-perceived learning trajectories. It presents data from focus, in-depth and member checking interviews with three boys and three girls. The findings show low English as a foreign language (EFL) written output and improved oral output in school (girls) and outside school (boys). It is of particular interest to describe which digital and non-digital experiences students regard as ecological transitions, and to what extent schooling is complementary and compensatory.

Keywords

Personal English learning ecologies (PELE), EFL output, agency, EFL out-of-school learning

INTRODUCTION

Countless adolescents spend several hours a day in front of a computer both in and out of school (Hatlevik et al., 2013) and use technologies for the development of their speaking and writing skills in English (Rasmussen et al., 2014). Norway and Sweden are compared to other countries in a unique position to profit from the students' out-of-school English learning (Sundqvist, 2009), since there is extensive computer use and free access to Internet at upper secondary school (Hatlevik et al., 2009; Vaage, 2014, p. 59ff).

Erstad (2013) recently discussed the importance of 'learning lives'¹—a term that has a lot in common with learning ecologies. Barron (2006) defined learning ecologies as 'the set of contexts found in physical or virtual spaces that provide opportunities for learning' (p. 195). Learning ecologies are built up to learn English, intentionally or unintentionally, and teachers of English as a Foreign Language (EFL) and researchers do not know enough about it (Barron, 2006; Van Lier, 2004).

1. According to Erstad (2013), a learning life approach is 'drawing on developments within different fields of research, in the way it tries to understand the complex issues around how young people experience learning across time and space and as a part of their everyday practices' (p. 14).


UNIVERSITETSFORLAGET

 idunn.no
Nordiske tidsskrifter på nett

The purpose of this study was to analyse opportunities for English learning through meaningful output in and out of school. Future possibilities for bridging in-school and out-of-school learning (Eshach, 2007) are not addressed in this article, as the mapping of digital and non-digital artefacts output remains a challenge for researchers (Blikstad-Balas, 2012). This study contributed modestly to the research project ‘Learning in the 21st century’ at Stord/Haugesund University College (SHUC), funded by the Norwegian Council of Research. Placed within a socio-cultural theoretical framework, this research integrates ecological perspectives with language development theories.

A Review of Existing Research

Many studies have explored EFL output in school. Ellis and He (1999) studied the effects of modified output on vocabulary. Van Lier (1997) studied language learners’ interactions and language use at and around computers in school, but his ecological approach mostly concerned both EFL input and output.

Few studies have specifically explored EFL output including out-of-school learning. Some exceptions are Sundqvist and Sylvén (2014), Sylvén and Sundqvist (2012), Sundqvist (2009), Pearson (2004), Sylvén (2004), Shehadeh (1999) and Pickard (1996). However, the problem is that some of these studies are either out of date as they preceded the digital uprising (Pickard, 1996; Shehadeh, 1999) or they did not assess both writing and speaking skills (Sylvén, 2004; Sundkvist, 2009). Sylvén (2004, p. 220) and Sundkvist (2009, p. 195) focused solely on speaking. Sundkvist (2009) found that extramural English (EE) activities ‘which demand more active participation on the part of the learner (video games, the Internet, reading) are more beneficial to L2 acquisition than EE activities where learners usually remain fairly passive (music, TV, film)’ (p. 205).

Furthermore, gender-based research on EFL output is surprisingly limited. According to Sundqvist (2009, p. 195), boys seem to be more sensitive to EE learning than girls. This is supported by other research studies, such as Uuskoski (2011, p. 48) and Willoughby (2008). Uuskoski (2011) found a strong relationship between boys engaging in computer-related EE activities and higher grades in EFL. Willoughby assessed 803 male and 788 female adolescents in a longitudinal study on Internet and computer game use at 9th/10th grade and 11th/12th grade. The results of this study revealed that more boys (80.3%) than girls (28.8%) reported gaming in both time periods.

ECOLOGICAL TRANSITIONS IN PERSONAL ENGLISH LEARNING ECOLOGIES

When a student learns English, he ‘creates’ his own learning ecology with certain ecological transitions. In contrast to the approaches of Dabbagh and Kitsantas (2012), Dalsgaard (2011) and Martindale and Dowdy (2010) who

discussed personal learning environments (PLE) or personal learning networks (PLN), the term personal English learning ecology (PELE) is used in the present paper to describe this phenomenon.

According to Bronfenbrenner (1979), ‘an ecological transition occurs whenever a person’s position in the ecological environment is altered as the result of change in role, setting, or both’ (p. 26). He used this term for some crucial moments of a learner’s trajectory, shifting his attention from one environment to another. Erstad (2014) uses notions such as ‘learner in motion’ (p. 9) to describe this phenomenon.

The level of participation within learning ecologies was of particular interest in this study because it helped us conduct an in-depth analysis of ecological transitions and separate the essential moments from the less essential ones. Theories on agency can be used to analyse such active participation. Agency is a multifaceted term. Greeno (2006) defines agency as ‘learning to act authoritatively and accountably’, like in some acts of moral courage, such as Rosa Parks who ‘refused to move farther back in a bus’ (p. 538). According to Kumpulainen et al. (2010), ‘the will to act, to experience and to exist’ or ‘an identity that has been formed through participation’ is called agency (p. 23). Pickering (1995) discussed conceptual agency in the context of Internet users treating the concepts, methods and information of the domain as resources and adapting or modifying the domain. Van Lier (2010) defined agency as ‘movement, a change of state or direction, or even a lack of movement where movement is expected’ (p. 4).

Emirbayer and Mische (1998) used temporal-relational contexts of agency in their so called ‘chordal triad’ (the *iterative* past, the *practical-evaluative* present and the *projective* future) (p. 970). In contrast to this approach, Biesta and Tedder (2006) called for a more ecological understanding, where ‘people can only achieve agency in transaction with a particular situation’ (p. 19).

Researchers either adopt a more structure-related (e.g. Biesta & Tedder, 2006) or agent-related approach to agency (e.g. Emirbayer & Mische, 1998; Greeno, 2006). The present study used both approaches to illustrate the importance of transactions between an agent and his learning ecology. Considering the plethora of digital and non-digital artefacts, the definitions of agency seemed useful for analysing possible links between the use of artefacts and the occurrence of really important ecological transitions. This study posited agentic moments as a particular subgroup of ecological transitions with a high level of participation. All ecological transitions—that is, agentic and less agentic moments—can be analysed from a language development perspective where questions are asked on whether these meaningful output situations played an important role in the interviewees’ language development.

MEANINGFUL OUTPUT IN EFL AND LANGUAGE DEVELOPMENT THEORIES

Notions such as output and input or productive and receptive skills are preferred to the term ‘literacy’ in this paper. To improve their EFL teaching, teachers must specifically ask themselves how many and which skills are stimulated in their lessons. The term ‘literacy’ seems to be an umbrella term covering all four skills (speaking, writing, listening and reading) and makes an in depth-analysis at the micro-level more difficult.

According to Selinker (1972) and Corder (1982), the development of interlanguage presupposes communicative needs. If the learner experiences no needs, he will not learn English. The aim of this study was not to describe the latent structures of an interlanguage but to determine whether and how meaningfulness and experienced communicative needs could be beneficial for the interviewees’ interlanguage. Meaningful output means a situation in which a communicative need is satisfied.

Language production provides the opportunity for meaningful practice. Swain (1985, 1993, 1995) distinguishes three functions of output: (1) noticing function, (2) testing and hypothesis formulation and (3) metalinguistic function. In the first function, English learners might encounter linguistic problems leading them to notice what they do not know or know only partially. In the second function of output, English learners are liable to test out new words or structures. Pica et al. (1989) found that transactional moves, such as clarification and confirmation requests, lead to postmodified output in over one-third of the learners’ utterances, which contributes to second language acquisition. The third function of output refers to a reflective or cognitive process—that is, a negotiation over form, not only meaning, which might occur in collaborative dialogues.

From our point of view, the two research areas—learning ecologies on the one hand and language development theories in EFL on the other hand—seem to exist separately. The present study aimed to integrate more closely these two strands of theories and to contribute to a sharper research focus on possible links between meaningful output and digital and non-digital artefacts used within students’ PELE in and outside of school. Van Lier (1997, 2004, 2010) successfully integrated ecological and linguistic perspectives, but his research did not center on out-of-school learning ecologies.

The main aim of the present study was to map learning ecologies and conduct a gender-based in-depth analysis of meaningful output. It is a sub-study of a three-dimensional study investigating the three following domains: (1) technology (digital vs non-digital artefacts, types of artefacts [Selwyn, 2008, p. 9] and agentic triggers [Gibson, 1979; Salomon & Perkins, 2005, p. 84]); (2) pedagogy (asymmetrical and symmetrical interactions within zones of proximal development [Cowie & van der Aalsvort, 2000; Fernández, Wegerif, Mercer,

& Drummond, 2001; Littleton & Light, 1999; Vygotsky, 1978, 1986); and (3) content (the output hypothesis [Swain, 1985, 1993, 1995]).²

This study only considered the above-mentioned third domain, the content framework. The content itself was not interesting; what mattered was how the students acquired new content knowledge and, in particular, to what extent the chosen learning ecologies enabled the students to progress in their development of productive skills.

The main research question was as follows: What role does meaningful output play in male and female students' self-perceived PELE in the past, present and future? To answer this question, the study addressed the two following sub-questions: Which artefacts are used to develop writing and speaking? Is speaking or writing predominant in or out of school?

DESIGN AND METHODS

Interviewees and Ethical Considerations

Following a qualitative approach, three female and three male first grade students attending an upper secondary school in Western Norway were interviewed. One group interview, 6 in-depth interviews approximately 45 minutes in duration and 6 short interviews lasting approximately 15 minutes were carried out. Pseudonyms were used to guarantee the interviewees' anonymity (Ken, Ned and Tim for the boys and Claire, Faith and Grace for the girls).

Semi-structured Interview Guide

The interviews had a semi-structured format. The interview guide comprised questions which could be regrouped into two different approaches: (1) in-school, out-of-school and semiformal learning and (2) written versus oral productive skills. These approaches were analysed in different temporal dimensions: English learning in the past, present and future. Some open questions were used several times in the first, the second and especially the third phase of the study. The semi-structured interviews enabled the iterative and systematic gathering of data from an emic perspective (Galletta, 2013; Kvale & Brinkmann, 2009; Wengraf 2001).

Phases of the Study and Interviews

Three different phases were distinguished: The first phase consisted of *explorative* focus-group interviews allowing all interviewees to talk freely. The main focus was on *where* the interviewees had learnt English (in or out of school; cf. second research sub-question). Assuming that beliefs are socially constructed,

2. These three research areas were derived from Mishra and Koehler's (2008) Technological Pedagogical Content Knowledge (TPACK) framework.

focus-group interviews were advisable because the students could ‘listen to others’ opinions and understandings in forming their own’ (Marshall & Rossman, 2011, p. 149). In the second phase, more *analytical* in-depth interviews were carried out, providing the opportunity for the individual interviewees to talk more specifically about *how* and *why* they had used all digital and non-digital contexts to improve their English. We were highly commended for using face-to-face (FtF) interviews to gain insight into the interviewees’ PELE and get detailed answers to our research questions, especially to our first research sub-question aimed at mapping artefacts used to develop writing and speaking skills (Nagy Hesse-Biber & Leavy, 2011, p. 95). In the third and *conclusive* phase, shorter in-depth interviews were carried out with the same interviewees six months later. The purpose of these interviews was to confirm findings and add some missing information (Carlson, 2010, 1105; Stanley, 2015, 31). Illustrations of their own learning trajectories and radiographic representations of their learning ecologies were presented to all interviewees. The latter representations (cf. Figures 1 and 2) were similar to an X-ray photo, which gave the interviewees a straightforward summary of their ecological transitions and agentic moments on one learning trajectory viewed in a temporal and locational perspective.

Analysis

We used different coding procedures to analyse the data material, especially open and axial coding (Corbin & Strauss, 2015). The codes ‘ICT-related’ and ‘non-ICT related’ were open or descriptive because they objectively summarised the findings without explaining or interpreting the data. Open coding was used more in the first explorative phase of the study (the focus interviews), whilst coding became more axial, explanatory and interpretative in the second analytical phase (FtF interviews) and the third conclusive phase (member checking). The code ‘interactionally modified output’ was used, for example, to explain more precisely certain output situations. Explanatory coding is used to explain, and not only describe, certain findings, and interpretative coding shows the researcher’s interpretation based on the transcriptions. The codes ‘agency’ or ‘ecological transitions’ were our interpretation of the second analytical and the third conclusive phase of the study. This was especially the case when ecological transitions were ‘clustered’ (Marshall & Rossman, 2011, p. 215), that is, compared to other ecological transitions and highlighted in red as agentic moments in our radiographic illustrations of the learning ecologies (cf. Figures 1 and 2). Thus, the third conclusive phase (member checking) was crucial because we discussed the importance of ecological transitions with the interviewees, which helped us classify them into more or less agentic moments.

SELF-PERCEIVED MEANINGFUL OUTPUT WITH DIGITAL AND NON-DIGITAL ARTEFACTS

Regarding the first sub-question, the male and female students reported in the FtF interviews on different non-digital and digital artefacts which were used to produce meaningful written and oral output in English.

Claire's English teacher used non-digital artefacts, such as songs. Claire specifically remembered having to sing the song 'Bloody Sunday' in English class. Tim remembered having to sing 'Time of Your Life' in English class. When asked to reflect on how songs were used in English class, Ned answered:

Sometimes, the teacher would ask us to sing a song in English. I got once the text from my teacher, but I ignored it. The teacher asked me why I did not read the lyrics at the same time. He was completely amazed that I could sing the whole song by heart without any mispronunciation.

Interesting artefacts used much more often in elementary school than in secondary school are vocabulary tests, which all female students mentioned several times. When required to reflect on the particular reasons for remembering vocabulary tests, Faith commented thus:

Interviewer: Why do you remember vocabulary tests? Wasn't it sometimes awful to have vocabulary tests at school?

Faith: Precisely. That is why I remember them best... Because when we finally managed to do well and to get them all right, we were incredibly proud. It gave us a real sense of accomplishment.

Ken and Ned mentioned grammar exercises as non-digital artefacts which were somehow decisive for their language development. Ned remembered a grammar exercise on the indefinite articles *a* and *an*, which he had to do at home with help from his mother. Ken even remembered a grammar lesson where the students had to conjugate the verb *to be* on the blackboard.

All interviewees mentioned past learning situations in which digital artefacts were not involved. Ned pinpointed the development of oral output in the following example:

When I was nine years old and I was bored in Spain, my mother wanted me to ask my cousin whether she would fancy watching the waves in the sea. And I did not remember how to say 'waves' in English. 'Do you want to come down and watch the __?' 'The what', she asked. And I had to draw a wave with my hand. 'The waves?' she asked. 'Yes, the waves', I answered.

Faith also qualified mainly non-digitally process-oriented writing (her teacher wrote his comments with a pen on printed essays composed in Word) as ben-

eficial for her English learning, and she hoped that her English teacher would use the same method in the future.

In sum, the study revealed several non-digital artefacts, such as grammar exercises remembered by the boys and vocabulary tests which gave the girls a real sense of accomplishment.

Regarding digital artefacts, real-strategy games, such as Minecraft, Call of Duty or League of Legends, were now used by the male interviewees to produce English oral output. The girls used social media such as Facebook and Instagram, often, but their use of written English was restricted to hashtags on Instagram and the Facebook group created by their English teacher. In this group, all the members had to ask and answer questions in English. In addition to Facebook and Instagram, Faith was the only girl who used Twitter, where all hashtags were in English. She gave us the following reasons for using Instagram and Twitter:

It has become a new trend. You get more responses on Instagram because only the pictures are important. On Facebook, there are too many other things. (...) Actually, I often get answers in English. Now, even on Twitter.

All interviewees used Itslearning (ITL) for handing in most homework. Faith wanted to use ITL for process-oriented writing in the future. The male students emphasised the learning output from Kahoot quizzes played in class every Friday when they had to discuss the right answers in groups. They believed that using this digital artefact will lead to a future learning outcome. Ned was the only student to use expressive artefacts, such as writing a wiki or commenting on a blog. All three boys told us in the FtF interviews and in the short interviews six months later that they were mostly influenced by playful artefacts outside of school and that they wanted to use them in the future (e.g. League of Legends, Call of Duty). Ken reported and confirmed in the member check interview that using a specific gaming site made him improve his oral English considerably. He noted the following:

It was something that just happened when I suddenly felt that I want to become a better gamer now ... And so I was ... It was the site major-gaming.com³. Suddenly, my English improved considerably.

Ned remembered having played League of Legends for the first time. He was at level one and his friend Matthias, who spoke better English than him, was at the highest level. When they started playing in a gaming community, they were placed with people at a level between him and Matthias. Ned often had difficulties making himself understood, and the other gamers told him that he was a poor player and should stop playing. Ned confirmed in the member

3. The domain is now for sale, but was used by the interviewee in the past.

check interview that the stress provoked by these negative comments pushed him to improve his oral English.

Often, the interviewees linked improving oral skills to the occurrence of communication problems, which were prior to a real sense of accomplishment and learning. All male students had experienced communication problems out of school. Ken said that he had learnt a lot when he had problems making himself understood while gaming. When required to reflect on communication problems, he commented as follows:

Some communication problems occurred... Just because... I have mostly learnt American English. When they speak, they understand British English better... And in addition to that, there are many words which are completely different, and you do not understand them at all... Then it becomes odd sometimes when we talk about two completely different things.

The findings related to the first sub-question of this study indicate that learning ecologies were created in the past with digital (e.g. Facebook, Instagram, Twitter, Call of Duty, League of Legends, Minecraft) and non-digital (e.g. vocabulary tests, blackboard, homework) artefacts, whilst the present and the future are or will predominantly be influenced by digital artefacts (e.g. Kahoot quizzes in groups, ITL, Facebook, Instagram, Twitter, Call of Duty, League of Legends).

SELF-PERCEIVED MEANINGFUL OUTPUT IN AND OUT OF SCHOOL

Concerning the second sub-question, all interviewees stated that writing was mostly initiated by the teacher and was going to be predominant in school. Grace and Faith developed some writing skills outside of school using hashtags on Instagram. Further, in the Facebook group created by their English teacher, all students wrote English in semiformal and out-of-school contexts. Ken could not remember having written e-mails to his friends. In out-of-school contexts, he only remembered the following situation:

The only thing I remember was that I had to send ... I don't remember exactly ... I had to send... I think, I lost my password or username and I had to send a mail in English to get a new one... to ask and regain access to my gaming community.

Ned sometimes wrote e-mails to his British grandfather. He gave us the following reasons for the predominance of written skills in school:

I think written skills are developed mostly at school because it is too difficult at home. At school, we have to hand in essays to the teacher. He can evaluate your text and you can get a 'well done'.

Written skills were predominant in school and in semiformal contexts because there was a greater need for them, and the interviewees perceived evaluation as positive.

Regarding the second sub-question, all male students reported developing their oral proficiency predominantly through gaming at home, and they believed that gaming would also be important for their future language development. Tim reported having developed his oral skills mostly in recent years, especially by speaking via Skype outside of school.

Ned remembered learning the word ‘door’ with the help of his grandfather, who had visited him and asked him to open the door when arriving at Ned’s home:

I remember when I learnt the word ‘door’ in English because my grandpa from England said, ‘You can open the door’. And I asked, ‘Door? What’s that?’ And he pointed at it. And I said, ‘Oh dør [Norwegian word for door]!’ He pointed again at the door and answered, ‘No, door in English!’ And I said, ‘Oh, it is called door in English’.

The interviewees talked in English about rules and vocabulary in school, but not out of school. Faith’s teacher taught the class the different pronunciations of the spelling ‘ea’—that is, the diphthongs /eə/ and /ɪə/. This issue emerged in a communication problem that Faith had with her teacher:

She [the teacher] understood what I meant, but she laughed a little bit at me when I was supposed to say ‘beard’ in English and I didn’t manage to pronounce it correctly and confused ‘bear’ and ‘beard’.

In contrast to the boys, all three girls confirmed that they spoke much more English at school than at home. Grace emphasised her English teacher’s role when it came to feedback: ‘When I use the wrong words or something like that, it mostly happens in English class.’

DISCUSSION: ECOLOGICAL TRANSITIONS AND AGENTIC MOMENTS

Ken’s new habit of suddenly using <http://major-gaming.com>⁴ may be considered an important ecological transition or even an agentic moment in his English ‘digital learning life’ (Erstad, 2013, p. 14)—a particular subgroup of ecological transitions. He believed that the repetitive use of this artefact in the past had improved his English output (*iterative past*), that his English was now really good (*practical-evaluative present*) and that he could improve it by further gaming (*projective future*) (Emirbayer & Mische, 1998). This case exemplifies agency instigated by a digital artefact. This phenomenon may also be considered an important ecological transition because Ken’s position in his

4. The domain is now for sale, but was used by the interviewee in the past.

ecological environment was ‘altered as the result of a change in role, setting or both’ (Bronfenbrenner, 1979, p. 26). His will to ‘act, to experience and to exist’ or his ‘identity that has been formed through participation’ in his peer community can be called agency (Kumpulainen et al., 2010, p. 23).

Regarding other ecological transitions within learning ecologies, the most interesting cases are Ned and Faith. The following radiographic representation highlights Ned’s ecological transitions and agentic moments.

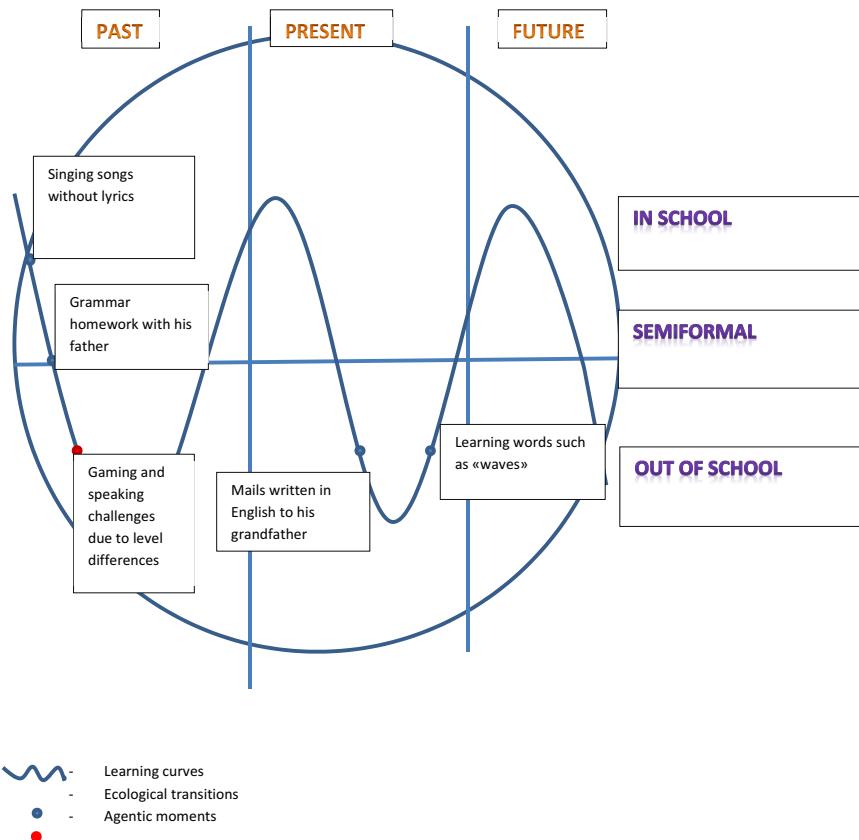


Figure 1: Ned's ecological transitions

Regarding Ned’s challenges due to level differences in gaming and speaking English, we may talk of agency as authoritative action (Greeno, 2006). Ned did something that he had not been taught explicitly to do—namely, improve his English. He became his own agent for change and achieved agency. Biesta and Tedder’s (2006, pp. 18, 22) more ecological approach can also be seen here, as Ned ‘achieved’ agency by means of this specific and particular situation. It was the context that ‘engaged’ with Ned and made him improve his English. This essential moment in Ned’s learning life history was confirmed in the member check interview and is highlighted in red in Figure 1 above because the level of agency may be considered superior to other ecological transitions.

The following representation of Faith’s learning ecology facilitates the interpretation of her ecological transitions and agentic moments.

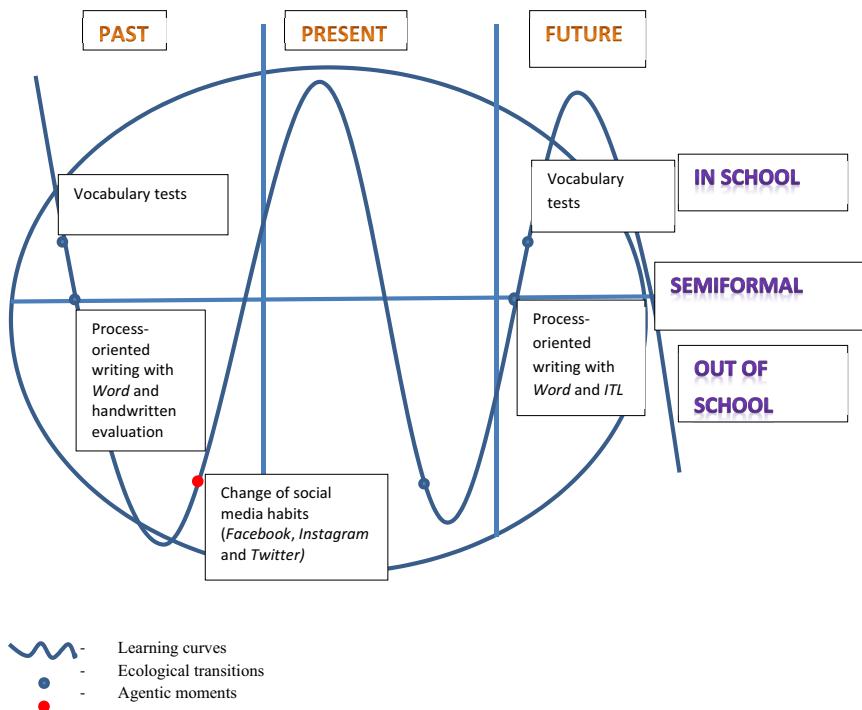


Figure 2: Faith's ecological transitions

In the case of Faith, we see an important ecological transition when she compares the past with the future in the case of non-digital versus digital process-oriented writing. The teacher used to write comments in pen on the printout of the students' essays composed in Word. Faith thought that she would learn English more efficiently with ITL in the future.

Notwithstanding, the change and spread of social media habits, namely the use of Twitter in addition to Facebook and Instagram, is deemed more essential than ITL in Faith's learning trajectory because she has formed her identity more through participating in the former (Kumpulainen et al., 2010, p. 23). Thus, we may perceive an agentic moment in Faith's PELE.

All the male and female interviewees asked and answered questions in English because their English teacher had introduced this rule in the Facebook group. In this case, we could talk about conceptual agency. Pickering (1995) introduced this notion to describe cases in which Internet users adapt or modify the domain and treat the concepts, methods and information of the domain as resources. The interviewees adapted and modified the concepts and methods of Facebook by spontaneously asking and answering questions in English and not in Norwegian.

DISCUSSION: MEANINGFUL OUTPUT AND LANGUAGE DEVELOPMENT THEORIES

This study shows that writing was rather infrequent outside of school, while speaking was frequent in the case of the boys' out-of-school learning. According to Swain (1995), there are good opportunities for output when the learner is compelled to relay messages clearly and explicitly (p. 128). This 'pushed output' is beneficial for language acquisition. It is worth mentioning that Swain's theory on 'pushed output' correlates with theories on interlanguages' communicative needs (Selinker, 1972; Corder, 1978, 1982).

Faith confusing the words 'bear' and 'beard' was a case of communicative need. At the same time, we may discuss Faith's noticing function, the hypothesis testing and eventually the metalinguistic function of output in class with her teacher (Swain, 1995, p. 128). The hypothesis testing of output can also be seen in the situation in which Tim tested his English pronunciation of a song in front of the teacher without lyrics.

Our findings suggest that for the female students, the testing of words and the subsequent metalinguistic function of output predominantly occurred in school and not at home. Since Swain's (1995) metalinguistic function of output mostly occurred in school, the function of in-school learning in relation to out-of-school learning may be viewed as compensatory.

Ned also mentioned how he had learnt the English word 'waves'. He had to mime the word and his cousin helped him find the right English word. In compliance with Pica's et al. (1989) notion of postmodified output and Swain's (1995) first function of output, we might note a case of confirmation check or clarification as an interactional move and a 'noticing the gap' function of output here. The interaction with his cousin, who modified his non-verbal output, enabled Ned to learn the word 'waves'.

All three male students noticed communication problems in several situations on Skype, especially with other gamers who were not native English speakers or used British English instead of American English. The noticing function and the hypothesis testing could be deemed relatively high in their out-of-school learning. However, the metalinguistic function of output played a minor role outside of school. The hypothesis formulation and the testing of words were not followed by a metalinguistic phase, since everything occurs quickly during gaming. The metalinguistic function seemed to be part and parcel of in-school learning for all interviewees. The interviewees reported discussing vocabulary and grammar regularly in school. They never talked about this with other gamers or social media users.

One major finding of this study is linked to the absence of the metalinguistic function of output in out-of-school situations. Tim provided a good example: Sentences such as 'You have to come at me' could easily be misunderstood and confused with sentences like 'You have to come after me'. We could say that

the testing phase was not followed by a metalinguistic phase in which an English teacher could have told Tim that the phrase ‘to come at me’ is a popular, but incorrect way of speaking English. In-school learning may have an important and compensatory function here. The following figure illustrates our main findings on oral output in relation to Swain’s output hypothesis (1985):

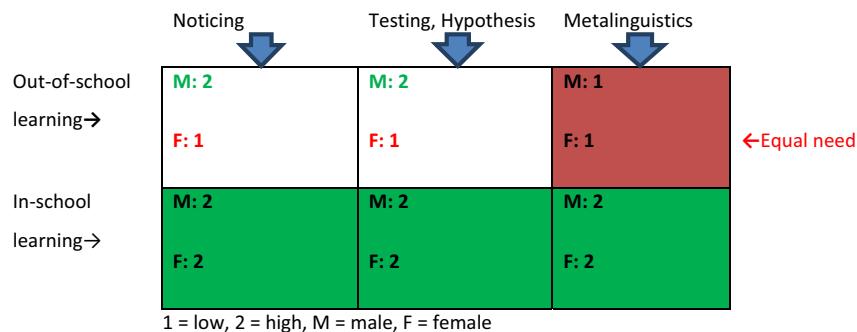


Figure 3: Male and female self-perceived oral output in and out of school

All three girls confirmed that they mostly spoke English in school and not at home. This could mean that all three functions of output were mostly present in school and not necessarily outside of school. In the case of the male students, the first and second functions of output occurred outside of school. Only the third stage, the metalinguistic function, was missing. The boys seemed to have an advantage in out-of-school learning because they experienced ‘pushed’ output situations and could test out new words more frequently. This paper advocates that meaningful output presupposes the occurrence of communicative needs, and this plays an important role in the development of interlanguages (Selinker, 1972, Corder, 1982). One example was given by Ned, who had not understood the word ‘door’ in English and had to ask for clarification (Pica et al., 1989). If the learner experiences no needs, he will not learn English. Based on these findings, for all students, the role of in-school learning was important for the metalinguistic function, whereas the in-school learning was particularly important for the noticing function and testing/hypothesis formulation among the female students.

The following figure illustrates our main findings in relation to written output:

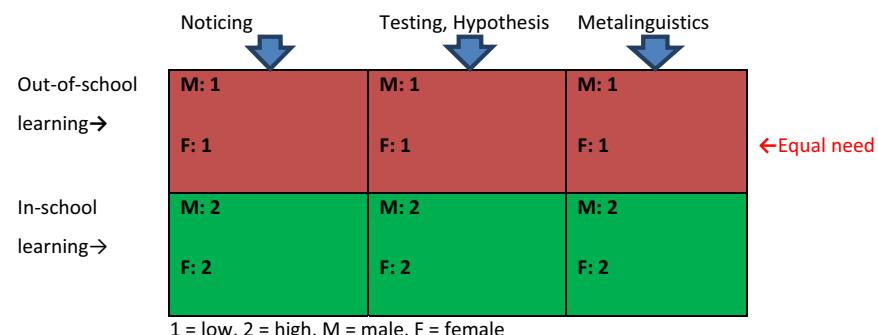


Figure 4: Male and female self-perceived written output in and out of school

No differences emerged between the girls and boys in relation to written output. This paper contends that school still plays an important, and even compensatory, role when it comes to the development of written skills.

The findings of this study indicate that the noticing, testing and metalinguistic functions of written output were scarce in all interviewees' out-of-school learning, but seemingly well-balanced at school. Ned emphasised the importance of essays, in which students could try out new words. In these cases, the metalinguistic function of output was epitomised by the teacher's form-based comments on the essays.

Generally, we might say that the dichotomy of out-of-school learning versus in-school learning is not necessarily always useful with respect to learning ecologies, especially in the cases of homework and vocabulary tests. In many situations, in-school learning occurred outside of school and vice versa. This paper argues that transferring out-of-school learning to in-school learning is not necessarily a panacea.

LIMITATIONS

The aim of this enquiry was not to obtain high external validity. This is obviously not possible with only six interviewees. Other qualitative studies will have to confirm the study's findings. The main focus of this study was on the quality and the depth of the interviews. Further, the study does not give an exhaustive image of learning in and out of school, as it offers only the voices of the students and their reminiscences of where they had learnt English. Self-report studies may frequently have validity problems because the evidence is based on what the informants think and remember (Howard, 1994; Kvæle & Brinkmann, 2009, p. 252; Mays & Pope, 1995). However, it must be stressed that the validity of the data might have been enhanced by the fact that all the students were interviewed three times (focus, FtF and member check interviews).

Undeniably, there is bias in all in-depth interviews. There are various ways to improve the validity of self-report studies, such as avoiding leading questions. Leading questions were avoided in the first and the second phases of this study. Open questions were added to allow the interviewees to expand upon their replies, and confidentiality was reinforced to stimulate more truthful responses. However, some leading questions were used in the third phase. According to Kvæle and Brinkmann (2009), leading questions are well suited to 'repeatedly check the reliability of the interviewees' answers, as well as to verify the interviewer's interpretations' (p. 172).

Our enquiry establishes, to a certain degree, theoretical validity. By relating most interview questions concretely to the temporal-relational conceptualisation of agency in Emirbayer and Mische's (1998) 'chordal triad', we go

'beyond concrete description and interpretation and explicitly address the theoretical constructions that the researcher brings to, or develops during the study' (Maxwell, 1992, p. 50).

In terms of reliability, stability and equivalence are important in qualitative research (Grønmo, 2004, p. 222). This study does not have any equivalence because no researcher has conducted a similar study with the same interviewees at the same time. However, stability was obtained because, in some cases, the same interviewees were asked the same questions during the same interviews, such as the FtF interviews and the member check interviews six months later. In other words, iterative questioning (Shenton, 2004, p. 67) and member checking (Carlson, 2010, p. 1105; Stanley, 2015, p. 31) played a major role in terms of stability and, thus, reliability. Further, all analyses in this enquiry were done by the same researcher, which may have influenced the reliability of the results. However, excerpts from the interviews were debriefed with peers (Marshall & Rossman, 2011, p. 221) to improve the reliability and reduce potential bias.

Last but not least, different forms of interviews (short versus long, group versus individual) were carried out at different times, with an interval of two months between the focus and FtF interviews and six months between the FtF and member check interviews. This form of 'triangulation' might improve the credibility of this study (Creswell & Miller, 2000, p. 126; Denzin, 1978, p. 291).

CONCLUSION

This self-report study mapped and elucidated the importance of meaningful output within PELE in the past, present and future of six students attending upper secondary school. It offers valuable new information about broader conceptualisations of second language acquisition that emphasise the importance of ecological as well as didactic aspects. It adds to the present body of knowledge of English in-school and out-of-school learning which, in contrast to former studies (Pearson, 2004; Sylven, 2004; Pickard, 1996; Sundqvist, 2009; Sundqvist & Sylvén, 2014), includes written skills and the use of both digital and non-digital artefacts.

The male and female students used different non-digital (boys: songs, grammar exercises; girls: songs, vocabulary tests) and digital artefacts (boys: real strategy games; girls: social media) in the past. The present and the future of their learning ecologies are and will probably be influenced by digital artefacts (boys: real strategy games at home, ITL and Kahoot in groups at school; girls: social media at home, ITL and Kahoot in groups at school) to produce meaningful written and oral EFL output.

An important implication of this study is that out-of-school learning might be important for oral output for males, while in-school learning seems essential for oral output for females, especially for the noticing and testing functions of output. In general, school may have a complementary function to out-of-school learning and, in some cases, even a compensatory function when we, for example, look at all three functions of written output and the metalinguistic function of out-of-school oral output. Future research should focus on possible links between meaningful output and digital and non-digital artefacts in EFL. Teachers may benefit from exploring this issue to design good English lessons. It might be useful to carry out other qualitative studies to analyse more exhaustively students' ecological transitions, their development of agency and meaningful pushed output situations in EFL.

REFERENCES

- Barron, B. (2006). Interest and self-sustained learning as catalysts of development. *Human Development*, 49(4), 193–224. DOI: <http://dx.doi.org/10.1159/000094368>.
- Biesta, G., & Tedder, M. (2006). *How is agency possible? Towards an ecological understanding of agency-as-achievement* (Working Paper 5. Learning Lives). Retrieved from https://www.researchgate.net/profile/Michael_Tedder/publication/228644383_How_is_agency_possible_Towards_an_ecological_understanding_of_agency-as-achievement/links/00b4952cadd9bd2b6a000000.pdf.
- Blikstad-Balas, M. (2012). Digital literacy in upper secondary school – What do students use their laptops for during teacher instructions? *Nordic Journal of Digital Literacy*. Retrieved from http://www.idunn.no/ts/dk/2012/02/digital_literacy_in_upper_secondary_school_-_what_do_studen?mode=print&skipDecorating=true&textSize=.
- Bronfenbrenner, U. (1979). The ecology of human development: Experiments by nature and design. Cambridge, MA: Harvard University Press.
- Carlson, J. A. (2010). Avoiding traps in member checking. *The Qualitative Report*, 15(5), 1102–1113. Retrieved from <http://www.nova.edu/ssss/QR/QR15-5/carlson.pdf>.
- Corbin, J., & Strauss, A. (2015). Basics of qualitative research. Techniques and procedures for developing grounded theory. Thousand Oaks, CA: Sage Publications.
- Corder, S. P. (1978). Language-learner language. In J. C. Richards (Ed.), *Understanding second and foreign language learning: Issues and approaches*. Rowley, MA: Newbury House Publishers.
- Corder, S. P. (1982). *Error analysis and interlanguage*. Oxford, UK: Oxford University Press.
- Cowie, H., & van der Aalsvort, G. (Eds.) (2000). *Social interaction in learning and instruction*. Oxford, UK: Pergamon.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 39(3), 124–130. DOI: http://dx.doi.org/10.1207/s15430421tip3903_2.
- Dabbagh, N., & Kitsantas, A. (2012). Personal learning environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and Higher Education*, 15(1), 3–8. DOI: <http://dx.doi.org/10.1016/j.iheduc.2011.06.002>.
- Dalsgaard, C. (2011). Personlige læringsmiljøer: Universitetsuddannelse på internettet. *Dansk universitetspædagogisk tidsskrift*, 6(11), 8–13. Retrieved from <http://ojs.statsbiblioteket.dk/index.php/dut/article/view/5534/4840>.
- Denzin, N. K. (1978). *The research act* (2nd ed.). New York, NY: McGraw-Hill.
- Ellis, R., & He, X. (1999). The roles of modified input and output in the incidental acquisition of word meanings. *Studies in second language acquisition*, 21(2), 285–301. DOI: <http://dx.doi.org/10.1017/s0272263199002077>.

- Emirbayer, M., & Mische, A. (1998). What is agency? *American Journal of Sociology*, 103, 962–1023. DOI: <http://dx.doi.org/10.1086/231294>.
- Erstad, O. (2013). Digital learning lives. Trajectories, literacies and schooling. New York, NY: Peter Lang.
- Erstad, O. (2014). The expanded classroom – Spatial relations in classroom practices using ICT. *Nordic Journal of Digital Literacy*, 9(1-2014), 8–22.
- Eshach, H. (2007). Bridging in-school and out-of-school learning: Formal, non-formal, and informal education. *Journal of Science Education and Technology*, 16(2), 171–188. DOI: <http://dx.doi.org/10.1007/s10956-006-9027-1>.
- Fernández, M., Wegerif, R., Mercer, N., & Rojas-Drummond, S. (2001). Re-conceptualizing “scaffolding” and the zone of proximal development in the context of symmetrical collaborative learning. *Journal of Classroom Interaction*, 36(2/1), 40–54.
- Galletta, A. (2013). Mastering the semi-structured interview and beyond: From research design to analysis and publication. New York, NY: NYU Press.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Greeno, J. (2006). Commentary: Authoritative, accountable positioning and connected, general knowing: Progressive themes in understanding transfer. *Journal of the Learning Science*, 15(4), 537–547. DOI: http://dx.doi.org/10.1207/s15327809jls1504_4.
- Grønmo, S. (2004). *Samfunnsvitenskapelige metoder*. Bergen, Norway: Fagbokforlaget.
- Hatlevik, O. E., Ottestad, G., Høie Skaug, J., Kløvstad, V., & Berge, O. (2009). *ITU Monitor 2009: Skolens digitale tilstand*. Oslo, Norway.
- Hatlevik, O. E., Egeberg, G., Gudmundsdottir, G. B., Loftgarden, M. & Loi, M. (2013). *Monitor skole 2013*. Om digital kompetanse og erfaringer med bruk av IKT i skolen, Senter for IKT i utdanning, Oslo, Norway.
- Howard, G. S. (1994). Why do people say nasty things about self-reports? *Journal of Organizational Behavior*, 15(5), 399–404. DOI: <http://dx.doi.org/10.1002/job.4030150505>.
- Kumpulainen, K., Krokfors, L., Lipponen, L., Tissari, V., Hilppö, J., & Rajala, A. (2010). *Learning bridges. Toward participatory learning environments*. Helsinki, Finland: CICERO Learning, University of Helsinki.
- Kvale, S., & Brinkmann S. (2009). *Interviews. Learning the craft of qualitative research interviewing*. London, UK: Sage Publications.
- Littelton, K., & Light, P. (1999). *Learning with computers: Analysing productive interaction*. London, UK: Routledge.
- Marshall, C., & Rossman, G. B. (2011). *Designing qualitative research* (5th ed.). Thousand Oaks, CA: Sage Publications.
- Martindale, T., & Dowdy, M. (2010). Personal learning environments. In G. Veletsianos (Ed.), *Emerging technologies in distance education* (pp. 177–194). Edmonton, Canada: Athabasca University Press.
- Maxwell, J. A. (1992). Understanding and validity in qualitative research. In A. M. Huberman & M. B. Miles (Eds.), *The qualitative researcher's companion* (pp. 37–64). Thousand Oaks, CA: Sage Publications.
- Mays, N., & Pope, C. (1995). Qualitative research: Rigour and qualitative research. *BMJ*, 311(6997), 109–112. DOI: <http://dx.doi.org/10.1136/bmj.311.6997.109>.
- Mishra, P., & Koehler, M. (2008). *Introducing technological pedagogical content knowledge*. Paper presented at the Annual Meeting of the American Educational Research Association, New York City, March 24–28, 2008. Retrieved from http://punya.educ.msu.edu/presentations/AERA2008/MishraKoehler_AERA2008.pdf.
- Nagy Hesse-Biber, S., & Leavy, P. (2011). *The practice of qualitative research*. London, UK: Sage Publications.

- Pearson, N. (2004). The idiosyncrasies of out-of-class language learning: A study of mainland Chinese students studying English at tertiary level in New Zealand. In H. Reinders, H. Anderson, M. Hobbs, & J. Jones-Parry (Eds.), *Supporting independent learning in the 21st century*. Proceedings of the inaugural conference of the Independent Learning Association, Melbourne, Australia, 20 September 2003. Retrieved from http://www.independentlearning.org/uploads/100836/ila03_pearson.pdf.
- Pickard, N. (1996). Out-of-class language learning strategies. *ELT Journal*, 50(2), pp. 150–159. DOI: <http://dx.doi.org/10.1093/elt/50.2.150>.
- Pickering, A. (1995). *The mangle of practice*. Chicago, IL: University of Chicago Press. DOI: <http://dx.doi.org/10.7208/chicago/978022668253.001.0001>.
- Pica, T., Holliday, L., Lewis, N., & Morgenthaler, L. (1989). Comprehensible output as an outcome of linguistic demands on the learner. *Studies in Second Language Acquisition*, 11(1), 63–90. DOI: <http://dx.doi.org/10.1017/s027226310000783x>.
- Rasmussen, I., Rindal, U. E., & Lund, A. (2014). Læringsressurser og arbeidsformer i engelsk: Ungdomsskoleelevers arbeid med sjangeren fantasy. En casestudie i prosjektet ARK&APP, engelsk, 8. Klasse. Oslo, Norway: Universitetet i Oslo.
- Salomon, G., & Perkins, D. N. (2005). Do technologies make us smarter? Intellectual amplification with, of and through technology. In R. J. Sternberg & D. D. Preiss (Eds.), *Intelligence and technology* (pp. 71–86). Mahwah, NJ: Lawrence Erlbaum Associates.
- Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics in Language Teaching*, 10(1–4), 209–232. DOI: <http://dx.doi.org/10.1515/iral.1972.10.1-4.209>.
- Selwyn, N. (2008). *Education 2.0? Designing the web for teaching and learning*. ESRC Teaching and Learning Research Programme commentary. Retrieved from <http://www.tlrp.org/pub/documents/TELcomm.pdf>.
- Shehadeh, A. (1999). Gender differences and equal opportunities in the ESL classroom. *ELT Journal*, 53(4), 256–261. DOI: <http://dx.doi.org/10.1093/elt/53.4.256>.
- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2), 63–75.
- Stanley, M. (2015). Qualitative descriptive. A very good place to start. In S. Nayar & M. Stanley (Eds.), *Qualitative research methodologies for occupational science and therapy*. New York, NY: Routledge.
- Sundqvist, P. (2009). Extramural English matters: Out-of-school English and its impact on Swedish ninth graders' oral proficiency and vocabulary. Karlstad, Sweden: Karlstad University Press.
- Sundqvist, P., & Sylvén, L. (2014). Language-related computer use: Focus on young L2 English learners in Sweden. *ReCALL*, 26(1), 3–20. DOI: <http://dx.doi.org/10.1017/S0958344013000232>.
- Swain, M. (1985). Communicative competence: Some roles of comprehensible input and comprehensible output in its development. In S. Gass, & C. Madden (Eds.), *Input and second language acquisition* (pp. 235–252). Rowley, MA: Newbury.
- Swain, M. (1993). The output hypothesis: Just speaking and writing aren't enough. *The Canadian Modern Language Review*, 50(1), 158–164.
- Swain, M. (1995). Three functions of output in second language learning. In G. Gook & B. Seidlhofer (Eds.), *Principle and practice in applied linguistics* (pp. 125–144). Oxford, UK: Oxford University Press.
- Sylvén, L. (2004). Teaching in English or English teaching? On the effects of content and language integrated learning on Swedish learners' incidental vocabulary acquisition. Gothenburg, Sweden: Acta Universitatis Gothoburgensis.
- Sylvén, L., & Sundqvist, P. (2012). Gaming as extramural English L2 learning and L2 proficiency among young learners. *ReCALL*, 24(3), 302–321. DOI: <http://dx.doi.org/10.1017/S095834401200016X>.

- Uuskoski, O. (2011). Playing video games: A waste of time... or not? Exploring the connection between playing video games and English grades. Unpublished Master's thesis, University of Helsinki.
- Van Lier, L. (1997). Observation from an ecological perspective. *TESOL Quarterly*, 31(4), 783–787. DOI: <http://dx.doi.org/10.2307/3587762>.
- Van Lier, L. (2004). The semiotics and ecology of language learning: Perception, voice, identity and democracy. *Utbildning & Demokrati*, 13(3), 79–103.
- Van Lier, L. (2010). The ecology of language learning: Practice to theory, theory to practice. *Procedia-Social and Behavioral Sciences*, 3, 2–6. DOI: <http://dx.doi.org/10.1016/j.sbspro.2010.07.005>.
- Vaage, O. F. (2014). *Norsk mediebarometer 2014*. Oslo-Kongsvinger, Norway: Statistisk sentralbyrå.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John Steiner, S. Scribner, & E. Souberman, Trans.). Cambridge, MA: Harvard University Press.
- Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: MIT Press.
- Wengraf, T. (2001). Qualitative research interviewing: Biographic narrative and semi-structured methods. London, UK: Sage Publications.
- Willoughby, T. (2008). A short-term longitudinal study of Internet and computer game use by adolescent boys and girls: Prevalence, frequency of use, and psychosocial predictors. *Developmental Psychology*, 44(1), 195–204. DOI: <http://dx.doi.org/10.1037/0012-1649.44.1.195>.