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Effectiveness of ICT Supported Language Learning Methods Among Young Adults

Thesis booklet

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1. Introduction

Changes in society generated a pronounced, massive need for language acquisition, which is difficult to realize through traditional teaching tools. With the appearance of the new digital technologies and rapid development of ICT tools, the so called "digital revolution" appeared as a new factor with a great educational impact that cannot be ignored. Language teaching has to adopt new methodologies and adjust educational theory to innovative practice. Therefore, the Budapest Business School, the venue for our research, also prepared e-learning materials for English and German language and shared it with learners through the Moodle virtual learning environments (http://moodle.bgf.hu)

The research of this field is useful and is needed for the society because the foreign language competency is a skill that is listed among the 20 most important skills what companies demand from their potential employees. (*Anderson & Gantz*, 2013) In Hungary, unfortunately, language proficiency level has been traditionally low, despite all methodological innovation efforts. According to a survey by *Eurobarometer*, statistics agency of the European Union, executed on a representative sample in the EU (n=26.751), the language proficiency level of Hungarians has decreased, compared to the reports from the year 2006. In 2012, only 35% of the population spoke a second language on intermediate level. With this result, Hungary is on the 26th place, out of 27th on this list. (*Eurobarometer*, 2012) Developing language skills is not only important for individuals but also for society, because in a more and more globalized world, those who cannot communicate are disadvantaged.

In the studies reported here, our research focused on the acquisition of German language, which is the second most popular language of our institution and also in our country. Therefore, results of our research about the potentials and challenge of Computer-Assisted Language Learning (CALL) and related methodologies has a potentially big impact on a large amount of language learners in Hungary.

2. Theoretical background

The methodological framework of our research was Computer Assisted Language Learning (CALL), a method existing since the 1960s. Its development runs parallel to the dominant trends in the language instruction. So in the beginning, its focus was on the drill tasks (restricted CALL), but since the 80s, communication moved to the focus (open CALL) and since the proliferation of the Internet we can talk about integrative CALL, where the tools become everyday practice of the teachers. (*Delcloque*, n.d.) CALL's development is still ongoing, because the use of digital tools is not as natural like the use of the traditional tools yet. (*Bax*, 2011) Some theoreticians propose that Computer Assisted Language Learning (CALL) is not an appropriate name anymore, because thanks to technological developments, a lot of new ICT tools have emerged, like smartphones and tablets, and these tools can easily replace computers. Hence

there are some who call this research area Mobile Assisted Language Learning (MALL). (*Jarvis & Krashen*, 2014)

Accepting this change of technology-driven methodological emphasis, in the first part of our research, from 2008 till 2012, we used CALL tools (virtual learning environments and interactive whiteboards), but in the last year of our research, in 2014, we also examined the use of a mobile application installed on mobile phones and tablets.

In order to utilize ICT tools effectively, we need special skills and competences. *Digital literacy* is a person's ability to perform tasks effectively in a digital environment. Digital means information represented in numeric form and primarily use by a computer, and literacy includes the ability to read and interpret media, to reproduce data and images through digital manipulation and to evaluate and apply new knowledge gained from digital environments (*Jones-Kavalier & Flannigan*, 2008). *Digital literacy* is a general term of skills and abilities that stand for the awareness of technological procedures and terminologies (1), planning and realizing tasks via ICT tools (2), implementing technology supported methods and strategies with the aim of effective learning (3), skill to follow technology supported learning processes (4) and the use of ICT tools to seek information related to learning tasks (5). (*Lakatosné & Kárpáti*, 2009) The most important components of digital literacy are common for future computer users and ICT professionals: accessing, managing, evaluating, integrating, creating, and communicating information individually or collaboratively in a networked, computer-supported, and web-based environment for learning, working, or leisure. (*Kárpáti*, 2011) So there are the general competences for the ICT users like the use of PCs and ICT tools and there are the special competences for digital learning (e.g. collecting and evaluating information) that can be enhanced through targeted educational efforts. Regarding our research both of these competences were essential.

When discussing the relevance of ICT competence for CALL or MALL, we have to mention the human factor. Plenty of publications emphasize that the ICT tools, at their current level of development, can not replace the teacher, so the human factor is still crucially important for the learning success, but the role of the teacher is in transformation. (*Dorner*, 2012) Teachers have lost their position as exclusive owners of the knowledge, and shifted to the role of facilitator and mentor. According to *Sutherland* (2004), a lot of teacher misinterpret their role and think they can pass over their teaching responsibility to an ICT tool. He suggests further that the teacher has still the dominating role for creating the social and cultural space needed for learning. He brings an example that learners can not spontaneously discuss about the Italian Renaissance, the teacher have to help them, have to motivate them for that.

Since the late 1980s, with the spread of digital technologies in classrooms, concepts of

digital pedagogy and e-learning have been in use. Even "digital taxonomies" have been developed, based on *Bloom's* taxonomy model from 1956. According to this model, *Remember* replaces *Knowledge*, *Understand* will be conceived as *Comprehension*, *Evaluate* will be *Synthesis* and *Create* replaces *Evaluation*. (*Skiba*, 2013) So the pedagogical practice became more pragmatic.

The transformation of traditional pedagogy and the rise of digital pedagogy caused change in learning strategies. (*Tóth & Pentelényi*, 2007) Learning style is a cluster of preferences, tendencies and strategies that are used by the learner during the learning process. There are some researchers, who think that learning style typology has its roots go in ancient Greek times (*Bailey et al.*, 1976), but there are also some who say that these strategies exist only since the appearance of the cognitive psychology (*Rayner & Riding*, 1997 cited by *Sadler-Smith*, 1999)

In language learning, motivation is the most important element beside language skills and communication competence. Mastery motivation can enhance the optimal acquisition of a skill, - a result also relevant for language skill. Mastery motivation is an inherited component of personality. Motivation can enhance learning and during interactions with the environment, stimulus can result in a change of behavior (*Hunt*, 1961, cited by *Józsa*, 2002) These motives are part of a competence, but they are separated from skills. (*Nagy*, 2000) In the planning of learning processes, it is advisable to create such learning situations either via ICT tools or other instruments or through appropriate methodologies (e.g. collaborative leaning) in order to integrate informal scenes of learning with formal ones. Such an approach may increase the motivation of the learner. ICT tools and collaborative methodology can be combined very effectively. (*Alhinty*, 2015)

The desktop computer, a classic tool of CALL, became, with the appearance and prevalence of the Internet an effective tool in more and more complex, virtual learning environments. Unfortunately, effects of ICT use are difficult to measure. A lot of publications provide controversial results, but many meta-analyzes state that ICT tools are effective for developing listening skills and reading comprehension. (*Felix*, 2008; *Hui et al.*, 2008; *Leakey*, 2011) Some researchers suppose that developmental effect of ICT depends on the type of the knowledge. If knowledge is explicit and can be clearly described like vocabulary acquisition in language learning, it can be more effectively delivered to and acquired by learners via ICT tools. But on the other hand, tacit knowledge (e.g. speaking a second language) is harder to develop in a CALL setting. (*Awad*, 2004; *Andringa et al.*, 2015)

3. Research design, hypothesis, tools and sample

In our research reported here, we tried to get solid evidence about the effectiveness of the ICT tools on the development of language acquisition skills. Therefore, we developed a research

design that involved a variety of tools and experimental settings. The research questions can be assigned to the following (partly overlapping) methodological issues: qualitative questions (a), quantitative measurements regarding tool usage (b), differences between groups and learners (c), differences between teaching materials (d), Data correlation (e), impact on performance (f). (*Dyckhoff et al.*, 2013)

3.1. Methods, sample and tools

From September 2007 till May 2014, we experimented with different ICT-based language learning methods and evaluated their results on student performance and their relationship with indicators of behavior like motivation each semester. We studied listening and reading comprehension, vocabulary and grammar acquisition among German learners of our college in an experimental and control group design with different ICT tools. The majority of our sample were female, 20-year-old students. 438 students participated in the research project with the largest research conducted from March 2010 till December 2010 involving 148 students and eight lecturers responsible for the experimental and control settings. Experimental groups used ICT tools and digital and materials exclusively, whereas the control group used paper-based learning materials and traditional tools. We employed pre- and post-hoc assessment of performance. Before the first experiment, in September 2008, we performed a survey among students about the knowledge and use of ICT tools like virtual learning environment and interactive whiteboard, both available at our college.

3.2. Hypothesis

We formulated our hypotheses about language acquisition, ICT competence, motivation and learning strategies.

Hypothesis about language acquisition

Hypothesis (H1)

The regular use of ICT tools in a collaborative learning environment makes language acquisition more effective.

- The research group will perform better at the vocabulary and grammar tests and at the reading and listening comprehension tasks at the end of the year.
- The research group will perform better at the reading compression tasks.
- ICT tools will be more effective in the groups that manifest a lower language performance level at the beginning of the development process.

Hypotheses about ICT competence

Hypothesis (H2)

Level of ICT competence will affect the pace of language acquisition in both the experimental and the control groups.

Hypothesis (H3)

Learners with higher ICT competence will use the functions of the virtual learning environments (tests, comments and downloads) more frequently.

Hypothesis (H4)

The ICT competence of the teacher will not influence the effectiveness of the course either in the experimental or in the control group.

Hypothesis about motivation

Hypothesis (H5)

Learners in the research group using ICT tools will be more motivated then to members of the control group.

Hypothesis about learning strategies

Hypothesis (H6)

The learning style of participants during the experiment will shift toward a more beneficial learning style.

Hypothesis (H7)

The learning style of the students will affect their performance at the language tests and correlate with their motivation score.

Hypothesis (H8)

The teaching style of the teacher will not influence the effectiveness of the course either in the experimental or in the control group.

4. Results

Result (R1)

According to our performance assessment results, ICT tools affect language skills differently. On the majority of the reading and the listening comprehension task, in one of the grammar test and in one of the vocabulary and grammar test, the experimental group performed significantly better.

Result (R2)

We did not find evidence about the effect of the level of ICT competence on the pace of language acquisition in any of the groups. Using an ICT competence inventory successfully employed for assessing the digital literacy of students and teachers, we developed indices for ICT competence and access as well as ICT-related attitudes and activities. We did not find any correlations between these four ICT indices and the test results of the experimental or control groups whose digital literacy level was almost identical. Peculiarly enough, the level of ICT-related activities was lowest among indices related to digital literacy.

Result (R3)

We could not prove that the students with high ICT competence use the functions of the virtual learning environments more frequently then their counterparts with lower digital literacy values. We found that the ICT attitude and the ICT activity index were the two indices showing significant correlations with one of the three functions of the VLE (test completion, document download and forum posts). In this study, however, we could not obtain enough evidence to suggest a clear trend or pattern in the results. In further research, it would be advisable to monitor these two ICT indices, in order to prove the related hypothesis.

Result (R4)

There were no correlations among the means computed from the ICT indices of the teachers and the means of the test-performance calculated for the whole group of students. Therefore, we consider this hypothesis proven: the ICT competence of the teacher do not effect the effectiveness of the course.

Result (R5)

We found no evidence that members of the ICT supported research group were more motivated then the members of the control group. The motivational values of the control group were till 2014 always above the values of the experimental group. We found only higher motivation values for the experimental group: namely, in the experiment with mobile devices. A likely explanation for that may be the short term novelty effect of mobile devices. To decide whether mobile devices are really more motivating than other ICT tool, further research is needed.

Result (R6)

Analyzing the responses of students in both the experimental and control groups we did not find any correlations between the groups or between the values of the learning styles measured at the pre- and the post-measurement. Due to lack of evidence we rejected the hypothesis.

Result (R7)

We compared the test results of students with their results achieved on the learning style questionnaire. In this case, we did not find any significant correlation. But between the learning style and the motivational values we found significant correlations. The trend is that the two positive learning strategies, (the so-called "deep approach" and the strategic approach) have strong correlations between all of the subcategories of the motivation values. These subcategories were (*Kétyi*, 2015; 2016): 1. Benefits of language learning, 2. Impressions about language learning, 3. Feedback regarding language learning performance (teacher' evaluation of student's language skills), 4. External factors of motivation, 5. Willingness to spend time with language learning. The third subcategory did not really benefit the learning style, and the so-called surface apathetic approach had negative correlations with the motivation scores. At the second measurement in May 2010, positive approaches had still positive correlations, but the trend was decreasing. At the last measurement in September 2010, the surface apathetic approach no longer correlated negatively with any of the performance indicators, even showed positive correlation with one motivational category (Feedback on language learning). According

to these findings, there is no correlation between the test results and learning styles, but there is a connection between the learning styles and the motivation score. For the strategic type learner, ICT-supported environments are more motivating than for the deep type and the surface apathetic learner. That is why the first half of the hypothesis is rejected the second half accepted.

Result (R8)

Just like for hypothesis Nr. 4, we could not find any correlation between the means computed from the teaching style of the teacher and the means of the test-performance calculated for the whole group. Therefore, we consider our hypothesis proven: the teaching style of the teacher does not affect the effectiveness of the course.

5. Summary and suggestions for further research

Through our digital literacy survey conducted in 2007, we found that the conditions for the introduction of CALL methodology are available at our institution. The Budapest Business School was furnished with the suitable infrastructure, virtual learning environment and educational software and the students had positive attitudes towards digital technology. So, in 2008, we began our first educational research project with mostly female learners of German as a foreign language aged between 19 and 21. During several iterations of ICT-supported language courses between 2007 and 2014, we collected data from 438 students. We obtained ICT competence, motivation and learning style scores during the whole duration of the project, and course satisfaction data between 2008 and 2011. For collecting data, we used standardized and self-developed tests and survey instruments.

After an analysis of learning performance results and indicators that could have influenced these, we found that the ICT tools used in the teaching experiments did not affect all language skills equally (1). The lack or presence of ICT competence did not have any impact on the pace of language learning (2), the students with high ICT competence do not use the functions of the VLE more frequently than their fellows with lower values (3) and the ICT competence of the teacher did not affect the course effectiveness (4). As for motivation during language learning, the experimental group was less motivated than the control group, with the exception of smartphones that experimental students found a very motivation tool to work with. (5). Learning styles of students in the experimental group did not shift toward the most beneficial "deep approach", (6) and the learning styles do not show any impact on the test results (7). The teaching style of the teachers did not affect the learning performance either (8).

According to these results we think that to evaluate the effect of ICT tools and ICT supported learning methods we need continuous monitoring of the learner activity. We would like to remind again on our results from year 2010 where we identified significant differences in test results on reading and listening in favor of the research group twice. In these cases, ICT activity

was highest in the whole experiment, and this index had significant correlations with other indices.

With the intention of improving learning effectiveness in mind, we suggest to monitor ICT activity continuously and if drops, the teacher should immediately intervene and stimulate activity. Our other suggestion relates to mobile devices, in connection to which tools we identified a significant difference on a grammar and vocabulary test in favor of the research group for the first time. MALL is, in our opinion, a very promising area for future research dedicated to improving the effectiveness of second language acquisition.

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