The Development of Learning Competences through Wiki Tools

Vladimíra Froldová
Faculty of Education, University of Hradec Kralove
vladimira.froldova@uhk.cz

Abstract

This paper reports on a pre-research included in a pedagogical experiment carried out at a Secondary School in Prague. In particular, it focuses on learning outcomes and overall experience concerning the development of learning competences through the use of a wiki in Social Science lessons and realized through the content and language integrated learning (CLIL). Although the main objective of the pedagogical experiment was to enhance English communication skills, the inevitable part of the experiment was to implement wiki tools into autonomous home learning, mainly to create such a learning environment which supports English communication, and particularly to examine the wiki potential for the development of learning competences. Moreover, the pedagogical experiment was supposed to show the extent of students' effort to create and use wiki materials for their learning and cooperation. In the first part, various aspects of implementing learning competences into the learning process are dealt. In the second part, the general concept of a wiki (wikispaces) is introduced, including the practical usage for enhancing learning competences. Followed by research questions and research methodology, where three stages of the teaching and learning process involved in the experiment are introduced, the final part of the paper deals with the outcomes and summarizes their beneficial contributions to a wiki-based pedagogy.

Keywords

pedagogical experiment, learning competences, wiki, wiki-based pedagogy

Introduction

Each secondary school in the Czech Republic is reflecting the national curriculum which among others sets key competences adapted to European Union (EU) legislation (Recommendations, 2006). These key competences, divided into general and specialized ones, are individually elaborated into the school curriculum. Each competence is supposed to be implemented into learning objectives. One of the key competences is the competence to learn. Before carrying out the pedagogical experiment, a survey was made among teachers from an experimental

school concerning their awareness of learning competences. The teachers were asked two questions:

1) Are learning competences included in your subject curriculum?

2) Do you promote learning competences during teaching your subject?

Out of 34 respondents, 20 respondents answered ´yes´ to the first question and 29 respondents answered ´yes´ to the second question. Consequently, we asked the respondents providing the ´yes´ answer to the first question to give three examples of activities which relate to learning competences. Their given examples revealed that only eight respondents were aware of knowledge, skills and abilities which represent learning competences. Twelve respondents gave examples of learning objectives concerning their subjects instead of learning competences.

Above all, having the importance of foreign language competence in mind, these results motivated us to modify the wiki environment not only for learning a second language, but also for enhancing learning competences.

Learning competences

In the Czech school curricular documents there is a slightly different approach to the construct of learning competences than in educational literature. Lokajíčková (2013, 324) states: "That learning competences are not always a synonym to the construct of learning to learn, as it is used mainly in English written literature." and she suggests "Learning competences are considered to be dispositions for managing the situations for learning, while learning to learn is regarded as a process which accompanies learning." Lokajíčková understands the concept of learning to learn to be super-ordinate to the concept of learning competences.

In our experiment we applied the Czech school curriculum approach where learning competences represent the capability to apply or use a set of related knowledge, skills, and abilities required to successfully performed tasks in a defined learning objective. In the Czech school curriculum learning competences are defined as follows (RVP, 2006): the higher secondary education graduate should:

- have a positive attitude to learning and education,

- know different learning techniques;

- be able to create suitable learning's conditions and learning environment,

- put different ways of working with a text into effect (learning and analytical reading), know effectively how to look up information and process it; be reading literate,

- listen to different oral presentations (explanation, lectures, speeches etc.) with understanding and be able to write down notes from different media sources,

- use different information sources including other people's experience as well as their own,

- follow and evaluate their own learning progress and accomplished tasks and be able to accept other people's assessment of their learning results,
- be aware of future possibilities and opportunities in their education, specifically in the field of their specialisation.

Above mentioned learning competences are more similar to generic skills defined by Petty (2014). Petty calls them mini key competences which include synthesis, analysis, evaluation, study skills and affective and social skills. Both learning competences and generic skills reflect skills and abilities which are cross-curricular and enhance desired quality for being competitive on the labour market.

Wiki environment

Recently, many articles on using a wiki technology as a means of fostering computer-supported collaborative learning (CSCL) have appeared on a task-designed research e.g. Bradley, Lindstorm and Rystedt (2010), or Kessler (2010). They investigated what wikis could do as a means to enhance group interaction, when students were encouraged to participate in constructing a text and exchanging peer responses; or Castaneda and Cho (2013) whose students found wiki writing helpful in improving their writing skills. To more theoretical research, which provides insight into pedagogical methodology applied in a wiki, the term of so called wiki-based pedagogy, used by e.g. Hewege and Perera (2013) focused on exploitation and functionality of wikis in curriculum design and sat the implications of a wiki-based pedagogy, which assumes an "emancipator", partial-"constructivist" paradigm of learning. At the same time Cress and Kimmerle (2008) suggested a model analyzing processes which take place in the social system of a wiki as well as in the cognitive systems of the users. The model also describes learning activities as a process of externalization and internalization.

Above mentioned examples of using wikis show the great potentiality of wikis in educational environment.

There are two main reasons why a wiki (wikispaces.com) was chosen as the main online collaborative platform. Firstly, as defined by Larusson and Alterman (2009, p. 372), "The basic wiki has several properties that make it ideal framework for composing different time and place environment. Applications engineered within the style of wiki interactions can support a variety of learning activities ranging from tightly to loosely coupled collaborations. Wiki-based collaborative applications can also support metacognitive tasks, like reflection or self/co-explanation.*"* Secondly, a wiki is considered to be a user-friendly tool.

Research design

From the feedback of students who use wikis in their language lessons we learnt that managing wiki pages was easy for them. They used it as a tool for both synchronous and asynchronous communication and appreciated teacher's feedback to their contributions. The possibility of tracking student's learning progress and enabling students to use their learning preferences makes a wiki the right tool for our experiment.

Research question

The purpose of this study is to examine students' opinions on implementing wiki activities into their autonomous home learning. Several wiki-based tasks were designed to support learning competences as defined in the school curriculum, which include several sub-categories: wiki as a learning environment, evaluating and self-evaluating skills, cooperation, and creativity. Thus, the following research questions were defined:

1) Do students use wiki materials for their learning?

2) Do students consider doing tasks on a wiki as an important part of their learning?

3) Do students think that their evaluating and self-evaluating skills are improved by working on wiki tasks?

4) Does working on a wiki support their creativity?

5) Does working on a wiki enable them to use different sources for self-expressing?

6) Does working on a wiki make them cooperative?

7) Do students think that team working on a wiki support their learning?

Research sample and methodology

The pedagogical experiment was carried out at the Secondary School for EU Administration (SSEUA), Prague, Czech Republic. The school has more than 800 students. To support meaningful communication in English and enhance English communication skills, one class of 29 students (at the age of 16 – 17) was taught Social Science in CLIL (the experimental group), whereas in the second class of 30 students other than CLIL methods were applied (the control group). Both classes were supported by the use of a wiki environment. The students were exposed to one a 45-minute lesson a week during the school year 2013/14, totally 32 hours per year. In both groups the students were divided into ten groups of three students for the whole course. During the course students worked both individually and in teams. They were also assessed individually or collectively depending on given tasks. Each student had unlimited access to learning materials, provided by the teacher, which were displayed on the wiki and class collaborative web pages. The team web pages and student's portfolio page were accessed only to the members of each group.

The teaching and learning processes were designed both to promote maximum communication and to enhance learning competences. The whole process consists of three stages. The first stage includes presenting new knowledge or information to students by the teacher with the help of the wiki platform, a text-analysing activity or an expert group activity. This stage refers to Neo-behaviourism (Zounek and Sudický, 2012) where the teacher is a guarantee of transferring basic knowledge to students, so that they are able to gain an insight into the whole issue.

The second stage represents active learning (Constructivism) (Zounek and Sudický, 2012). Students are responsible for seeing the issues in context and developing their own experience. This stage is structured into two phases. In the school phase students work in pairs or teams on activities which encourage them to use general classroom communication skills as well as learn

or practise one sub-competence from learning competences e.g. they solve higher cognitive tasks, plan, organise and check outcomes of their projects or take notes from different media sources. Within the home phase, the students from both groups work in the wiki environment. Each student has their own portfolio page, where they submit their homework, usually based on a concept of comparing ready-known information (pre-concept) with "just-learnt" information or give an opinion on related issues. The wiki-based home tasks try to reflect the preferences of student's learning style. The students in both groups are asked to choose at least one of the three tasks, which might include activities based on visual, auditory, verbal or logical modality. The students give a short assessment or self-assessment on a current learning issue and their performance during a lesson. This should help them to improve their functional language for class purposes as well as to extend their learning competences. In the experimental group the wiki-based activities are in English and the students are encouraged to use for communication only English language.

The third stage deals with creating student's own learning space/environment via the Internet. This process refers to Connectivism, where a network of connections helps to distribute knowledge and that is the reason why learning gains the power to construct and exceed those networks (Downes, 2012), which supports the idea of creating learning groups on the Internet. Students work in teams of three students on a team/collaborative wiki page. The whole team contributes to their page after each lesson. Students should post their reflection on a lesson as well as they should add some materials concerning their interests or needs. The team members can see each other portfolio pages, so that they can be inspired while working on their tasks at home. They comment team member's contributions and react to their comments. They summarise the team's contributions and evaluate their team approach. The whole communication is supervised by the teacher, who posts their own comment and assesses the content of the page from subject-content and in the experimental group as well as from the foreign language points of view. This supervision should help students stay focused on learning and develop not only academic and general functional language, but also to learn how to work in teams or look up additional materials on the Internet. Last but not least, students have to manage their learning and accomplish tasks on a wiki to a pre-defined deadline.

Research findings

Reflecting the teacher's subjective feedback the analyses of team and portfolio pages, plus post-course questionnaires as well as the focus-group discussion show that wiki-based tasks might develop student's learning competences. This conclusion was based on a partial subjective qualitative analysis, not published yet, but it served as the background of further steps.

To measure perceived students approaches to wiki-based tasks, the students completed a post-course questionnaire, which consists of 30 items scored on a six-point Likert scale from 1 meaning 'I strongly agree with this item' to 6 expressing 'I strongly disagree with this item'. All displayed questions in Table 1 are selected from 30 items divided into three groups (general learning skills, cooperation/collaboration and wiki environment).

QUESTIONS	YES answer (%) 59 respondents	YES answers (%) 29 CLIL respondents	YES answer (%) 30 no CLIL respondents
1. Do students use wiki materials for their learning?	56 (95%)	28 (97%)	28 (93%)
2. Do students consider doing tasks on a wiki as an important part of their learning?	45 (76%)	24 (83%)	21 (70%)
3. Do students think that their evaluating and self-evaluating skills are improved by working on wiki tasks?	39 (66%)	20 (69%)	19 (63%)
4. Does working on a wiki support their creativity?	44 (75%)	25 (86%)	19 (63%)
5. Does working on a wiki enable them to use different sources for self-expressing?	48 (81%)	26 (90%)	22 (73%)
6. Does working on a wiki make them cooperative?	53 (90%)	27 (93%)	26 (87%)
7. Do students think that team working on a wiki support their learning?	36 (61%)	16 (55%)	20 (67%)

Tab. 1: Summary of respondents' attitudes

To make the data clearer, in Table 2 the students' attitudes are interpreted by using the basic descriptive statistics. Evaluation criteria are described below:

- 1.00–1.50 means that the students had very positive attitudes toward a wiki.

- 1.51–2.50 means that the students had positive attitudes toward a wiki.

- 2.51–3.50 means that the students had partially positive attitudes toward a wiki.

- 3.51–4.50 means that the students had partially negative attitudes toward a wiki.

- 4.51–5.50 means that the students had negative attitudes toward a wiki.

- 5.51–6.00 means that the students had very negative attitudes toward a wiki.

QUESTIONS	29 CLIL respondents				30 no CLIL respondents			
	Mean	S.D.	Var.	Mode	Mean	S.D.	Var.	Mode

1.	Do students use wiki materials for their learning?	**2.10**	**1.11**	**1.22**	**2**	**2.03**	**0.98**	**0.97**	**2**
2.	Do students consider doing tasks on a wiki as an important part of their learning?	3.06	0.68	0.46	3	3.23	1.20	1.45	3
3.	Do students think that their evaluating and self-evaluating skills are improved by working on wiki tasks?	3.20	1.08	1.13	3	3.13	1.09	1.18	3
4.	Does working on a wiki support their creativity?	2.77	1.23	1.51	2	3.33	1.19	1.42	3
5.	Does working on a wiki enable them to use different sources for self-expressing?	2.53	1.03	1.05	2	2.70	1.19	1.41	2
6.	Does working on a wiki make them cooperative?	2.27	0.93	0.86	2	2.43	1.09	1.18	2
7.	Do students think that team working on a wiki support their learning?	3.53	1.23	1.51	3	3.4	1.05	1.12	**3**

Tab. 2: Summary of descriptive statistics

From all of the above, it can be said, that more than 75 % students consider wiki-based tasks important for their learning and more than 90 % students used displayed materials on a wiki for their learning. It is similar to Su and Beaumont (2010) results who found about 59 % students perceived that R&D wiki helped to develop their initiative in learning independently. More than 70 % students stated that a wiki supports their creativity and promote different ways of expressing themselves. Implementing wiki environment into lessons had an impact on about 88 % of students' cooperation, and 60 % of them think that cooperation on a wiki had an impact on their learning. Similarly to Kam, Katerattanakul (2014) whose study reveals that synchronicity and group-awareness promote team-based learning. Although the students expressed the positive impact of a wiki on their learning, the impact on their cooperation and collaboration is ambiguous, which can be clearly seen in Tables 3 and 4.

Table 3 shows responds to respondents' overall attitudes to wiki environment. The questions are taken from the above mentioned post-course questionnaire.

QUESTIONS	YES answer (%) 59 respondents	YES answers (%) 29 CLIL respondents	YES answer (%) 30 no CLIL respondents
1. Do students consider wiki-based learning interesting?	48 (81%)	26 (90%)	22 (73%)
2. Do students want to carry on working on a wiki?	39 (66%)	23 (79%)	16 (53%)

Tab. 3: Summary of respondents' overall attitude to wiki environment.

Table 4 shows the students' attitudes interpreted by using the basic descriptive statistics. Evaluation criteria have already been described above:

QUESTIONS	29 CLIL respondents				30 no CLIL respondents			
	Mean	S.D.	Var.	Mode	Mean	S.D.	Var.	Mode
1. Do students use wiki materials for their learning?	**2.77**	**0.72**	**0.51**	**3**	**3.03**	**1.33**	**1.77**	**3**
2. Do students consider doing tasks on a wiki as an important part of their learning?	2.70	0.9é	0.81	2	3.50	1.63	2.65	2

Tab. 4: Students' attitudes.

Table 3 outlines the answers to the research problem if wiki environment can support learning competences. More than 80 % students find wiki-based learning interesting. This attitude is supported by focus – group discussions, where students expressed their motivation to learn new technology or do new things. Surprisingly, this motivation was gradually wearing off in no CLIL group (the control group), but not in CLIL group (the experimental group), although both groups did the same wiki-based tasks. The difference was mainly in working language and extra Internet materials (podcasts, clips, videos, resources etc.) which are in English and rarely in Czech. The next reason for worn off motivation was setting a deadline, which was for a few students frustrating. In both groups were students who do not find not only wiki environment, but also the whole idea of learning anything by means of Internet contributory. These conclusions reflect the difference between 79 % CLIL students who want to have more CLIL subjects to 53 % no-CLIL students.

Discussions and conclusions

This study explored the pedagogical implications arising from the integration of a wiki into an existing curriculum of a subject in Social Science. The research problem of the study was: "Can a wiki environment support learning competences?"

First of all, we discussed the construct of learning competences. Reflecting the set criteria for learning competences, which students in Czech higher second education should reach, we focused on cooperation, evaluation and self-evaluation, and learning skills. We tried to implement a few wiki-based tasks dealing with learning competences into a running experiment on a wiki. Consistently with a previous researches (Hewege and Perrera, 2013), findings of this study may shed light on how wiki tools might support learning competences within collaborative learning.

The students most appreciate the fact that they can express themselves in many different ways (graphs, mind maps, pictures, videos etc.), which might reflect their learning styles as is outlined in (Šimonová and Poulová, 2012). The students are in favour of giving feedback not only by the teacher but as well by their peers – team members. According to Schaaf, Baartman, Prins, Oosterbaan and Schaap (2013, p. 243) "feedback and reflective thinking are fundamental for learning." As we could not find any relevant studies on creativity development supported by a wiki, we suggest this area for a future research. Most students express their positive attitude to cooperating in teams on a wiki, even though sometimes it was very challenging. Although there are a few studies, e.g. Kam and Katerattanakul (2014), which consider synchronicity the most important aspect of collaborative learning, there seems to be enough studies, e.g. Coll, Rochera and de Gispert (2014), which find asynchrocity especially in self- and peer-assessment fundamental. Nevertheless, there are a few students who do not like working in teams, and they consider the whole idea of using the wiki neither motivating, nor contributory to their studies.

In conclusion it can be stated that the pre-research experiment approved the idea of implementing a wiki platform into teaching/learning process. Next step will be to specify wiki-based tasks which are predominantly focused on learning competences, and integrate them into a wiki environment. As mentioned above, learning competences are an inevitable part of school curriculum, however, there are not still fully integrated into teaching and learning process as they should be.

References

BRADLEY, Linda, Berner LINDSTRÖM and Hans RYSTEDT. Rationalities of collaboration for language learning in a wiki. *ReCALL* [online]. 2010, vol. 22, issue 02, p. 247–265 [cit. 2015-02-17]. DOI: 10.1017/s0958344010000108.

CASTAÑEDA, Daniel A. and Moon-Heum CHO. The role of wiki writing in learning Spanish grammar: Collaborative Learning in the College Classroom. *Computer Assisted Language Learning* [online]. 2013, vol. 26, issue 4, p. 334–349 [cit. 20150217]. DOI: 10.3998/dcbooks.5871848.0001.001.

COLL, César, María José ROCHERA, Ines de GISPERT, Joerg ZUMBACH, Annette HILLERS and Peter REIMANN. Supporting online collaborative learning in small groups: Teacher feedback on learning content, academic task and social participation. *Computers & Education* [online]. 2014, vol. 75, p. 86–102 [cit. 20150217]. DOI: 10.4018/978-1-59140-174-2.ch004.

CRESS, Ulrike and Joachim KIMMERLE. A systemic and cognitive view on collaborative knowledge building with wikis. *International Journal of Computer-Supported Collaborative Learning* [online]. 2008, vol. 3, issue 2, p. 105–122 [cit. 20150217]. DOI: 10.1007/s11412-007-9035-z.

DOWNES, Stephen. Connectivivism and Connective Knowledge. DOWNES, Stephen. *Www.downes.ca* [online]. 2011 [cit. 20150217]. Available from: http://www.downes.ca/post/54540

HEWEGE, Chandana Rathnasiri, Liyanage Chamila Roshani PERERA, Shailey MINOCHA and Dave ROBERTS. Pedagogical significance of wikis: towards gaining effective learning outcomes. *Journal of International Education in Business* [online]. 2013, vol. 6, issue 1, p. 97–131 [cit. 20150217]. DOI: 10.1075/bct.27.05min.

KAM, Hwee-Joo and Pairin KATERATTANAKUL. Structural model of team-based learning using Web 2.0 collaborative software. *Computers & Education* [online]. 2014, vol. 76, p. 1–12 [cit. 20150217]. DOI: 10.1016/j.compedu.2014.03.003.

KESSLER, Greg and Dawn BIKOWSKI. Developing collaborative autonomous learning abilities in computer mediated language learning: attention to meaning among students in wiki space. *Computer Assisted Language Learning* [online]. 2010, vol. 23, issue 1, p. 41–58 [cit. 20150217]. DOI: 10.1080/09588220903467335.

LARUSSON, Johann Ari and Richard ALTERMAN. Wikis to support the "collaborative" part of collaborative learning. *International Journal of Computer-Supported Collaborative Learning* [online]. 2009, vol. 4, issue 4, p. 371–402 [cit. 20150217]. DOI: 10.1007/s11412-009-9076-6.

LOKAJÍČKOVÁ, Veronika. Kompetence k učení a možnosti jejího rozvíjení a hodnocení: vymezení pojmu a přehled současných přístupů. *Pedagogická orientace*. 2013, vol. 23, issue 3, p. 318–341. DOI: 10.5817/pedor2013-3-318.

PETTY, Geoff. Teaching Students Skills. PETTY, Geoff. *Http://geoffpetty.com/for-teachers/skills/* [online]. 2015. [cit. 20150217]. Available from: http://geoffpetty.com/for-teachers/skills/

RECOMMENDATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL: on key competences for lifelong learning. In: *2006/962/ES*. 18. December 2006: Official Journal of the European Union, 2006, L 394/10. [online]. 2015. [cit. 20150217]. Available from: http://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:32006H0962&from=EN

RVP Veřejnosprávní činnost. In: *č. j. 12 698/2007-23*. MŠMT, 2007. Available from: http://zpd.nuov.cz/RVP/ML/RVP%206843M01%20Verejnospravni%20cinnost.pdf

SCHAAF, Marieke Van der, Liesbeth BAARTMAN, Frans PRINS, Anne OOSTERBAAN and Harmen SCHAAP. Feedback Dialogues That Stimulate Students' Reflective Thinking. *Scandinavian Journal of Educational Research* [online]. 2013, vol. 57, issue 3, p. 227–245 [cit. 20150217]. DOI: 10.1080/00313831.2011.628693

SU, Feng and Chris BEAUMONT. Evaluating the use of a wiki for collaborative learning. *Innovations in Education and Teaching International*. 2010, vol. 47, issue 4, p. 417–431. DOI: 10.1080/14703297.2010.518428.

ŠIMONOVÁ, Ivana and Petra POULOVÁ. *Learning style reflection within tertiary e-education.* Hradec Králové: WAMAK CZ s.r.o., 2012. 53 p. ISBN 978-80-86771-51-9.

wiki. [online]. 2014. [cit. 2014-07-12]. Available from: wikispaces.com.

ZOUNEK, Jiří and Petr SUDICKÝ. *E-learning: učení (se) s online technologiemi: Kniha s online podporou*. Praha: Wolters Kluwer, ČR, 2012. 248 p. ISBN 978-80-7357-903-6.