Research Article

Application of WIKI Platform and Collaborative Learning Model in Assisted Instruction for CET–4

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Abstract

To explore what is impact of the instruction model integrated with WIKI platform and computer collaborative learning theory on students' CET-4 grades, an instance is devised here to simulate the application of this instruction model in CET-4 learning process of students in any majors rather than English of university. First of all, this paper makes a general overview on WIKI platform and computer collaborative instruction model, then describes the design of didactical activities and function modules on WIKI platform; based on the content of courses, a contrast experiment is cited to help analyze and compare Pre-test and Post-test CET-4 grades of students as chosen in experiment class and in control class. Not only that, the application effect of WIKI platform in the university education is exposed to us after the questionnaire survey and face-to-face interviews are made on the respondents. This study results reveal the instruction effect of collaborative learning model for CET-4 under the WIKI environment, and emerges as a theoretic basis for accelerating the diversified development of university English pedagogy in China.

Keywords

WIKI Platform, Collaborative Learning • University English CET-4 • Contrast Experiment •
Pre-Test and Post-Test

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University English CET-4 is regarded as a technical indicator for assessing students about their English levels in many universities, where it is a mandatory for undergraduate to pass this CET-4 (Jiang, 2012). As a subject for examining the quality of university English pedagogy and students' learning levels, CET-4 plays a key role in university English education. The students face many pressures from learning in the university, thus an assisted English learning platform is urgently required to help them successfully pass the CET-4 (Rantavuori, 1998).

The evolution of computer network platform facilitates application of diversified types of automated instruction platform in English pedagogy in some universities: some scholars have built English instruction platform based on B/S architecture in c #; some universities have also constructed the remote education platform based on Moodle for English major. Additionally, the computer-aided instruction and the English corpus have been sprung up (Jia, 2009). Some problems, however, emerge in current Web-based English education of universities: the platform technology bottleneck, divergence of students' discussions from learning courses, not dynamically updated and expanded learning resources, ignorance of changes in student's learning behavior and attitude, lack of well-designed didactical activities. The Web2.0 provides a universal platform for more and more Web-based learning applications (Xu & Yang, 2011) just like WIKI platform which supports some pedagogical activities and improves the learners' interaction skills. A practice study shows that the WIKI has effectively met many challenges pertaining to network platform technology, learning resources and collaborative construction (Tsai, Li, Elston & Chen, 2011).

In order to help students successfully pass the CET-4, this paper proposes a Wiki-based computer collaborative learning model for CET-4. In this paper, the WIKI platform and the computer collaborative learning model are expounded firstly. Then, the CET-4 collaborative learning platform is built up based on the designs for pedagogical activity and learning modules (Mika, Ciaramita, Zaragoza & Atserias, 2008). In the end, the application effect of CET-4 collaborative learning model based on WIKI platform is evaluated in a quantitative and qualitative ways by contrast experiment with questionnaire survey. The collaborative instruction model based on WIKI platform has effectively improved the interactivity and enriched teaching content in English major. With the application study, this model has been proven to be effective in improving students' CET-4 pass rate.

Literature Review

Overview of collaborative learning definition

Ellis and Fauci, the contemporary American famous education reviewers, stated in their book *The Research on Education Reform* that if collaborative learning was not the major education reforms in contemporary education, it was the least one of them". Slavin, famous educator and professor, believed that collaborative learning referred to a series of learning activities carried out by learners in groups, and class instruction technology which was rewarded and recognized based on group performance (Linden, Erkens, Schmidt &

Renshaw, 2000). Brother John from the university of Minnesota argued that collaborative learning was so defined that class instruction makes learners in groups act common activities to facilitate learning efficiency of themselves and others to the greatest extent, also pointed out some theories such as the positive interdependence, face-to-face promotive interaction, personal responsibility, social skills and team self-processing. The common characteristics of collaborative learning theory lies in the group study. It underlines the mutual development of the intergroup and the disparity between groups. The group sets the learning goals and incentive mechanism with this model, joins hands with each other to achieve the goals.

Computer supported collaborative learning (CSCL) has aroused the concern of educational researchers on account of the popularity of computer hardware. In essence, it means to use computer technology to assist and support collaborative learning process. CSCL can build an interactive platform or community in the network environment, and provide team members with Email exchange, document editing, data sharing and other functions. The learning model is not only a tool that supports learners to study, but also a platform where interactions among students, between teachers and students, and human-machine interaction can be enabled (Källström & Ljung, 2005).

Overview of WIKI platform

WIKI platform. WIKI is a hypertext system that is open on the Internet for collaborative work by many people. The WIKI is generally considered as a site with a set of Web links created by the simple markup language in order to facilitate users to freely achieve file editing and collaborate with others. WIKI features shortcut, simplicity, convenience and openness. The Apps in higher education include storing different types of electronic resources, sharing resources, monitoring group and individual progresses, promoting democratic participation, authorization of learners, and facilitating interaction and collaboration (Decker, Ras, Rech, Jaubert & Rieth, 2007).

State quo of WIKI in education. WIKI started its application in the education circle in foreign countries relatively earlier than in China. The pertinent literature focus on instructional design, platform development, practical application, effectiveness evaluation and resource management. It is found in education practices that WIKI can effectively promote the improvement of collective language skills and writing proficiency, and arouse learners' enthusiasm for learning English (Fritz *et al*., 2009). WIKI may be used as an instruction information source whereby to publish instruction information and resources; build a teacher-student learning community, carry out consultation and discussion; used as a pilot for pedagogical instruction reform; as a tool for constructing discipline knowledge; Wiki-based learning environment is suitable for developing collaborative learning models; the Wiki-based learning platform is used to build a common knowledge base for effective knowledge management (Wagner, 2004).

Inspired by the study results on the WIKI platform made in foreign countries, China also follow suit with instruction application based on the WIKI platform. As shown in Question 1, the number of literatures retrieved in CNKI with the theme of WIKI and English instruction changes constantly.

From the number of search terms with WIKI keyword in CNKI, the domestic scholars have made more and

more studies on the relationship between WIKI platform and English instruction. As a platform for improving students' learning initiative and capacity, WIKI has become increasing popular in China (Nejkovic & Tosic, 2015).
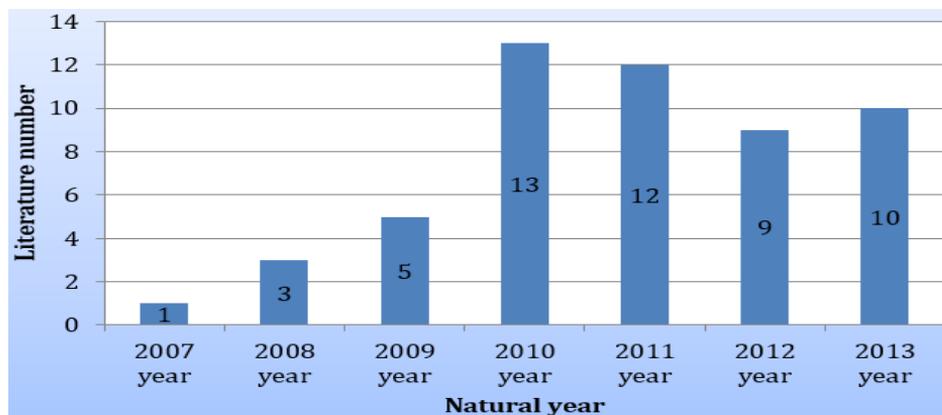

Figure 1. The searched literature number related to "wiki" in CNKI

Design of Wiki-based collaborative CET-4 instruction activities and function modules

Pedagogical activities

The pedagogical activities are designed based on the collaborative learning theory and to organize learners to learn by the ways of teams and groups. With the computer network and multimedia technology, they can effectively improve students' learning efficiency. The eight elements that underlie the design of pedagogical activities are as follows: collaborative groups, mentors, network environment, learning tasks, learning effects, assessment indicators, sharing communication and information feedback.

As shown in Figure1, the design of pedagogical activities is generally composed of the preparation, implementation and assessment and adjustment phases.

In the design of collaborative instruction activities based on the WIKI platform, the teachers play the roles of initiators, maintainers and assessors, responsible for building the platform on the threshold, dividing the students into different collaborative teams and correcting the student assignments after the pedagogical activities, and giving feedbacks and comments to students. After the cooperative team is familiar with the specific operation rules of the WIKI platform, leader, recorder, instructor, encourager and commenter are elected in each team (Kao & Chen, 2013). The network environment is a network learning platform based on the Wiki, where each member with access permission can have smooth communication and sharing of resources with others. Learning effect assessment is designed to check the outcomes of the WIKI learning platform, while students evaluate and contemplate the whole learning process and outcomes after class (Palomo-Duarte *et al.*, 2014).
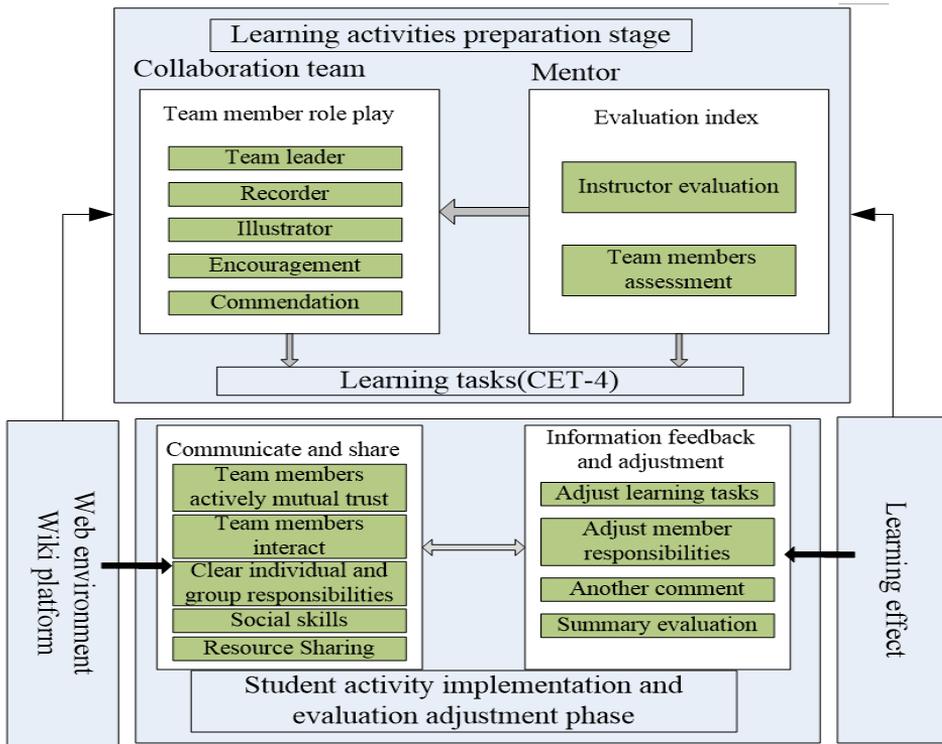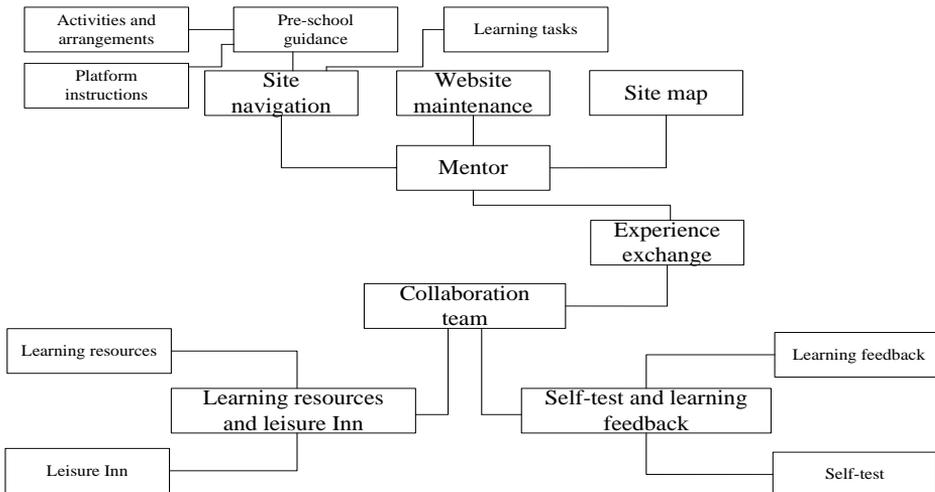
Figure 2. Activity design

Figure 3. The functional module designs

Function modules

WIKI-based CET-4 collaborative instruction platform can also be divided into different modules based on design of pedagogical activities, with which, different function will be designed. The design of function modules is shown in Figure 3.

The function modules of collaborative learning platform include website navigation, site map, learning resources, leisure Inn, self-reflection, experience exchange, website management and maintenance. Among these modules, leisure Inn, self-reflection and experience exchange are feature modules of collaborative learning based on WIKI platform, which can intrigue students 'interests in learning and improve students' English vocabularies, listening comprehension, reading, writing, translating and closing, experience exchange and other capacities in the interactive modes (Elia, Margherita & Taurino, 2009). The interface of Experience exchange is shown in Figure 4.
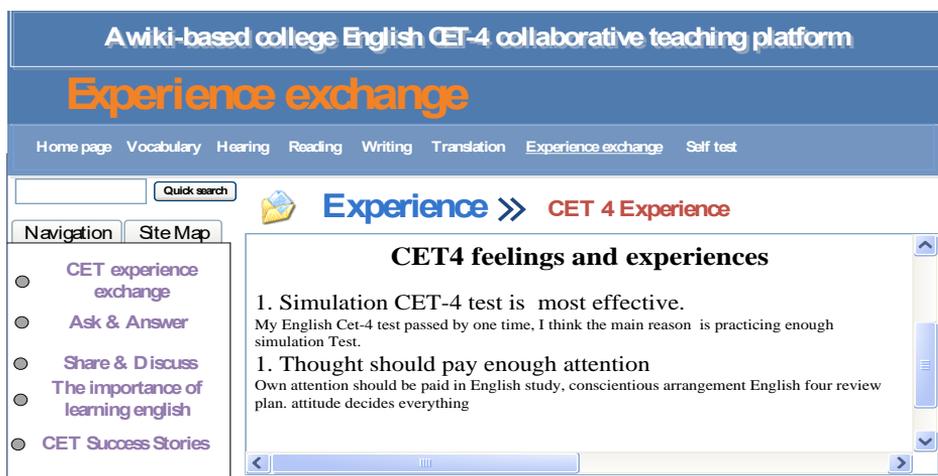
Figure 4. Experience exchange interface screen shot

In Experience exchange interface, communications can be made between team members, team and team, team and teachers for exchanging and sharing feelings and experiences gained during the CET-4, building up learning self-confidence and competence with mutual communication and encouragement, and indirectly improving the CET-4 grades.

Empirical Study on the Effect of the Wiki-based CET-4 Collaborative Learning Platform

To validate the effect of the platform, based on the design of pedagogical activities, students in non-English

majors from a university are chosen to conduct experiments on instruction comparation, and analyze the instruction effects by Pre-test and Post-test and by questionnaire survey.

FAQ

Is the collaborative learning mode based on WIKI platform better to help students improve the CET-4 pass rate than the traditional learning model?

In what skills can the WIKI collaborative learning model be more helpful for students to improve their English grades?

How well do students grasp the Wiki-based collaborative instruction model and what is attitude of them toward it?

Settings of methodologies

Study objects. In this study, 60 freshmen in non-English majors in a university in Changsha city, China, were randomly chosen as experiment objects: 30 in control group, for whom, the traditional instruction model is adopted; 30 in the experiment group, for whom, the collaborative instruction model based on WIKI platform is used. There are 6 teams, and 5 students each.

Instruction design. 60 students are tested for their English grades before experiment. In this paper, the learner's English final exam grades in previous semester are taken as their Pre-test grades; the teaching cycle is designed as a semester. Students of experiment group in the teaching cycle start to learn the pedagogical activities as designed in the previous section on the WIKI platform. At the end of the teaching cycle, the students of experiment and control groups are tested for their English grades, and the SPSS software is used to count up their Pre-test and post-experiment English grades for easy study and analysis.

Interviews and questionnaire survey. The questionnaire survey focuses on the impact of WIKI platform on learners 'self-efficacy and learners' attitudes towards WIKI instruction platform. It includes five scale levels, i.e. "Strongly disagree", "Disagree", "Not sure", "Agree" and "Completely agree". The purpose of the interviews is to investigate the subjective feelings of experiment group, collaborative group students and teachers involved in the application of the WIKI platform, and then count up the advantages and disadvantages of the WIKI platform.

Analysis and discussion on comparison results from instruction experiment

Pre-test grades. The final grades in the last semester are taken as Pre-test outcomes, refer to CET-4 Annual Tests for final exam propositions, to survey whether the English levels of Pre-test and post-test students are equivalent. A comparison of Pre-test grades is shown in Table 1, and an independent sample T test is conducted for students' grades in listening, comprehending, writing, reading competences.

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Table 1
The Pre-test Grade of Test Group and Control Group

	Group type	**N**	**M**	**SD**	**t**	**p**
Total score	Test group	30	390.33	32.204	0.991	0.940
	Control group	30	390.97	32.383		
Listening	Test group	30	127.47	19.839	0.516	0.973
	Control group	30	127.63	17.641		
Compositive	Test group	30	39.60	5.354	0.141	0.895
	Control group	30	39.80	6.299		
Writing	Test group	30	78.23	8.245	0.493	0.665
	Control group	30	79.13	7.763		
Reading	Test group	30	144.57	14.825	0.645	0.715
	Control group	30	143.17	14.746		

It can be seen from the table that there is no significant disparity between the students in the experiment and control groups in the terms of comprehending, listening and reading, writing competences compared with the total grades of English Pre-test, which shows that the experiment is operable and comparable.

Comparison between Pre-test and Post-test grades. For Post-test grades, CET 4 in June 2017 that the experiment and control group students participated was taken as a reference. The comparison results are shown in Table 2.

Table 2
The Pre-test and Post-test grade Comparison of Test Group and Control Group

Group		**Min**	**Max**	**M**	**SD**	**t**	**P**
Test group	Pre-test	328	458	390.33	32.204	0.505	0.001
	Post-test	383	543	456.10	46.494		
Control group	Pre-test	325	457	390.97	32.383	0.220	0.002
	Post-test	342	532	428.90	55.094		

In above Table, *Min* represents the minimum of test grade; *Max* represents the maximum value of test grade; *M* is the average value; *SD* is the variance, *t* is the significance level; *p* is the significance level of the double tests. It can be seen from the table that the total grade of experiment group reaches 16.85% at improvement rate, that is, from 390 points to 456 points, the lowest grade also increased by 55 points; compared with the control group, the average rate of improvement is only 9%. There is a significant difference in the CET-4 grades of the experiment group, so does the comparisons of listening, writing, reading, comprehending and other individual grades. Therefore, the quantitative study has verified the availability of Wiki-based collaborative learning model.

Analysis of results from interviews and questionnaire survey

Self-efficacy of WIKI in experiment group. Students who are familiar with the WIKI instruction resources and have a positive impact on their English academic records will improve their self-efficacy in learning process. The results from a survey conducted on self-efficacy of students are given in Table 3.

It can be seen from the table that 53.34% of the experiment group students think the WIKI platform is easy to operate. More than 66.7% of the students know how to apply the WIKI platform for uploading the resources. Over 76.67% of the students know how to communicate with their peers on the platform. The results from

questionnaire survey show that the overall self-efficacy of experiment group students on WIKI platform is good. Students can successfully accomplish the relevant learning tasks on the platform.

Table 3
The Student Self-Efficacy Survey by Using WIKI

Question	1 Very inconsistent		2 Inconsistent		3 General		4 Consistent		5 Very consistent	
	N	%	N	%	N	%	N	%	N	%
Do you think easy to use wikis?	1	3.33	4	13.33	8	26.67	11	36.67	5	16.67
Do you know how to paste a job in the WIKI group?	1	3.33	3	10	3	10	11	36.37	13	43.33
Do you know how to upload resources on the wiki?	1	3.33	2	6.67	7	23.33	9	30	11	36.67
You know how to communicate with parters on the wiki	0	0	3	10	6	20	11	36.67	12	40

Attitude of experiment students toward the WIKI platform. The survey results reveal that 56.66% of learners think that WIKI can help them accomplish their learning tasks better. It means that learners can get help from all sides by the ways of the communication and exchange with peers and teachers on the WIKI platform, thus improving the completion rate of students' homework. The WIKI platform not only improve the collaborative learning awareness of group members but also enhances the collaborative learning competence. Students' capabilities to process English learning information are further improved by WIKI instruction platform. 56.66% of students believe that their English proficiency is attained through learning on the WIKI platform.

Table 4
The Student's Attitude Towards WIKI

Question	1 Very inconsistent		2 Inconsistent		3 General		4 Consistent		5 Very consistent	
	N	%	N	%	N	%	N	%	N	%
You think WIKI do a better job of learning tasks	2	6.67	3	10	8	26.67	13	43.33	4	13.33
You think WIKI can promote learning among teams	1	3.33	2	6.67	5	16.67	13	43.33	9	30
English based on the WIKI to improve your information processing skills	1	3.33	2	6.67	12	40	10	33.33	5	36.67
English based on the WIKI to improve your English proficiency	2	6.67	3	10	8	26.67	13	43.33	4	13.33

Interview results. After the experiment, the students in the experiment group are organized for face-to-face interviews. The advantages of WIKI collaborative instruction model are recorded as follows: 1.WIKI is easy to operate; 2.WIKI resources are conducive to students' accomplishing homework and learning; 3. Interaction with companions by WIKI is helpful for students to finish the tasks; 4.WIKI can help students learn from each

other by observation; 5. Participants on WIKI platform can comment and modify the works of others and express their views in the forum; 6. Each member on the WIKI will be able to complete their respective roles; 7.WIKI platform enables students to improve their English proficiency.

It is concluded by analysis that the collaborative instruction model based on the WIKI platform can intrigue students' interests in learning English more than the traditional ones. It is proved by the quantitative and qualitative analysis that this instruction model plays a positive effect on the students' English proficiency.

Conclusions

For the purpose of improving students' CET - 4 pass rate, this paper proposes a collaborative instruction model based on WIKI platform which has been proven to be effective in the instruction by experiments and questionnaire survey interviews. The primary tasks and research significance of this paper are defined as follows:

(1) The pedagogical activities and the function modules of the platform are designed in detail, which is in favor of better coaching for CET-4.

(2) With comparative analysis of pre-test and post-test grades of CET-4, by combination with questionnaire survey and interviews, it is concluded that the proposed English instruction model is more effective than the traditional one.

(3) This study plays a great instructive significance for counselling students to improve their CET-4 pass rate and further intriguing their English learning interest and self-efficacy.

References

Decker, B., Ras, E., Rech, J., Jaubert, P., & Rieth, M. (2007). Wiki-based stakeholder participation in requirements engineering. *IEEE Software, 24*(2), 28-35. http://dx.doi.org/10.1109/ms.2007.60

Elia, G., Margherita, A., & Taurino, C. (2009). Enhancing managerial competencies through a wiki-learning space. *International Journal of Continuing Engineering Education and Life-Long Learning, 19*(2-3), 166-178. http://dx.doi.org/10.1504/ijceell.2009.025025

Fritz, S., Mccallum, I., Schill, C., Perger, C., Grillmayer, R., & Achard, F. (2009). Geo-wiki.org: The use of crowdsourcing to improve global land cover. *Remote Sensing, 1*(3), 345-354. http://dx.doi.org/10.3390/rs1030345

Jia, J. (2009). CSIEC: A computer assisted English learning chatbot based on textual knowledge and reasoning. *Knowledge-Based Systems, 22*(4), 249-255. http://dx.doi.org/10.1016/j.knosys.2008.09.001

Jiang, Q. (2012). Prediction on time series analysis of cet-4 pass rate. *International Conference on System of*

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Systems Engineering (SoSE), 428 - 431 http://dx.doi.org/10.1109/sysose.2012.6333523

Källström, H. N., & Ljung, M. (2005). Social sustainability and collaborative learning. *Ambio, 34*(4-5), 376. http://dx.doi.org/10.1579/0044-7447(2005)034[0376:ssacl]2.0.co;2

Kao, B. C., & Chen, Y. H. (2013). A wiki-based assessment system towards social-empowered collaborative learning environment. *Lecture Notes in Electrical Engineering, 240*, 633-640. http://dx.doi.org/10.1007/978-94-007-6738-6_78

Linden, J. V. D., Erkens, G., Schmidt, H., & Renshaw, P. (2000). Collaborative learning. *Medical Education, 37*(9), 758.

Mika, P., Ciaramita, M., Zaragoza, H., & Atserias, J. (2008). Jordi Atserias. 2008. learning to tag and tagging to learn: A case study on Wikipedia. *IEEE Intelligent Systems, 23*(5), 26-33.

Nejkovic, V., & Tosic, M. (2015). WIKI learning system patterns for academic courses. *Computer Applications in Engineering Education, 22*(4), 678-685. http://dx.doi.org/10.1002/cae.21559

Palomo-Duarte, M., Dodero, J. M., García-Domínguez, A., Neira-Ayuso, P., Sales-Montes, N., & Medina-Bulo, I. (2014). Scalability of assessments of wiki-based learning experiences in higher education. *Computers in Human Behavior, 31(1)*, 638-650. http://dx.doi.org/10.1016/j.chb.2013.07.033

Rantavuori, R. (1998). Learning the do-auxiliary: an experimental research of two teaching approaches. *Revue Neurologique, 95*(3), 218-28.

Tsai, W. T., Li, W., Elston, J., & Chen, Y. (2011). Collaborative learning using WIKI web sites for computer science undergraduate education: A case study. *IEEE Transactions on Education, 54*(1), 114-124. http://dx.doi.org/10.1109/te.2010.2046491

Wagner, C. (2004). Wiki: A technology for conversational knowledge management and group collaboration. *Communications of the Association for Information Systems, 13(*9), 265-289.

Xu, S., & Yang, X. (2011). The influences of age factor on students' English learning strategies in autonomy learning. *International Conference on E-Business and E-Government, ICEE2011*, 8441-8443. IEEE. http://dx.doi.org/10.1109/icebeg.2011.5887216