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Effectiveness of a Wikis-Based Applied Linguistics Course on Learning Outcomes and Attitudes towards the Course

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Abstract- This study aimed to check the effectiveness of wikis in terms of students' learning outcomes in an Applied Linguistics II course for EFL college students as well as to investigate their attitudes towards the course content while elearning via the use of Wikis. The researcher employed an experimental pretest/posttest control group design to check the effects of using wikis on learning outcomes and the learners' attitudes. Results showed that there existed statistically significant differences between the research groups, which mean the experimental group applying wikis performed better in the designated course than the control group. Additionally, when compared with the non-wiki group, the wiki group had a more favorable attitude towards the wikisbased course. The paper ends with implications for pedagogy and e-learning environments. Finally, recommendations for further research are given.

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I. Introduction

Over the last decade up to the present time, e-learning has become an established educational delivery platform with the burgeoning of e-learning management systems (LMSs) such as Blackboard. Facilities and tools built in the infrastructure of LMSshave been developed, deployed to provide opportunities for computer supportedknowledge exchange (Cress&Kimmerle, 2007; 2008; Kimmerle, Cress, &Hesse, 2007; Mekheimer, 2012), as well as forcomputer-assisted learning and collaborative knowledge building (Bryant, 2006; Fageeh, 2011; Scardamalia and Bereiter, 2003).

Of late, collaborative learning over the Internet has given birth to what is called "social software" (Kolbitsch& Maurer, 2006). These are computer-based communicative learning technologies that support peoplein communicating, interacting, and collaborating in the Internet community. An off-shoot of this social software is the development of the Online Encyclopedia, widely known as Wikipedia (Goldspink, 2010). The applications of social software tools have not only invaded the area of informatics only, but the impact of social software also extended to the field of education. Educators are now utilizing social software tools in educational contexts as well (Evans, 2008; Forte &Bruckman, 2006; Kim,2008; Kimmerle, Cress, & Held, 2010), given their influential potential for purposes of knowledge building and learning both in formal and informal educational situations (Bryant, 2006; Parker & Chao, 2007; Wang & Turner, 2004).

By definition, a wiki is a website which allows people to add, modify, or delete the content via a web browser usually using a simplified markup language or a rich-text editor (Wikipedia, 2013). Wikis are usually created collaboratively by Internet communities using special wiki software, or over intranets via collaboration of individual, volunteer anonymous authors (Ebersbach, Glaser &Heigl, 2008; Leuf, 2001), for content is emphasized over authorship (Wei, Maust, Barrick, Cuddigy, &Spyridakis, 2005).Other researchers defined a wiki as a "freely expandable collection of interlinked web pages, a hypertext system for storing and modifying information – a database, where each pageis easily edited by any user with a forms-capable Web browser client" (Leuf &Cunningham, 2001, p.14).Wikis, therefore, present a potential language learning resource which helps in collectivelyproducing, organizing and sustaining textual (and, increasingly, visual and auditory)resources.

In educational settings, wikis are now looked upon as potentially useful online tools that can be supportive of collaborative activities, and thus can be used for improving student interactions in e-learning and CMC milieus at all levels of education from primary to tertiary (Beldarrain, 2006; Boulos, Maramba & Wheeler, 2006; Chen, 2008; Cubric, 2007; Collier, 2010; Chen, Lambert & Kevin, 2010; Hadjerrouit, 2010; Désilets & Paquet, 2005; Hazari, North & Moreland, 2009; Kokkinaki, 2008).

Wikis are used to allow all interested individuals to create and edit web pages in a fashion that promotes collaborative content creation and editing and empower them with a sense of responsibility, ownership and authority in wiki writing (Bold, 2006;Goodwin-Jones, 2003;Raitman, Augar, & Zhou, 2005; Tonkin, 2005). Research findings and implications for the pedagogical uses of wikis indicate that wiki tools provide user-friendly interfaces flexible enough to allow for collaborative content editing, knowledge building, knowledge archiving and online interaction which can be useful for developing and improving reading and writing skills, academic writing skills and content-based learning

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(Campbell & Ellingson, 2010; Farabaugh, 2007; Hadjerrouit, 2012; Kimmerle, Moskaliuk, & Cress, 2011; Lund, 2008; Raygan& Green, 2002; Schwartz, Clark, Cossarin, & Rudolph, 2004;Wichadee, 2010).

Available literature refers to a well-established technical and pedagogical usability of wikis (Anderman andDawson, 2011; Chao and Lo, 2009; Chen, 2008; Hadjerrouit, 2010; Hazari et al., 2008; Leacok and Nesbit, 2007; Lund &Smørdal, 2006; Mattison, 2003; Mindel and Verma, 2006; Nielsen, 2000; Nokelainen, 2006). According to prior research findings and experience-based theory, technical and pedagogical usability of wikis are applicable in the following properties of wikis:

Ease-of-use: It is easy to read the content of a wikiand its linked figures, images, and illustrations.

Efficiency: Wikis can be developed, improved and expanded on in less time and with less efforts for the intended task or purpose a wiki may be used for.

Technical design: This propertyrefers to the features that wikisexhibit in terms of page structuring, insertion of images, tables, illustrations and other media.

Accessibility and navigability: It is easy to access thewiki, and navigate through its pages.

Added value: Wikis can scaffold collaborative learning and writing in comparison to traditional technologiessuch as text processing systems. The added value of wikis alsolies in their openness, ease-of-use, discussion forum, and assessment of students' contributions to the wiki.

Motivation: Internal motivation is a function of the value placed on the wiki, and the amount of efforts a student is willing to invest in working with it. The motivation increases when the wiki is inherently enjoyable and contain intrinsically information that has a highly value for the student. External motivation refers to motivation that comes from outside a student performing wiki tasks in order tobenefit from them, e.g., passing an exam.

Differentiation: This property is used to adapt wikis to the users' needs. It involvesfitting the wiki to the characteristics of the users, e.g., age, gender, preferences, language, and prior knowledge. Differentiation is important to attract potential users interested in the wiki. Knowing that there might be an audience for their wiki motives students to develop well-structured wiki pages using a clear and understandable language.

Collaboration: The very nature of wikis lies in their potentialities to support collaborationamong participants. True collaboration requires one student to modify the content posted by another student and re-working the writing of others. In contrast, collaboration may occur at a lower level, when a student simply adds content to an existing wiki page. Genuine collaboration requires that all participants contribute to all aspects of the wiki application: content, structure and language.

Discussion: This property describes the way and the extent to which the wiki is used for discussion and communication. Basically, the wiki discussion page is usedas a space for communication among participants. It can be used to discuss differentaspects of the wiki tasks. It may also be used to transform and improve the tool to a better instrument for collaboration and coordination, for example adding the date of contribution and name of contributor.

Assessment: The assessment property is important for evaluating students' contributionsto the wiki. Of particular interest is the data log of Media Wiki that tracksactivity and stores previous versions of the wikis by observing who is active, and when, the type of activities, etc. The log permits the assessment of students' contributionsin terms of collaborative activities performed on the wiki, level of contribution, timing and work intervals.

Peer-review and feedback: In addition to collaborative activities within their own group, students need to benefit from comments and feedback received from other groups. Peer review needs to be well-organized and structured in terms of content and issues in order to be beneficial to the students. Peer review is also important from the point of view of academic writing.

However, paucity in experimental research studies that support the effect of applying wikis to learning can be easily recognized in searching specialized databases or any open access research engines. Specifically in language education, there is noted dearth in research the effects of using wiki technology in EFL college courses. Recently, wikis hold a rapidly and increasingly used language medium, but there is a need for studies that address their use in education and how they can be utilized in school subjects (Lund & Smørdal, 200). Therefore, this study has been designed to glean empirical data to explore the effectiveness of wikis in improving achievement and attitudes towards a college course.

II. Research Design and Methods

The study was designed to evaluate the effect of a wiki in the classroom from both a student's perspective as well as an educator's perspective, and how using this technology may affect a students' learning experience. This study occurred at a College of Languages & Translation in a South-western region in Saudi Arabia. The participants of the study were students enrolled in a 12-week Applied Linguistics course. The study intended to answer the following questions:

1. Did using this Wiki technology aid in the student's learning experience, the student's engagement in the classroom, or the student learning outcomes?

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2. Did students feel using the Wiki technology was useful in guiding their learning experiences to make them more independent learners?
3. Did students gain higher-level thinking and step outside of the required curricula by expanding upon their own knowledge with broad topic areas by using this Wiki technology?
4. Did the use of this Wiki technology, aid in the student's learning outcomes, through observation and collaboration with their peers?
5. What impressions do other educators have when using wikis in the classroom.

The role of the researchers in implementing this innovation has been one of a facilitator rather than the sole expert. The researchers tried to balance 'teacher control' and 'learner activity' as Van Lier suggests that every student should be given a realistic chance of success and challenges by a series of choices. In addition the philosophy underlying this innovation has been that language not only determines what we can say but also what we can think, echoing Vygotsky's idea that in acquiring a language, students "gain a tool for thinking" and "When learners learn a language ... they are learning the foundations of learning itself" (Halliday, 1993, p 93).

For greater reliability and validity, data triangulation was achieved by including both quantitative and qualitative data. The quantitative evidence is in the form of an achievement test tapping into the skills of writing and reading, together with an attitude questionnaire for the students about their perceptions of learning with wikis. Teachers' diary and interviews form the qualitative evidence were also explored. Qualitative data was collected after the tutor pointed out that validity of the study may be increased by including evidence from the teachers of the Applied Linguistics course.

T-tests and gain scores were used to compare students' performance on all skills in both the experimental and control groups. Improvement (or gain in achievement or skill acquisition and development) from pretest to posttest can be computed for each participant by subtracting each person's pretest score from his or her posttest score (Gain score = posttest – pretest). The gain score controls for individual differences in pretest scores by measuring the posttest score relative to the each person's pretest score.

III. Participants

Students enrolled in the course had various backgrounds of using the computer, especially for e-learning purposes as well as using Blackboard as the main LMS in King Khalid University. All students knew copiously about using the learning management system (LMS) of Blackboard applications, including wikis as a feature of Blackboard tools. The research was introduced during the first week of instruction, to give students an opportunity to learn basic wiki development skills. Students were provided an explanation of this research and given the option of exclusion from participation in this study.

The study involved an analysis of the performance of two groups of students. The experimental group (27 students)) was taught the skills of reading and writing in an integrated content approach of instruction. The control group (25 students) completed the same course with no particular emphasis on skill integration through wiki building. The two groups were actually two sections assigned to the researchers for teaching Applied Linguistics-II.

a) Hypotheses

This study was designed to test the following null hypotheses ($p \leq 0.01$):

1. There are no statistically significant differences between the mean scores of students in the skills of reading and writing in the experimental and control groups on pretesting (to ensure group equivalence).
2. There are statistically significant differences between the mean scores of language skills of students who have completed wiki-based Applied Linguistics course according to an integrated content wiki-based approach and the mean scores of the students who have participated in the same course with no systematic integration of wikis on post-testing in favour of post-treatment.
3. There are statistically significant differences between the experimental and the control students in their gain scores on all skills in favour of post-treatment.
4. Students' attitudes towards wiki-based learning improved in the experimental group compared with pretesting and with posttesting as compared with the control participants.

IV. Results

Data were collected from pretesting and posttreatment testing, and analysed by means of t-tests, run by the Statistical Package of Social Sciences (SPSS), version 14.

Hypothesis I: Group Equivalence

To test the first null hypothesis in order to make sure that they began the experiment at comparatively similar levels of skills, a t-test was computed to reassure group equivalence; the obtained t-values and their significance levels are shown in (Table 1) below.

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Table 1 : Group Equivalence as Measured by All Skills Pretesting

Skills	Group	N	Mean	SD	*t-value*	Sig.
Reading	Exp	27	22.440	73598.	0.0534	0.955
	Cont	25	22.33	74776.		
Writing	Exp	27	25.42	1.34699	0.0131	0.901
	Cont	25	25.43	1.40888		

The table above demonstrates that there were no statistically significant differences between the experimental and control groups on pre-assessment. In this way, the first hypothesis was verified, and group equivalence was confirmed.

The other hypotheses of interest are related to the study variables intended to measure students' levels of achievement in the content area, using an integrated language skills test that tapped into the reading comprehension, and writing skills of the students as a result of integrated skills content instruction into an Applied Linguistics course. These dependent measures were obtained after all students, in both the experimental and the control groups, had completed the set course with an integrated skills pedagogy using wikis in the experimental group and traditional teaching of the course in the control group.

Hypothesis II: Pre/Post-treatment Comparisons

The data presented in (Table 2) show an improvement on pretest/posttest comparisons for the intended skills; as the t-values indicate, there is a significant difference between experimental and control students ($p = 0.01$) in favour of the experimental class in the tested skills following exposure to a wiki-based integrated content instruction of the course. The second hypothesis is therefore verified.

Table 2 : Pretesting/Posttesting Comparisons of Experimental and Control Group Performances on All Skills

Skills	Group	N	Mean	SD	*t*-value	Sig.
Reading	Exp	27	69.0909	72300.	11.963	0.01
	Cont	25	66.7742	66881.		
Writing	Exp	27	84.9394	1.22320	8.837	0.01
	Cont	25	78.3871	3.63939		

Based on the results in the above table, the hypothesis suggesting that there are significant differences between both research groups on the assessed language skills in favour of the treatment group has been verified as well.

Hypothesis III: Gains in Skill Development

For differences in performance over time between the two groups, the researchers employed gain scores and the independent samples t-test to assess the effect of the treatment on all skills.

Table 3 : Findings of t-test between Experimental and Control Groups in Gain Scores

Skills	Group	N	Mean	Std. Deviation	*t*-value	Sig.
Reading	Exp	27	56.7576	1.17341	7.417	0.01
	Cont	25	40. 46	1.00952		
Writing	Exp	27	59.53	1.32574	9.100	0.01
	Cont	25	42.97	3.47835		

The statistical analysis in (Table 3) above shows a significant increase ($p < .01$) in the experimental group's gain scores as contrasted with those of the control group's participants' scores. Therefore, the third hypothesis indicating an improvement in gains between experimental participants and control participants is confirmed.

According to the results of the quantitative data which points to a significant increase ($p < .01$) in the experimental group's gain scores in comparison with those of the control group's, it is clear that the wiki-based instruction method yielded better results in the achievement of the students in Applied Linguistics as assessed by their reading and writing skills in this content area. Although both the groups showed improvement suggesting that the contents of the course are appropriate, yet the overall differences across all skills as shown in tables (2) and (3) indicate that a significant difference can be achieved by simply shifting the emphasis from teaching language skills in isolation

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to teaching them in an integrative fashion grounded in wiki-based instruction. Moreover, the most significant improvement occurred to students' writing skill, chiefly because the researchers' focus was mainly on teaching the content topics of the course, but used some of these topics as springboards for developing writing skills and reading comprehensionskills.

a) Results from the Students' Attitudes' Questionnaire

The purpose of this survey was to gain more information about how the participants in the experimental group perceived the experience of learning trough wikis and to tap into their impressions about using a wiki in the course; if the wiki promoted positive learning experiences; if group collaboration on the wiki added value to their learning experience; if students felt the wiki gave them an opportunity to become more independent learners; if participants enjoyed the wiki as a component to knowing more about their classmates; and, if using a wiki offered positive learning outcomes in the course.

When reviewing the results of the survey, 23 participants agreed that working on the group wiki project and collaborating with others added value to their learning experience. More students, 25 participants in the study, enjoyed learning about their classmates using a wiki, and also learned new things by looking at their classmates wiki pages. A limited number of students (2 participants) indicated they did not enjoy learning about classmates, and also indicated they did not learn new things from other classmates by using the wiki. Several of the study participants had also previously contributed to a wiki, approximately 11. Of the 27 participants who informed this survey, 14 students used computer technologies of the course for other classes in the semester. Of the participants, 23 felt the wiki offered positive learning outcomes for them in the course. In addition, 18 participants felt the use of the wiki gave them an opportunity to become a more independent learner, and the wiki added value in their learning during the course. Furthermore, 21 participants also felt that classes requiring the use of technology in the classroom would aid in a student's learning experience. Additionally, 11 participants felt using the wiki made them feel more creative. Further, and above all, 17 of the participants felt the wiki promoted a positive learning experience for them, while only two participants did not feel the wiki promoted positive learning. Interestingly, 18 of the participants felt that because of using the wiki, they interacted and engaged with classmates more than they would have without the wiki technology. More curiously,25 participants indicated they felt more confident in using technology tools of Blackboard after using a wiki, whereas 2 participants did not feel more confident.

b) Results from the Instructors' Survey

The purpose of this survey was to determine if other educators in various academic disciplines and levels of study used wikis in their classrooms, and if so, did they find value in using the wikis as part of their curriculum. The survey was emailed to 167 faculty members, 24 teachers completed this survey and emailed it back. Of the informants, 12 teachers indicated students had time during their class to use the wiki. Also, 20 participants felt their students became more independent learners by using the wiki. Furthermore, 21 of the respondents felt students understood more about using technology after using the wiki in their classroom. In addition, 19instructors felt students were more social or interactive from using the wiki and 21 felt students shared information about the class by using the wiki. Additionally, 17 participants felt students understood the material more comprehensively by using the wiki and 20 felt the wiki aided in student learning outcomes for the courses they taught.

c) Results of the Analysis of Teachers' Interviews and Diaries

Teachers in the interviews and in the diaries they wrote indicated that wikis were informative, interactive, and active learning tools. The following notes have been detected in the analysis of these qualitative data:

- Most teachers noted that students enjoyed using the wiki and it's use instead of traditional paper work. The students had more mixed reactions. Some were reluctant to try a new way of accessing and producing information in the development of their wikis.
- When working in groups in an online course, students sometimes find the wiki hard to use. When students are in a face-to-face course, they find the wiki easier and are generally more positive about the process of wiki building.
- It is very encouraging for my students to realise that their work is being viewed by hundreds of people around the globe. This fact also encourages them to be more diligent and effective in e-portfolio assignments.
- Learners are enthralled by building their own wikis, and reading other wikis online, and everything they can do with wikis and get from wikis is conducive to more self-regulated, self-paced learning; thereby making wikis essential tools for learning English and an extension to the classroom activities.
- Wikis can be used as a means of global collaboration as classes from around the globe contribute their own ideas on a common subject using various media and websites.
- The wiki tool of Blackboard is far more interactive between students for our curriculum. Multi-student page/concept construction is wonderful and it can

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be easily integrated into the course materials and tools.

- Student communication with teachers and other students has improved because of the message system in the wiki over the LMS of Blackboard.
- Some students utilise wikis as a replacement for our supported learning management system, which they find disorderly designed and demands considerable instructor/student time to organize and manage. Thus, course wikis are protected private spaces, so they are open to the Internet for viewing. Most of the content created is student-led, which allows the entire community to share required management and maintenance duties.
- Wikis for personal and group project use emerge organically from the course wiki which they can independently create for unrelated projects, suggesting their exposure and familiarity to wikis in class can exercise more positive effects on the their awareness and use of collaboration tools.
- There are a few limitations such as the inability to post grades online and a slightly less than optimal email system, but otherwise it's been a good experience.
- Therefore, students need to know the purpose of each assignment since it is a public forum for which sometimes they need to be formal and sometimes deliberately ask questions of one another or react to others' ideas. The clearer the purpose was for students, the better the wiki worked. Some teachers use the wiki as a way to organize the class and to organize the readings.

V. Analysis and Discussion

Results from the present study indicates that using the wiki technology integrated in the Blackboard learning management system in the classroom provides positive results in promoting collaboration, knowledge building and student learning. This is congruent with prior research which shows students engage more when using technology and interactive methods as part of their learning experience (Collier, 2010). The literature also indicates that using wikis for learning can be beneficial to students in many ways, which include: fostering problem-solving skills, supporting collaborative and active learning environments, as well as using higher-level thinking and engagement of students in activities that encourage exploration (Williams& Chin 2009).

The improvements in the writing skills upon using wikis are also documented in prior research as it is revealed in the findings of the present study. For instance, students could work towards better composition skills (Désilets and Paquet, 2005; Ben-Zvi's, 2007). In addition, the use of wikis could lead to improvements in reading, writing, reflective thinking and collaborative skills as is revealed in this study, which is also commensurate with prior research findings. For example, Hazari, North, and Moreland (2009) noted technology tools, such as Blogs and Wikis can empower students by giving them a chance to express their views. The use of wikis to construct content knowledge and language skills was not only beneficial to the development of these cognitive and psychomotor aspects, but it also provided social interaction and provided students an opportunity to reinforce their skill sets. Qualitative data indicated that most informants in the present study concluded that the use of wikis was an enthralling experience as well as valuable to their student learning outcomes.

VI. Pedagogical Implications

In order for learning to take place, students must practice new skills with wikis. It does not necessarily matter how they achieve this practice. It can be done through quizzes and short assignments that require students to rehearse information. It can be done through discussions and forums. As was evidenced in the presentation of student work involving wikis and the discussion of those results, wikis can not only enhance the learning environment, but students can accomplish deep learning through their judicious application. Wikis canencourage students to practice their skills in real world applications.

Additionally, wikis should be integrated in the language curriculum to encourage students to read with a purpose and evaluate the text based on the criteria of the class. They expose students to a variety or readings and writings of varying levels of accomplishment. However, successfully utilizing wikis requires that they are integrated iteratively into the curriculum. Information must be presented prior to the wiki assignment. Once the wiki posts are completed, they must then be followed by a discussion of the concepts and posts in the class. Then and there, wikis can become a useful addition to the classroom when used with pedagogically sound application. The caveat with wikis as such is that they must beused iteratively. Thus the information follows the cyclicpattern necessary for transfer to long-term memory and life-long learning.

VII. Recommendations for Further Research

The study was limited in duration of the treatment. Twelve weeks may have been too short a time for students to become experienced with interacting with each other in wikis and reveal constantly positive attitudes towards wiki-based instruction. A longer treatment period for better results was suggested so the interactive process itself rather than technicalissues can be more deeply and clearly studied.

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The findings reveal that both technical and pedagogical issues need to be addressed in order to promote wikis as collaborative learning tools. Besides technicalusability, which is a self-evident requirement, there is a need for a pedagogical approachthat provides students with a genuine collaborative leaning model in teacher education.

Future work will focus on the refinement of the usability criteria and the instrumentsfor assessing students' perceptions of collaborative writing activities. In addition, futureresearch will be undertaken with larger student groups to ensure more reliability and validity.

More experimental studies could be conducted on fully web-based class using wikis. Thedifferent interaction environment may reflect different results from those obtained in thisstudy.

Similar studies could be conducted to examine the effects on different levels and genders of EFL learners such as freshmen as compared with senior students, and females as compared with males.

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