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Research and trends in the studies of WebQuest from 2005 to 2012: A content analysis of publications in selected journals
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Abstract
This paper provides trends analysis and content analysis of studies in the field of WebQuest that were published in seven major journals: TOJET, Educational Technology & Society, Educational Technology Research & Development, Computers & Education, Learning and Instruction, Australasian Journal of Educational Technology and British Journal of Educational Technology. These articles were cross analyzed by published years. Content analysis was implemented for further analysis based on their research topics, issues category, research settings and samplings, research designs, research method and data analysis. It was found that WebQuest benefited students academically. The results of the analysis also provides insights for educators and researchers into research trends and patterns of WebQuest.

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Keywords: WebQuest; Research Trend; Content Analysis

1. Introduction
The process of learning and improving students performance by using appropriate technological processes and resources have been the order of the day. In this regard, WebQuest application is a new phenomenon that motivates students in their learning processes (Dodge, 1995). It has been used by students as a web-based tool for collecting and evaluating information to increase their learning performance. According to Dudeney (2003), its application that requires student to perform certain tasks, analyse, evaluate and solve problems motivates students than outdated course books and other such teaching materials. WebQuest is a web-based activity which requires the students to be active learners and allows them to enhance their higher order thinking skills such as finding topic-related web sites, examining and selecting well-prepared and reliable Web sites (Halat, 2008). Regarding finding relevant resources, they must evaluate the sites so that all the unnecessary information will be eliminated and this will help them to develop their critical-thinking skills. WebQuest is a valuable tool for providing students with many interaction opportunities in realistic settings thus making for a more meaningful, experiential and very motivating learning experience. If the WebQuest is associated with students’ professional needs, their implementation can be very successful and it helps to enhance students’ skills both in academic and cooperative work (Laborda, 2009). As research documented that WebQuests is more effective in promoting student engagement, motivation, connecting to authentic contexts, critical thinking, creativity, literacy skills, improving problem solving skills, social interaction, scaffolding learning and collaborative learning (Abu-Elwan, 2007; Allan & Street, 2007; Abbitt & Ophus, 2008;

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Ikpeze & Boyd, 2007; Kanuka, Rourke & Laflamme, 2007; Lara & Reparaz, 2005; Lim & Hernandez, 2007; Segers & Verhoeven, 2009; Yasemin, Madran & Kalelioglu, 2010). That is why a majority of the teachers used WebQuest as a tool for teaching and learning; to achieve the learning outcomes (Yasemin, Madran, & Kalelioglu, 2010; Segers & Verhoeven, 2009; Cheng, Tsung, & Wei, 2011; Pear & Crone-Todd, 2001) and assisted in bridging the gap between theory and practice (Lim & Hernandez, 2007).

A WebQuest is one example of how teachers can integrate technology into classrooms, which is a growing area of interest as information technology creates new learning opportunities and becomes more accessible across the world (Krismiyati Latuperissa, 2012; Garry, 2001; Lin & Hsieh, 2001). Research has shown that integrating technology especially using internet in teaching and learning can have positive influences on students’ motivation, inquiry-based learning, attitudes, achievement and peer interactions in the classrooms (Abu Bakar Nordin & Norlidah Alias, 2013; Chandra & Lloyd, 2008; Dorothy Dewitt, Saedah Siraj & Norlidah Alias, 2013; Lim & Tay, 2003; Norlidah Alias & Saedah Siraj, 2012; Wang, Kinzie, McGuire, & Pan, 2010).

In Malaysia the research done on WebQuest is still lagging far behind compared to other countries in the world. Research done in 2009 by Norazah Mohd Nordin & Ngau Chai Hong on the development and evaluation of WebQuest for Information and Communication Technology subject found that WebQuest could attract students to search more information using the web by using the link attached. It also serves as an easy way for e-learning.

So far, there have been numerous publications about WebQuests in the last few years; the majority have either fallen within the categories of conceptual, descriptive, design or other technical aspect of it (Sax & Rubinstein-Avila, 2006). Since then, there has been increasing research on WebQuest application on a wide range of topics. However, none has focused on content analysis of publications on WebQuests.

2. Research Objective

This review intends to concentrate on and learn about the research trends related to WebQuest covering the years 2005 to 2012. The articles were obtained from seven professional journals and abstract databases published in the Social Sciences Citation Index (SSCI); which has comprehensive coverage of the world’s most important and influential journals and research results. This paper only covers 7 journals that have been selected from ISI, namely the Educational Technology Research and Development (ETRD), Turkish Online Journal of Education and Technology (TOJET), The Educational Technology And Society Journal (ETS), The Learning and Instruction Journal (L&I), Australasian Journal of Educational Technology (AET), British Journal of Educational Technology (BET), as well as Computer & Education (C&E).


Accordingly, this review will provide content analysis of such journal articles by categorizing them based on the research topic, methodologies, design and WebQuest trends. Our analysis, therefore addresses the following research questions:

1. What are the research topics about WebQuest during the study period from these selected journals?
2. What are the research methodologies that have been used?
3. What are the research designs that have been applied?
4. What are the WebQuest trends in the selected journals?

The study undertaken is to extract the similarities and differences from the above classification including the findings found in those selected journal articles. It may shed some light on future research that will be conducted and provide guidance for researchers and a basis for discourse for policy makers.

3. Method

Content analysis is a research technique and tool for social science and media researchers. As a scientific method for an objective, systematic, and quantitative description of the manifest content of communication (Berelson, 1952).
Furthermore it can be extended to describe the characteristics of content of a document, making an observation and provides an analysis. Krippendorff (1980) defined content analysis as a research technique for making replicable and valid inferences from data to their context. One of the most frequent uses of the content analysis is to study the changing trends in the theoretical content and methodological approaches by content analyzing the journal articles of the discipline (Loy, 1979).

Firstly, a content analysis of journal articles was conducted by formulating the research question and the objectives of the study. Secondly, 7 journals were selected which were published in the Social Science Citation Index (SSCI) pertaining to WebQuest research. Thirdly, a set of criteria were set for the analysis and development of the content categories. Fourthly, data preparation for the necessary analysis was completed before final analysis and drafting of the report.

In order to examine the research trends in WebQuest research, the study made classification of research topic of each published article. Descriptions of those categories consist of (i) Research Trends (ii) Research topics (iii) Research Design and methodology; and (v) Data analysis and findings.

**Webquest Research Trend**

The utilization of information technology such as internet, digital program and gadget has increased in education. Recently the use of internet learning tools such as WebQuest, Facebook, Wiki, YouTube and Web-Based have been integrated into instructional learning in the classroom. Focusing on the topic of WebQuest in all the 7 selected journals and results of trend analysis from 2005-2012 shows that out of 3614 articles published, only 13 articles were related to WebQuest. This is only about 0.35% from the total number of journals analyzed as shown in Table 1.

Table 1: Number of research articles in WebQuest published in 7 selected Online journals.
The study found that from the year 2005 until 2012; only 1 or 2 articles which were related to WebQuest were published in the seven selected journals. For example, in AET there is a research on self regulated WebQuest learning system for Chinese elementary schools. While in TOJET there were two articles that studied WebQuest was found in 2010 & 2012. ETS also had the same pattern which WebQuest related research articles found in 2009 and followed in 2010. The issues that were highlighted since 2009-2012 was reading comprehension performance (2012), motivation of the preservice elementary school teachers (2011), oral communication in English (2009) and WebQuest- Web Macaresi for teaching and learning (2010).

Two articles from TOJET 2011 and 2012 clearly discussed advantages of using WebQuest. The post-test administered in those research found that WebQuest helps in improving students’ reading comprehension performance and it shows that WebQuest use has the potential in promoting competency in reading comprehension. For this reason, teachers and students need to be trained in order to use WebQuest more effectively (2012). The preservice elementary school teachers who used designed WebQuest–based applications in teaching and learning mathematics shows that it had a great effects on their motivation (2011). Results of these studies imply that developing WebQuest-based activities in a college level methodology courses may have more positive effect on the attitudes of the pre-service elementary school teachers towards teaching and learning mathematics, rather than doing spreadsheet activities. If they try to design WebQuest activities as a group or individual project in their methodology courses, they might have the opportunity to practice their pedagogical and content knowledge in a different environment, which will give more benefit in developing their competency. Multimethodology in teaching and learning processes also promises a good sign to practice not only for teachers, but also the students. The distribution of WebQuest articles in selected journals is shown in Table 2.
Table 2: Distribution of WebQuest articles in selected journals

<table>
<thead>
<tr>
<th>Journal</th>
<th>No of WebQuest articles</th>
<th>Total of articles</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETRD</td>
<td>1</td>
<td>233</td>
<td>0.4%</td>
</tr>
<tr>
<td>TOJET</td>
<td>2</td>
<td>398</td>
<td>0.5%</td>
</tr>
<tr>
<td>ETS</td>
<td>2</td>
<td>493</td>
<td>0.4%</td>
</tr>
<tr>
<td>L&amp;I</td>
<td>1</td>
<td>294</td>
<td>0.3%</td>
</tr>
<tr>
<td>AET</td>
<td>1</td>
<td>51</td>
<td>1.96%</td>
</tr>
<tr>
<td>BET</td>
<td>2</td>
<td>906</td>
<td>0.2%</td>
</tr>
<tr>
<td>CNE</td>
<td>1</td>
<td>1240</td>
<td>0.08%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>3614</td>
</tr>
</tbody>
</table>

One of the main purposes of this study was to categorize research topics in WebQuest and to help indentify research trends from 2005-2012 in the 7 selected journals. The selected articles which were reviewed were classified into three categories such as WebQuest as learning environment, WebQuest as a learning tool and WebQuest for self development. Our study found that 40 % of the articles focused on the learning environment. For example, research done by Allan and Street (2007) on the impact of a knowledge by pooling WebQuest in primary initial teacher training shows that WebQuest has the potential to promote high order learning within different disciplines in higher education. It also creates a new environment in learning. As a result, the study of the 10 articles on WebQuest research found that: (1) when WebQuest was used in real situations, students could acquire more knowledge and experiences, and (2) in the learning activity of the experiment, the students accomplished different learning tasks and expressed their own opinions and perspectives, which could foster their critical thinking skills. On the other hand, the students in outdoor situation could be positive to participate in learning activity. Based on these outcomes, WebQuest has the potential to develop as a pedagogical model for teaching and learning. In Table 3, the study summarizes the content analysis from the selected journals.

Table 3: Content analysis of WebQuest articles in selected journals.

<table>
<thead>
<tr>
<th>Research Topic</th>
<th>Topic Category</th>
<th>Source : (author, year, journal, page no.)</th>
<th>Sample and research location</th>
<th>Research Design</th>
<th>Instrumentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning in a sheltered Internet environment: The use of WebQuests</td>
<td>Environmental Education</td>
<td>Segers &amp; Verhoeven Learning and Instruction Vol 19 (2009) : 423-432</td>
<td>229 Grade Sixth (116 boys &amp; 113 girls), Elementary School in Netherlands</td>
<td>Quasi-Experimental Design and Statistical analyses to measure the effects of WebQuests.</td>
<td>CITO Test, Digit Span Test, Questionnaire (21 Items), Knowledge Test, Scoring Form,</td>
</tr>
<tr>
<td>WebQuests in special primary education: Learning in a web-based environment109 9 801...</td>
<td>Differences in learning gain when performing a WebQuest with a well-defined versus an ill-defined assignment</td>
<td>Tijjs Kleemans, Eliane Segers, Mienke Droop and Hanneke Wentink British Journal of Educational Technology Vol 42 No 5 2011 801–</td>
<td>Twenty boys and twenty girls (mean age 11; 10), attending a special primary education school, performed two WebQuests.</td>
<td>Knowledge acquisition was assessed by means of a concept map (ie, associative knowledge) and a knowledge test, based on facts concerning the</td>
<td>Concept map (associative knowledge) and a knowledge test,</td>
</tr>
</tbody>
</table>
The quest for deeper learning: an investigation into the impact of a knowledge-pooling WebQuest in primary initial teacher training by Norlidah Alias et al.

Explores the impact on learning in higher education of the integration of a knowledge-pooling stage into a WebQuest. Jo Allan and Mark Street  
British Journal of Educational Technology Vol 38 No 6 2007 1102–1112

Questionnaires were completed anonymously by 87 of the 95 students participating in the sessions; 37 of these respondents were on the BEd course and 50 were on the PGCE. Two focus groups were formed: one consisting of eight BEd final-year students, and one consisting of six PGCE students. Twelve questions were used to guide the focus group sessions.

i. Explain the concept of WebQuests, consider recent literature regarding the effects and difficulties of this approach to learning.

ii. Examine students’ perceptions of the impact of this tool on high-order learning.

Implementing a self-regulated WebQuest learning system for Chinese elementary schools by Hsien-Sheng Hsiao, Chung-Chieh Tsai, Chien-Yu Lin and Chih-Cheng Lin  
Australasian Journal of Educational Technology 2012, 28(2), 315-340

Participants in the study including 193 students in six classes, with average 12 years of an elementary school in Taipei County, Taiwan. The experimental group and the control group are composed of three classes respectively.

The current study investigates the correlation between students’ self-regulated behavior and their achievement when using WebQuest learning through the self-regulated learning assisted functions and traditional WebQuest learning.

The questionnaire was used in order to gain as broad a picture as possible of student perceptions of learning via WebQuest.

Used quasi-experiment to study the effect in WebQuest learning, and sequential analysis to calculate students’ particular interaction patterns.

Study was a five-week experiment, in which the independent variables were the WebQuest learning with as well as the WebQuest learning without self-regulated learning assisted functions, and self-regulated levels of the students, while the dependent variables were their learning effect.
<table>
<thead>
<tr>
<th>Title</th>
<th>Field</th>
<th>Authors</th>
<th>Participants</th>
<th>Methodology</th>
<th>Results/Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>The effect of two different cooperative approaches on students’ learning and practices within the context of a WebQuest science investigation</td>
<td>Science Education</td>
<td>Zacharias C. Zacharia • Nikoletta A. Xenofontos • Constantinos C. Manoli</td>
<td>The participants were 38 seventh-graders (14 year-olds) from two classes (Nclass1 = 18 and Nclass2 = 20) of a public school (Gymnasium) in Nicosia, Cyprus</td>
<td>Qualitative</td>
<td>WebQuest Conceptual test Screen and video captured data Interviews</td>
</tr>
<tr>
<td>The study on integrating WebQuest with mobile learning for environmental education</td>
<td>Environmental Education</td>
<td>Cheng-Sian Chang, Tzung-Shi Chen, Wei-Hsiang Hsu</td>
<td>One hundred and three sixth-grade students in a public school in Tainan, Taiwan, participated in this study, and their ages ranged from 11 to 12</td>
<td>Experimental design</td>
<td>Pre test Post test</td>
</tr>
<tr>
<td>The effect of using WebQuests on reading comprehension performance of Saudi EFL Students</td>
<td>Reading comprehension performance</td>
<td>Yousif A. Alshumaimei &amp; Meshail M. Almasri</td>
<td>1st year preparatory program with 83 level 3 male students in the science and engineering track in the preparatory Year (PY) in King Saud University.</td>
<td>Quasi-experiment. pre-test and post-test quasi-experiment non equivalent control group research design.</td>
<td>Data collected were analyzed using SPSS and t-test was computed to investigate the differences between the pre-test and post-test. An analysis of covariance (ANCOVA) was conducted, partialling out the pre-test scores, in order to investigate the differences between the experiment and control group in the post-test.</td>
</tr>
<tr>
<td>The impacts of mathematical representation developed through motivation of pre-service elementary school teachers</td>
<td>Medicine</td>
<td>Halat E (Halat,Erdogan); Peker M (Peker, Murat).</td>
<td>30 students in experimental group and 40 students in control group.</td>
<td>Quasi experiment. Questionnaires, Course interest survey (CIS) as pre test scoring guide in the analysis of the CIS.</td>
<td>The response scale range from 1-5. t-test statistical</td>
</tr>
</tbody>
</table>
WEBQUEST and spreadsheet activities on the motivation of pre-service elementary school teachers.

The study conducted in the spring semester 2008 and it took place for 7 weeks. Each group had 4 hours of instruction in a week.

70 pre-service elementary school teachers as a convenience sampling that enrolled in mathematics teaching course at a university located in central Turkey.

and post test in the study. To investigate how students are motivated, or expected to be, by the particular setting.

Included 34 statements that categorized into 4 part:

i. attention
ii. relevance
iii. confidence
iv. satisfaction

procedure with $\alpha = .05$ in the pre-test scores to determine any differences in terms of motivational level between exp. and control groups. This t-test procedure showed means scores differences in term of level and motivational between the two groups favouring the control group. Then scores from the CIS were compared using one-way analysis of covariance (ANCOVA) with $\alpha = .05$, which is a variation of ANCOVA, to adjust for pretest differences that existed between control and exp groups.
This paper analyzed the publication by the methodology involved in WebQuest research. The results shows that 60% of the articles used quasi-experiment as the research design. The research objectives were more to see the positive aspects of using WebQuest. The other methods used were Developmental Research and as a concept paper. For example in TOJET (April 2011- Vol 10, Issue 2), a study on the impacts of mathematical representation developed through WebQuest and spreadsheet activities on the motivation of pre-service elementary school teachers used quasi experiment which involved 30 students in the experimental group and 40 students in the control group. While, the study done by Zacharias, Nikoletta, and Constantinos (2011) used a qualitative approach to study the effect of two different cooperative learning approaches, namely, the Jigsaw Cooperative Approach (JCA) and the Traditional Cooperative Approach (TCA), on students’ learning and practices/actions within the context of a WebQuest science investigation. Various aspect of the learning processes including performance, comprehension, understanding, creativity and motivation were highlighted. The study described the implementation of a WebQuest in science in which 38 seventh-graders were involved as participants to study about the ecology, architecture, energy and insulation of CO₂-friendly houses. The result revealed that by applying the Wilcoxon test procedure, the JCA and TCA conditions improved the students’ understanding of concepts related to the ecology, architecture, energy and insulation of CO₂-friendly houses. However, there were no differences between the two approaches, in terms of enhancing students’ understanding of concepts related to CO₂-friendly houses using the Mann-Whitney procedure. The study described 6 categories of working mode that the students followed within the context of a WebQuest science investigation. The study also identified 4 categories of problems the students face within the context of a WebQuest science investigation (i.e., the problem with regard to the actions/practices (working mode) to follow, the WebQuest material, the web-based platform tools and student interaction within a group).

In comparison, the articles in C&E which studied WebQuest used an experimental design as the approach. An experimental group comprising 103 sixth-grade students participating in the study were broken down into three groups namely: traditional instruction, traditional instruction with WebQuest and WebQuest instruction with outdoors. Their assignment was to learn more about resource recycling and classification with the objectives being to know about the use of natural resources which not only improves the quality of life but also destroys the natural landscape and brings about environmental pollution at the same time; to learn the concept of resource recovery so that they can form habits of resource recovery and classification; and to understand that the earth’s resources are limited. The results of the study showed that using WebQuest in outdoor instruction influences students’ learning performance positively.

As a result of this study, the research methodologies had been used in all the articles appeared in the seven selected journals were descriptive research studies conducted involving WebQuest. The focus was on informational research with regard to the concept or the use of WebQuest in education.

Conclusion

The present study examines the WebQuest research trends between 2005-2012 from seven selected journals. In this decade, the WebQuest research trend has involved the quasi experimental study on how WebQuest can be used as a tool in teaching and learning, enhancing student potential and creating a positive learning environment. The analysis shows that all research had relied on a descriptive methods and critical analysis. It puts less concern on the importance of interpretative methodology that can be applied. Both types of research could emphasize and attempt to understand such phenomenon (WebQuest application) in order to deal with the issues of ability, reliability and effectiveness of such technology in terms of creating a better student and teacher as well. From the research also, it shows that we do not have any evidence that the studies were able to deal with those issues. Finally, this study suggests that research in the future should expand the data sources for more deliberate analysis. Future research is also encouraged to conduct similar studies; but with more current information and research data from various sources.

References


