Learning from WebQuests: A Mix-Method Comparative Study

By
Martonia Leite
mleite@unlserve.unl.edu

University of Nebraska - Lincoln

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A Little History on WebQuests

- Bernie Dodge and Tom March
- Year 1995
- San Diego State University

What is a WebQuest?

" A WebQuest is an inquiry-oriented activity in which most or all of the information used by learners is drawn from the Web" *(Bernie Dodge and Tom March)*

Types of WebQuests:

- Short-term WebQuests (1-3 days)
- Long-term WebQuests (longer than 3 days)

Critical Attributes:

- Introduction
- Task
- Resources
- Process
- Evaluation
- Conclusion

Literature:

- Promotes critical thinking
- Narrows and directs students' Web search (Vidoni, Maddux, 2002, p.103)

Literature:

- Development of computer skills (Summerville, 2000)
- Child-safe Internet environment (Vidoni, Maddux, 2002, p.103)

Literature:

- Realistic tasks (George Lipscomb, 2003, p.77)
- Collaboration (group learning)

Literature:

- Scaffolded structure (March, 1999)
- Authentic tasks increase motivation (Brucklacher, Gimbert, 1999, p.39)

Purpose of the Study:

Determine whether there is a difference in learning between the WebQuest method and Classroom Instruction.

Why Mixed-Method:

"The best understanding of a problem emerges from using both quantitative as well as qualitative data" (Creswell, p.569)

Data Collection Procedures:

- Quantitative data (pre-test and post-tests)
- Qualitative data (in-depth interviews and classroom observations)

Participants :

- Social Studies students (n=72)
  - Computer Lab (n=31)
  - Classroom (n=41)
- Science students (n=72)
  - Computer Lab (n=31)
  - Classroom (n=41)

Measures:

Pre-test and post-test over concepts, general understanding and critical thinking over the topic covered in each study.

WebQuests:

http://cehs.unl.edu/mcleite/

Samples of Students' Work:

Rocks & Minerals 1
Rocks & Minerals 2
History 1
History 2

Hypothesis:

There will be no difference in learning between the WebQuest method and the classroom instruction (H_0: $\mu_1 = \mu_2$)

There will be a difference in learning between the WebQuest method and the classroom instruction (H_1 : $\mu_1 \neq \mu_2$)

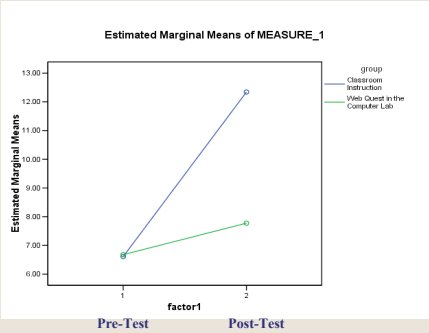
Results: Pre-test and Post-test Social Studies

Descriptive Statistics

		N	Mean	Std.	Variance	Skewness		Kurtosis	
grouo		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Classroom Instruction	Pretest Score	41	6.61	2.084	4.344	.151	.369	-.589	.724
	Posttest Score	41	12.34	2.198	4.830	-.623	.369	-.299	.724
	Valid N (listwise)	41							
Web Quest in the Computer Lab	Pretest Score	31	6.68	2.574	6.626	.220	.421	-.689	.821
	Posttest Score	31	7.77	2.109	4.447	.706	.421	.204	.821
	Valid N (listwise)	31							

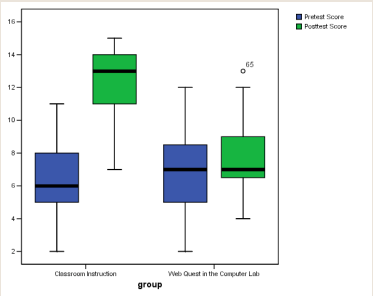
Multivariate Test
Results of One-Way MANOVA

Wilk's Lambda (Λ) of .430 is significant, $F(1, 70) = 45.66$, $p < .0001$, indicating that we reject the null hypothesis. The population means on the dependent variables are significantly different for the two teaching methods.



Pre-Test Post-Test

Box Plot



Limitations:

- Time
- Individual work
- No presentations
- Teaching Experience (more than > 20 teaching years)

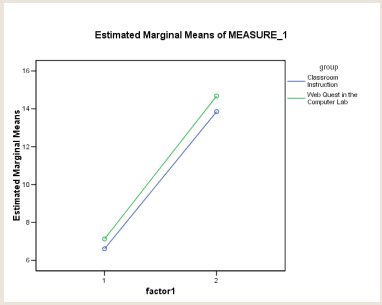
Results: Pre-test and Post-test Science

Descriptive Statistics

group		N	Mean	Std.	Variance	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Classroom Instruction	PretestSce	41	6.61	2.548	6.494	.242	.369	.143	.724
	PosttestSc	41	13.85	5.452	29.728	-.069	.369	-1.311	.724
	Valid N (listwise)	41							
Web Quest in the Computer Lab	PretestSce	31	7.13	2.849	8.116	.055	.421	-.493	.821
	PosttestSc	31	14.68	5.121	26.226	-.206	.421	-1.067	.821
	Valid N (listwise)	31							

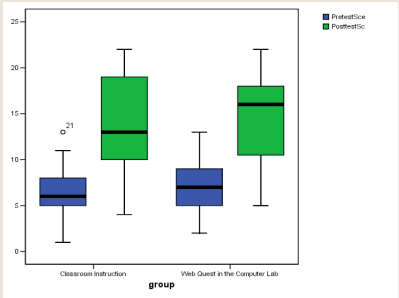
Results of One-Way MANOVA

Wilk's Lambda (Λ) of .988 is significant, $F(2, 69) = .419$, $p = .659$, indicating that we do not reject the null hypothesis. The population means on the depend variables are not significantly different for the classroom instruction and WebQuest Methods.



Pre-Test Post-Test

Box Plot



Limitations:

- Teaching experience (less than 2 years)
- Supervision
- Rock Cycle factor

Themes:

- Change of Pace
- Active Learning
- Sense of Purpose/Ownership
- Structured Learning
- Technology

Themes

Change of Pace

- *"Much better than just being in the classroom"*
- *"It was much better than just listening and taking notes in class"*
- *"It was so much fun and it was much better than just listening to the teacher and taking notes"*

Active Learning

- *"I like to do hands-on staff"*
- *"I thought it was very interesting and I enjoyed it a lot"*
- *"I liked working with a partner. If you don't find something he will, then you have everything you need"*
- *"Students found extra information, things that we didn't have in class. They were busy all the time. Lots of exploration".*

Structured Learning

- *"Everything was clear – we knew exactly what to do and where to go"*
- *"I liked the way it was set up. We had everything that we needed on one page"*
- *The resources were already there, we just had to go and explore".*
- *"A WebQuest is very detailed"*

Technology

- *"I loved working on the computers"*
- *"It was nice to have an opportunity to work with technology. Internet provides us with so many resources"*
- *"I liked that I was able to search the Internet and do things on my way"*

Sense of Purpose/Ownership

- *"I like to find information for myself and making presentations because I understand it better"*
- *"We could use different sources and if we didn't like one web site, we could always choose a different one"*
- *"I like the freedom for students to do their own work and get creative".*

Questions?