

6-11-2018

# Technology Use for Extra-Curricular Activities and Academic Performance in Library Instruction Sessions

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## Recommended Citation

Salisbury, Lutishoor; Omolew, Abayomi Omotola; and Smith, Jeremy J., "Technology Use for Extra-Curricular Activities and Academic Performance in Library Instruction Sessions" (2018). *University Libraries Faculty Publications and Presentations*. 26. <http://scholarworks.uark.edu/libpub/26>

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# Technology Use for Extra-Curricular Activities and Academic Performance in Library Instruction Sessions

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## Summary

This poster reports on a study that investigated:

- The impact of students' use of technology for extracurricular purposes during instruction sessions and its effects on their learning and retention of information.
- Whether attendance at a previous library instruction session provided the students with the advantage of scoring higher in the assessment, and
- Whether the use of these technologies in class sessions was disruptive to other students.

## Characteristics of Participants

One time library instruction/Information literacy session during the Spring and Summer 2017

Instruction sessions were between one and a half and two hours long

Students registered in 3 chemistry undergraduate courses:

- CHEM 1053 (Introduction to the modern world) – elective
- CHEM 1073 (Fundamentals of Chemistry) – required for the Nursing and Dietetic students
- CHEM 1123 (University Chemistry II) – elective for science majors and required to continue on to Organic Chemistry

Students were required to attend a library instruction session

Total sessions: 28

## Information Literacy Content

Types of publications:

- Differences between a book and journal articles
- Types of serial publications (newspaper, magazine, journal)

Why databases? Selecting the appropriate one

Searching techniques:

- Using records and fields
- Boolean operators, Proximity operators, etc.

Hands-on training from examples provided.

The Web of Science database was used to demonstrate the concepts.

In-class assignment administered using Qualtrics at the end of the session.

Grades from this assignment contribute to their laboratory session grade.

CHEM 1123 received additional instruction on searching SciFinder, Reaxys, and Handbooks.

## Methodology: Two approaches

### First Approach

Randomly assigned the sessions to the experimental and control groups.

Experimental group was told to put away their phones during the session.

Students were not told why they should put away their phones.

Did not monitor students' use of their phones during the session.

## Methodology

### Second Approach

Survey method

Approved by the University's Institutional Research Board

Informed consent

Attached to the end of the assignment

Students self-reported on their use of phone during instruction session.

Non-participation did not affect their grades.



## Registration by Class/Assignment in Groups

Classes			
Class	# of Students Registered	# of Students Attended	# of Sessions
1051L	50	46	2
1071L	102	96	5
1121L	658	631	21
<b>Total</b>	<b>810</b>	<b>773</b>	<b>28</b>

Groups				
Class	Control		Experimental	
	# of Students	% of Students	# of Students	% of Students
1051L	23	2.98	23	2.98
1071L	45	5.82	51	6.6
1121L	317	41.01	314	40.62
<b>Total</b>	<b>385</b>	<b>49.81</b>	<b>388</b>	<b>50.19</b>

49.81% in Control group

50.19% in Experimental group

## Results — First Approach

Students in the experimental group (no phones) scored in the higher-grade ranges.

The mean score for students in the experimental group [89.11 ± 10.29, n = 388] was significantly higher ( $p=0.003$ ) than the control group [86.86 ± 12.61, n = 385].

1.55% students from the experimental group earned less than 60 points as compared to 3.64% from the control group.

### CHEM 1051L/1071L

The mean score for students in the experimental group was 4.22 points higher than the control group (90.19 versus 85.97). This difference is significant ( $p=0.042$ ).

Students assigned to the experimental group earned in the higher point ranges >80 %, 77.03% versus 63.24%.

### CHEM 1121L

10.18% of the students in the experimental group earned below 80 points compared with 18.30% of the control group, an 8.12 percentage point advantage for the experimental group.

The mean score for students in the experimental group was significantly higher than those in the control group, 88.85 vs. 87.05 ( $p=0.037$ ).

Lutishoor Salisbury, Abayomi Omotola Omolewu & Jeremy J. Smith (2018). Technology Use for Non-Educational Purposes during Library Instruction: Effects on Students Learning and Retention of Information, Science & Technology Libraries, DOI:10.1080/0194262X.2018.1456391

## Results — Second Approach—Survey Results

Class	Survey Respondents by Class					
	Total		1051L/1071L		1121L	
	#	%	#	%	#	%
Respondents	559	72.32	115	80.99	444	70.36
Non-Respondents	214	27.68	27	19.01	187	29.64
<b>Total</b>	<b>773</b>	<b>100</b>	<b>142</b>	<b>18.37</b>	<b>631</b>	<b>81.63</b>

Devices Used (n=271 Students)		
Device Used	#	% of Students
Smart phone	157	57.93
Tablet	3	1.11
Laptop	34	12.55
Computer (library supplied)	126	46.49

49% (n=271) students reported at least one activity

28% (n=76) reported 2 activities

15% (n=40) reported 3 activities

5.9% (n=16) reported 4 activities

5.5% (n=15) reported 5 activities

144 (54.96%) were in the control group

127 (42.76%) were in the experimental group

The average score for all the students who self-reported that they did not use a device during class was 0.17 points higher than those who reported they used a device.

These results were not significantly different for the two groups.

## Attendance at Prior Librarian Instruction

Students have benefitted from attending more than one library instruction session.

The mean score for students who previously attended a library instruction session [91.25±9.28, n=175] was significantly higher than for those who had not [88.30±11.51, n=384] (Welch's t-test,  $t(411.61)=-3.233$ ,  $p<0.001$ ).

The higher average score -- also true whether students were assigned to the control or experimental groups in the first approach.

The average score for the students in the control group who had attended a prior library instruction session was 3.82 points higher than those who did not attend a prior session (90.44 versus 86.62).

For the experimental group, it was 2.06 points higher (91.9 versus 89.84).

## Use of Devices — Disruptive Behavior?

553 respondents to the question of whether they used a device in class

48.28% (n=267) did not notice other students using devices

45.93% (n=254) did notice but did not find behavior disruptive

5.79% (n=32) observed the behavior and found it disruptive

These students had lower scores — disruption may have contributed to lower grades.

## Conclusion

One time library instruction

Students who used devices for extra curricular activities in class earned lower points in the assessment. This was true regardless of group (control or experimental) or class (CHEM 1051L/1071L and CHEM 1121L).

Students in the experimental group performed significantly better than students in the control group that were not instructed on the use of their phones.

Students who attended a prior library instruction session scored higher than those who did not. This result is true irrespective of the group the students were in (control or experimental), or if they used their devices for off-task purposes.