Acquisition and Integration of SMART Board™ Interactive Whiteboard Skills: Gender Differences Among College Faculty, Staff and Graduate Assistants

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Purpose

This study examined whether gender differences exist among college faculty, staff and graduate students (FSG) in terms of participation in and the acquisition of SMART Board interactive whiteboard skills gained from attending SMART Board interactive whiteboard training sessions. The integration of SMART Board interactive whiteboards into the curriculum was also investigated. The study centered upon FSG who participated in SMART Board interactive whiteboard training sessions conducted by the University of Southern Mississippi's (USM) Center for Education and Learning Technology (CELT) during the Fall 2002 and the Spring 2003 semesters.

Background

Gender disparities in competency and use have existed since the inception of technology. The U.S. Office of Educational Research and Improvement in Washington, DC, reported in 1995 that although the U.S. has made slow progress toward recognizing women in nontraditional areas such as technology use, strong negative social messages are still projected toward women in these areas (Boland, 1995). Papers presented at the 1995 AAUW Pre-Convention Symposium consistently maintained that technology challenges faced by girls at the K-12 level are often extended to the higher education level, even among women faculty (1995). Men are expected to lead in the use of technology, while women are expected to follow and watch.

Kagima and Hausafus (2000) also reported gender differences in faculty reported competency with computers in that women generally described themselves as less capable than men. This attitude was not restricted to the United States. In Henwood's (2000) investigation of this issue in the United Kingdom, technologically proficient

women were considered exceptional faculty members since it was presumed that women were less capable in technology use. These gender disparities result from societal expectations and prejudices and the assumption that women and technology do not mix still exists (Forcier & Descy, 2002). This assumption also holds true in higher education as people assume that men are more interested and comfortable in using technology than women.

Research Questions

The research questions posed in this study include:

- 1. Are there gender differences in attendance of SMART Board interactive whiteboard training sessions?
- 2. Are there gender differences in participation in SMART Board interactive whiteboard training sessions?
- 3. Are there gender differences in SMART Board interactive whiteboard practice time during training sessions?
- 4. Are there gender differences in the comfort level and classroom use of SMART Board interactive whiteboards after the training sessions?
- 5. What do FSG members learn from one training session? Do they feel that one session is enough?
- 6. Does the pedagogy used in the training session affect what participants learn?
- 7. Are there gender differences in the use of the SMART Board interactive whiteboard in instructional settings?
- 8. Are there gender differences in FSG members' perceptions of the advantages of using the SMART Board interactive whiteboard to promote teaching and learning?

To address these research questions, we collected pilot data using a workshop participant survey (Appendix A) and an observation checklist (Appendix B). Based on the pilot findings, the instruments were refined where appropriate. We then collected data using the modified checklist and survey at three SMART Board interactive

whiteboard training sessions held during the spring semester. The descriptive data, both qualitative and quantitative, were analyzed and presented in this final report.

Pilot Study Results

Our pilot results showed that more female than male FSG attended SMART Board interactive whiteboard training sessions. The females participated and volunteered more in the overall training but did not monopolize the practice time during and after the session. Additionally, female FSG demonstrated more attentive behaviors than male faculty during the training session.

No gender differences were found in any of the following areas: actual classroom use and comfort level of faculty using SMART Board interactive whiteboards following training sessions, the amount of learning FSG acquired at the training sessions, whether pedagogy affected what FSG learned about SMART Board interactive whiteboards, and how participants perceived that SMART Board interactive whiteboards could be used in their classrooms to promote teaching and learning.

Although gaps remained in how female FSG are perceived as technology learners and users, these pilot data did not support that gap in participants' perceptions and actions. Female faculty seemed as eager and as capable as male faculty in SMART Board interactive whiteboard training and classroom use.

Final Study Results

The following tables represent the findings from the three spring training sessions. The sample for those sessions consisted of 16 females, 9 males and 1 unidentified. Table 1 presents the regular and composite variables used in this analysis. Table 2 presents the descriptive statistics for the sample.

Table 1: Definition of Variables

Variables	Description	Research Qu	iestion Addressed	Scale
Gender	Sex of respondents		All	1–2
Session	Survey questions 1 &	2	5	2–10
Learn	Survey questions 3, 4, 9, 10, 11, 12 & 13	5, 7, 8,	6	10–50
Instruct	Survey questions 14 &	z 15	4	2–10
Teach	Survey questions 16,	17, 18, 19 & 20	8	5–25

Table 2: Descriptive Statistics of the Sample

<u>Variable</u>	s N	Mean	St. Dev.	Minimum	<u>Maximum</u>
Gender	M= 9 F=16 Missing= 1	n/a	n/a	n/a	n/a
Session	26	8.42	1.58	5.00	10.00
Learn	26	41.96	3.65	35.00	50.00
Teach	26	23.42	1.75	20.00	25.00
Instruct	26	9.5	.99	6.00	10.00

The following sections report the results of the Chi Square and ANOVA analyses, divided into their respective research questions listed in the research question section of this paper.

Research Question One:

A Chi Square goodness of fit test was conducted to determine if there were gender differences in attendance of SMART Board interactive whiteboard training session. The Chi Square was significant, X^2 (25) = 20.85, p < .001. This indicated that there was a statistically significant gender difference and that approximately twice as many female FSG attended the SMART Board interactive whiteboard training sessions as their male counterparts.

Research Question Two:

A Chi Square goodness of fit test was conducted to determine if there were gender differences in participation in SMART Board interactive whiteboard training sessions. The Chi Square was significant, X^2 (313) = 308.02, p < .001. This indicated that there was a statistically significant gender difference and that there were nearly seven times more incidences of SMART Board interactive whiteboard participation behaviors by female FSG during the training sessions than by male FSG.

Research Question Three:

A Chi Square test was conducted to determine if there were gender differences in SMART Board interactive whiteboard practice time during training sessions. The Chi Square was significant, X^2 (43) = 37.17, p < .001. This indicated that there was a statistically significant gender difference and that there were nearly four times more incidences of female FSG SMART Board interactive whiteboard hands-on practice during the training sessions than male FSG.

Research Question Four:

An Analysis of Variance (ANOVA) was used to determine if there were gender differences in the comfort level and classroom use of SMART Board interactive whiteboard technology after the training sessions. The ANOVA was not significant, F (1, 23) = .96, p = .34. This demonstrated that female and male FSG felt equally comfortable in post-training classroom SMART Board interactive whiteboard use.

Research Question Five:

Both inspection of participants' qualitative comments and an ANOVA were conducted to determine what FSG participants learn from one training session and if they felt that one training session was enough. The ANOVA was not significant, F (1,23) = .15, p = .70. This showed that FSG were equally comfortable with the sufficiency of a single session. This finding was consistent with the written comments on the survey question *Did one training session cover enough material?*

The following comments are from participants who felt that one session was enough to learn SMART Board interactive whiteboard features:

- § The Notebook™ software and floating tools will be helpful features to record what changes have been made and obtaining easy access to SMART Board interactive whiteboard features (female).
- § Good overview of general features such as tools for SMART Board interactive whiteboard and Notebook software (female).
- § After learning the features, I know that I need to practice, practice, and practice to become proficient (female).
- § Yes, I thought that operating Excel & Word on the SMART Board interactive whiteboard was most useful to me (male).

- § The session covered enough of varied material to be helpful and get started, but it did not bog you down with too much information (male).
- § I learned that the platform is user-friendly (male).

There were only two participants (both male) who felt that an additional session was needed. Their comments included:

- § Session provided basic information. I need personal practice and then another session to answer questions and explain uses for more advanced applications.
- § Actual presentation reinforces the learning of the SMART Board interactive whiteboard, but there is a time limitation, so it would be difficult to implement.

Research Question Six:

An ANOVA was used to determine if the pedagogy used in the training session affected what participants learned. The ANOVA was not significant, F (1, 23) = .23, p = .63. These results demonstrate that FSG felt that the pedagogy was equally effective and that all participants learned the information regardless of gender.

Research Question Seven:

An ANOVA was conducted to determine if there were gender differences in the use of the SMART Board interactive whiteboard in instructional settings. The ANOVA was not significant, F(1,23) = .96, p = .34, demonstrating that all FSG equally considered the use of the SMART Board interactive whiteboard in instructional settings.

Research Question Eight:

A final ANOVA was utilized to detect potential gender differences in FSG perceptions of the advantages of using the SMART Board interactive whiteboard to

promote teaching and learning. The ANOVA was significant, F (1,23) = 5.18, p = .03. These results show that FSG had different perceptions SMART Board interactive whiteboard teaching/learning advantages and that male FSG were significantly less likely to report advantages than female FSG.

Limitations

This study had several limitations that should be taken into consideration when generalizing the results to a larger population. First, the sample size of this study was small (26 participants). In a true descriptive study, the sample size should contain 35 minimum. Additionally, the participants were volunteers in a convenience sampling (they happened to attend the sessions) that could cause response bias. Finally, four different researchers performed the observations and this caused an inter-rater reliability problem in the behaviors assessed on the observation checklist. The raters were positioned in different corners of the training room and did not have the same visual perceptions of the participants. Altogether, the limitations need to be considered in the assessment of study's validity, the analysis did reveal some important pilot findings that will be considered in our future studies.

Conclusions and Discussion

Gender differences in terms of participation in and the acquisition of SMART Board interactive whiteboard skills from attending SMART Board interactive whiteboard training sessions varied according to the question investigated. The first three research questions focusing on attendance, participation, and practice demonstrated female FSG domination. However, this may not be significant for participation and practice since more female FSGs did attend the training sessions, and therefore, it would be more than likely that participation and practice would be higher among the

female participants. The male participants did find the SMART Board interactive whiteboard to be less valuable in the instructional setting, but this response could be a result of their limited participation and practice or because they do not have access to such technology resources. Future studies investigate these differences as well as follow-up in the participants' classrooms and/or work environment.

There were no differences between the genders in terms of comfort level, instruction given in the training sessions, and the desire to use the SMART Board interactive whiteboard in the future. Researchers conclude that positive progression toward integrating SMART Board interactive whiteboards into the educational environment will occur. Based on the SMART Board interactive whiteboard's user-friendly features and advantages as perceived by most of the participants, this emerging technology can have a widening impact upon educational instruction.

Several recommendations need to be considered in further studies. First, a larger sample should be assessed. Several more training sessions should be conducted to better represent the faculty, staff, and graduate students' perceptions toward the SMART Board interactive whiteboard. Second, a qualitative study that follows the participants outside of the training session to observe how and whether the participants pursue the use of the SMART Board interactive whiteboard should be done. This would extend the existing results beyond the training sessions. Third, investigating particular features or interactive components of the SMART Board interactive whiteboard across the two genders would be worthwhile. For instance, a study could investigate how gendered interactivity affects the use of the SMART Board interactivity in the classroom. Finally, providing participants with a follow-up training session after they actually practice using the SMART Board interactive whiteboard could generate very different results. In short, this initial study has provided an idea of how gender

perceptions toward SMART Board interactive whiteboard use and integration differ. The next step is to take these results and obtain additional feedback from a variety of FSG in terms of SMART Board interactive whiteboard use.

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Survey for Participants in the SMART Board Interactive Whiteboard Workshops

Status:	Faculty	Staff	Graduate	Undergraduate										
Gender	: Male	Female												
Experie	xperience with SMART Board interactive whiteboard:													
N	ever used	Used a little	Used 6	extensively										
Years a	t USM:													
Major fi														
Minor fi	eld:													
the fol		ents using the	e following ke	l interactive white y: (1 = strongly o gree)										
	1. After attending this session, I would most likely attend future SMART Board interactive whiteboard technology training sessions.													
	2. For learning to essions is requir		ned, attending	follow-up technolog	y-training									
	3. One technolog lisadvantages of	, ,	on is enough to	learn the advantag	es and									
	l. One technolog echnology in act	•	•	learn how to apply	the									
	•			nology to me (e.g., nough to get started	•									
	b. Once I learn he he technology ca		ology, I tend to	o explore on my ow	n to see what									
	7. I did not feel	intimidated duri	ng the training	session.										

Please rate your perception of the SMART Board interactive whiteboard in the following statements using the following key: $(1 = \text{strongly disagree}, 2 = \text{disagree}, 3 = \text{not sure}, 4 = \text{agree}, 5 = \text{strongly agree})$
8. Before actually using the SMART Board interactive whiteboard, attending this training session has helped with my comfort level.
9. The training session has helped build my self-confidence in applying the SMART Board interactive whiteboard.
10. Personally, learning how to use technology requires that I practice using the technology.
11. Asking questions during training sessions can help stimulate learning.
12. Hands-on activities should be used with the participants to inspire learning.
13. If a training session involves a topic that I am unfamiliar with, I tend to sit and observe rather than speak out and participate.
14. Watching someone demonstrate technology features is the best method of learning how to use that technology.
15. A technology-training workshop should require participants to become actively involved with the instructional process.
16. A discussion session after the demonstration helps reinforce the information learned.
17. A technology training session should not exceed one hour in length.
18. The SMART Board interactive whiteboard has value in a classroom situation.
19. The SMART Board interactive whiteboard can be an effective instructional tool.
20. The SMART Board interactive whiteboard can benefit the user in communicating ideas and information.
21. Students who have difficulty following oral lectures can benefit through the SMART Board interactive whiteboard medium.
22. The SMART Board interactive whiteboard provides instructors and presenters with an alternative way to communicate information to the audience.
23. The SMART Board interactive whiteboard effectively provides a visual means for delivering information.

Board interac	can actively par tive whiteboard		

* Name three things that you have learned as a result of this SMART Board interactive whiteboard training session:
1.
2.
3.
* Name two ways in which instructors and presenters can effectively utilize the SMART Board interactive whiteboard:
1.
2.
* Do you feel that this training session has covered enough material that will help you apply it in your own instructional/workplace situation?
a. If yes, then please explain what information has been most useful.
 b. If no, please tell us what information we should have covered that would help you.
* Could you suggest ways in which the presentation of the material could be more effective?

Appendix B:

Observation Checklist

Workshop Date: Time: Number of Attendees: Presenter:

Recorder's Name:

Participation																	
Asks Question																	
Comment on observation																	
Actively takes notes																	
Volunteers	Ш															Ш	
Talks to each other-F & M	Ш															Ш	
Talks to each other-F & F	<u> </u>															<u> </u>	
Talks to each other-M & M																	
Attentiveness																	
Nods in agreement																i	
Looking at handout																	
Jokes appropriately																l	
Laughs/Smiles appropriately	\prod															i I	
Looking at watch																	
Shifting in chair																	
Yawns																	
Looks away																	
Miscellaneous																	
Leaves session early	Ш																
Leaves room right after session ends																	
Stays after session																	