Developing Self-Directed Learners and Teachers as Facilitators with SMART Board Interactive Whiteboard Technology

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Purpose

The objective was to facilitate students in the use of the Internet in self-directed learning projects and to develop their presentation skills. Would the use of a SMART Board enhance student motivation in self-directed learning projects and aid teachers in their roles as facilitators?

Background

Current research supports our goal of facilitating students to become self-directed learners. Hiemstra, in 1998, defined self-directed learning as any study form in which individuals have primary responsibility for planning, implementing, and evaluating the effort. It was also found that most people when asked proclaimed a preference for assuming such responsibility. Successful independent learning programs are examples of the process of engaged learning. According to the North Central Regional Educational Laboratory, engaged learning should be challenging, authentic, interdisciplinary, and performance based. We believe our Enhanced Learning Program offers the opportunity for our students to experience self-directed learning that meets the high standards of engaged learning. Students are encouraged by teacher facilitators to pursue a subject that is challenging, is cross-curricular, has real-life applications, and is evaluated by a performance assessment.

Our goal of using technology in the Enhanced Learning Program, especially the SMART Board, is supported by current research. An article from the October 4, 2000, NCEA Technology Newsletter, "Tomorrow's Schools Today: Integrating Technology into the Catholic Elementary/Middle School Classroom," states the philosophy with regard to software that "less is more." Choices in software should include productivity software such as word processing, database, spreadsheet, paint/draw programs, and multimedia software. We are striving at St. Joseph to provide opportunities for our students to develop technological skills useful in life. The SMART Board is a tool that will provide our students with these opportunities. The NCEA supports the philosophy that "technology should be used as a productivity tool used in every subject." The SMART Board is a tool that will be used by students in our Enhanced Learning Program to produce their final presentations and by teachers to facilitate this process.

Requirements of the Enhanced Learning Program include developing questions of interest to research and a final presentation of what is learned. This program allows students to pursue areas of interest using the Internet as a resource and the SMART Board as a final project presentation tool. Our reason for using this tool is to motivate the students to take charge of their learning. The SMART Board allows teachers to facilitate hands-on opportunities for students in the development of their self-directed learning projects and technological skills. This tool will also help classroom teachers in the presentation of the skills needed to do research and complete a final presentation.

Method and Results

Two groups were created from the Enhanced Learning Program. Group A consisted of eight students who were to do a self-directed project on a topic of their choice utilizing technical tools already in place, such as Internet access, PowerPoint, Word, and an LCD projector, *and* the SMART Board technology for their presentation. Group B consisted of eight students from the self-directed project who would use only the technology already in place.

Data was collected from pre- and post-student-interest inventories, teacher-interest inventories, journals and feedback from a post-project meeting with students and teachers. The project lasted nine weeks. Students met with the facilitating teacher once a week and at other scheduled times. All students had access to computers, the Internet, and other research tools. Students in Group A also had access to the SMART Board.

Student Interest Inventory for Advanced Learning Program
(Pre & Post Project Results)

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1	2	3	4	5

	Students Group A		Students Group B	
	Pre	**Post**	Pre	**Post**
1. I believe much can be learned through self-directed projects.	1.6	**1.4**	1.7	**1.9**
2. I am comfortable doing a self-directed project.	1.6	**1.3**	1.9	**2.1**
3. I am confident in my skills to speak and present information in front of a group.	1.6	**2.1**	2.0	**2.1**
4. I am confident in my Internet and computer skills to do research.	1.6	**1.6**	1.6	**1.3**
5. I am not afraid to use new technology or computer applications.	1.6	**1.6**	1.6	**1.4**
6. Using technology motivates me.	2.4	**2.1**	1.7	**2.4**

Teacher Interest Inventory for Advanced Learning Program
(Pre & Post Project Results)

	Teacher A		Teacher B	
	Pre	**Post**	Pre	**Post**
1. I am able to facilitate self-directed learning projects.	2.0	**1.0**	2.0	**2.0**
2. I am confident in my technology skills.	2.0	**2.0**	2.0	**3.0**
3. Technology should be a part of the self-directed learning process	1.0	**1.0**	1.0	**1.0**
4. I am not afraid to learn new technology or computer applications.	5.0	**1.0**	1.0	**1.0**
5. I believe technology is an integral part of the teaching process now and in the future.	1.0	**1.0**	1.0	**1.0**
6. Using technology motivates students.	1.0	**1.0**	1.0	**1.0**

Pre-project Inventory Results
The results showed that the students felt confident enough in their abilities to be successful in the self-directed learning project. There was little statistical difference between Group A and Group B, with the exception that Group A felt using technology was less motivating than students in Group B. This fact may be significant as to whether our original objective will be met – "Will the use of a SMART Board enhance student motivation in self-directed learning projects?" The only significant result from the teacher pre-project inventory was that Teacher A strongly disagreed with the statement, "I am not afraid to learn new technology or computer applications."

Post-project Inventory Results
The results from Group A (SMART Board group) showed students improved their high

expectations in regard to what can be learned through self-directed projects and their comfort level doing self-directed learning. There was no change in their opinion of the statements, "I am confident in my Internet and computer skills to do research" and "I am not afraid to use new technology or computer applications." The authors feel this indicates that the SMART Board is user friendly because the students did not feel intimidated by having to learn a new technology application in a short period of time *while* embarking on a new learning approach. There was a less positive response in relation to their confidence in their presentation skills, as demonstrated by statement 3 on the student-interest inventory. After doing a formal presentation, the students now realize what it entails to get up in front of a group, which includes teachers and administrators. As later stated from journal entries, the students were apprehensive and worried about this aspect of the program. The students indicated more agreement with the last statement, "Using technology motivates me." This seems to affirm the original question, "Will the use of a SMART Board enhance student motivation in self-directed learning projects?"

Students in Group B were not as positive, moving from strongly agree to agree, after the self-directed learning program as they were at the start of the project. They indicated they were less comfortable doing self-directed learning projects and felt less positive that much can be learned through self-directed learning. Although Group B students indicated more confidence in their Internet, computer skills, and their ability to learn new technology or computer applications, they indicated on the post inventory that technology motivates them less.

Students overall maintained a positive attitude during the Enhanced Learning Program. Group B student post-project results for statement 6, which states, "Using technology motivates me," indicated a move toward the disagree end of the scale. The authors believe that a possible reason for this change is supported by comments from the students during the post-presentation discussion. The students in Group B, after viewing the polished presentations by students in Group A, felt their presentations lacking. Group B students described the SMART Board presentations as "slick." From their comments during the presentation and in the post-project meeting, Group B students indicated dismay that Group A had the benefit of the SMART Board. It was only *after* the presentations that students in Group B saw how the SMART Board was capable of enhancing a presentation, and this may be the reason there was a move toward "disagree" for question 6 on the post student inventory. In their comments, the students also indicated a lack of enthusiasm for the technology presently available to them.

Teachers A and B both agreed before and after the project that technology should be an integral part of this program and all student learning. During the presentations, Teacher B indicated a desire to learn the SMART Board, and this may be the reason she showed less confidence in her technology skills after the presentations. Teacher A indicated greater confidence about facilitating self-directed learning projects after the presentations. Like the students, Teacher A maintained her high expectations throughout the project. However, in response to the statement, "I am not afraid to learn new technology or computer applications," Teacher A indicated after the post inventory that she mismarked her earlier response. She meant to mark "strongly agree" with this statement in the very beginning. The authors conclude that using the SMART Board to facilitate student learning is not intimidating.

Student Journal Anecdotes

The students recorded their progress and feelings once a week, keeping the information on a floppy disk that was reviewed by their facilitator each week and by the authors at the end of the project. Some students were more forthcoming with their feelings than others. Below are excerpts that relate to the use of the SMART Board.

The following entries are the words of the students, but the entries were condensed to reflect their experience with the SMART Board. Some information was not included because it was not related directly to this purpose. The students reviewed these excerpts and approved them for meaning.

- Last Friday, the 12th (January), I worked downstairs with my teacher and a few other people on the SMART Board. We learned how to set it up and how it works. We also learned how to take it down. We asked for more time during Reading and Religion class.

- This week I have been working to completely understand the SMART Board and how it works. Today I got on the Internet and I found a website that had a lot of good information and subtopics that were very helpful in finding the information that I have been needing. On Tuesday I am going to Topeka to serve as a page for Senator Nick Jordan.

- This past week I have been doing more research than before…I haven't been using the SMART Board very much this week because I'm pretty comfortable with working with it and knowing how it works. I also haven't been using it much because reading books and taking notes on them is somewhat time-consuming.

- On Wednesday, my teacher helped me work on my PowerPoint presentation…I am very comfortable using the SMART Board. I am going to work on my PowerPoint presentation some more today and hopefully finish it.

- This week I finished my Power Point presentation and edited it. I also showed a few people my presentation and my sister helped me edit my note cards that I am going to read off of during my presentation. I pretty much have my project completed...I am planning to incorporate the SMART Board into my presentation by drawing on and circling things on the pictures that I have in PowerPoint. I helped Zack put together his Power Point by showing him how to make a slide and change the colors to create a presentation using the SMART Board.

- Microsoft PowerPoint is being used for my presentation, so that was really helpful, but it was kind of hard trying to not overuse one sound or movement and make it just right. And finally, of course, the SMART Board is key to my presentation to enhance it. I have learned that Monet painted things at different times of day, seasons and different weather…I have learned that it isn't easy to use PowerPoint, and that I need to write down my sources. I am enjoying it, except I need someone to show me how to set up the SMART Board…Well a negative is that since I do my project alone, no one showed me how to use the SMART Board, but a positive is that I have the SMART Board all to myself and no one can bug me.

- I think that it was cool that I got to use the SMART Board. It made the research project more interesting…I really liked how easy it was to use the SMART Board. I think that it definitely enhanced my presentation. I really hope that we get to keep the SMART Board. I would not even mind doing a research project that much if I could use the SMART Board…I learned a lot about my project topic, how to use the SMART Board, and I learned about other people's project topics.

- Please try to make sure that we keep the SMART Board!!!!

- I have used the SMART Board a little bit to learn about it…I have completed setting up my web site and am now entering information…I have enjoyed working with the SMART Board because you can draw and type on it with your fingers. I think the SMART Board motivates me to work harder because I have new technology to help me with the work. I will be ready to present on Friday.

- Today I did my presentation and I think it went well. My project was fully completed. This was a good learning experience for me. Using the SMART Board was neat and new to me…I wish I could do this again next quarter under a different topic maybe.

- Today we all gave our presentations and I feel so much better now because I was nervous about getting up and talking in front of other people. I sometimes get that way. I really enjoyed using the SMART Board. I didn't enjoy doing the research very much. I also enjoyed learning how to make a PowerPoint presentation. I would like to do this again if I got the chance.

Facilitating Teacher Responses

- The students seem to like the idea of using the SMART Board. I know that they have spent time working with it. I also know that they get pretty upset when their facilitator is absent because they can't work with it. I have had to remind them to do some research as well as learn the SMART Board…Everyone else is doing great. They love pasting from the Internet to Word rather than printing things. They finally figured out how much easier it is to save pictures and then put them into their SMART Board presentation instead of trying to re-find what they want…They are so excited about the SMART Board! I have to remind them that they need to be doing research as well as practicing on the Board. My group seems to have settled down a little bit…The students are doing very well. They are very excited about using the SMART Board. They are sharing bits and pieces with me, but I'm still having a hard time getting them to turn in their disk to me…

- We just finished with all of the student presentations. Most of them were remarkable. I can see that they learned a lot about both the subject matter and the technology. The students who used the SMART Board had very polished presentations. This could be due to the fact that they spent more time learning how to work the SMART Board because it was fun and new to them. I do know that they enjoyed the SMART Board and enjoyed showing off their skills. Tyler kept pulling me aside to show me what he could do. If the teachers' reactions were any indication, the SMART Board will be very popular among the staff as well as the students.

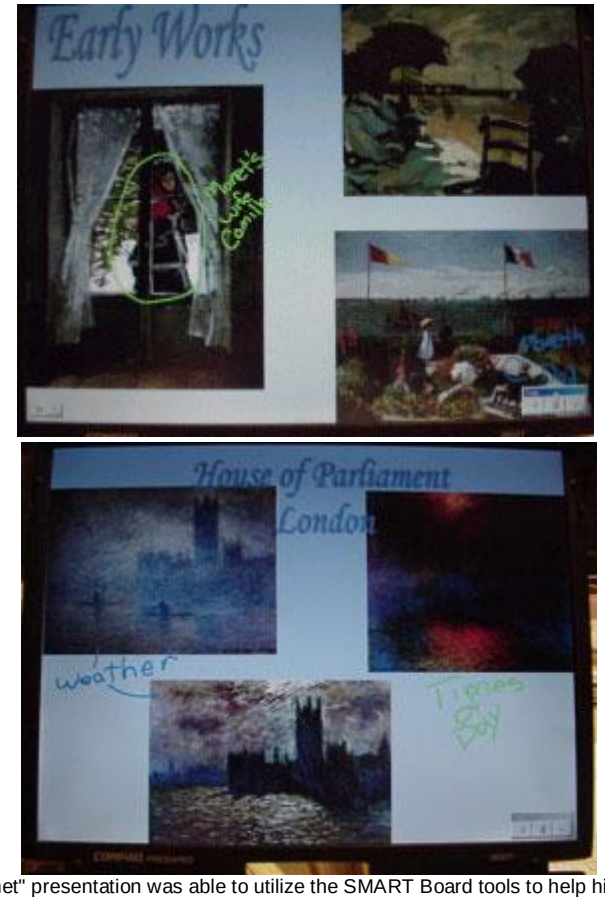
- Wow! The SMART Board is so cool. I wish Chris could have been part of the SMART Board group because he had a very detailed PowerPoint presentation and the SMART Board could have given his presentation more polish by adding visual enhancements… his project about the digestive system by nature doesn't appeal to most people!

- The SMART Board is a vehicle that might encourage kids to see past e-mail as the only use of the computer that applies to them personally

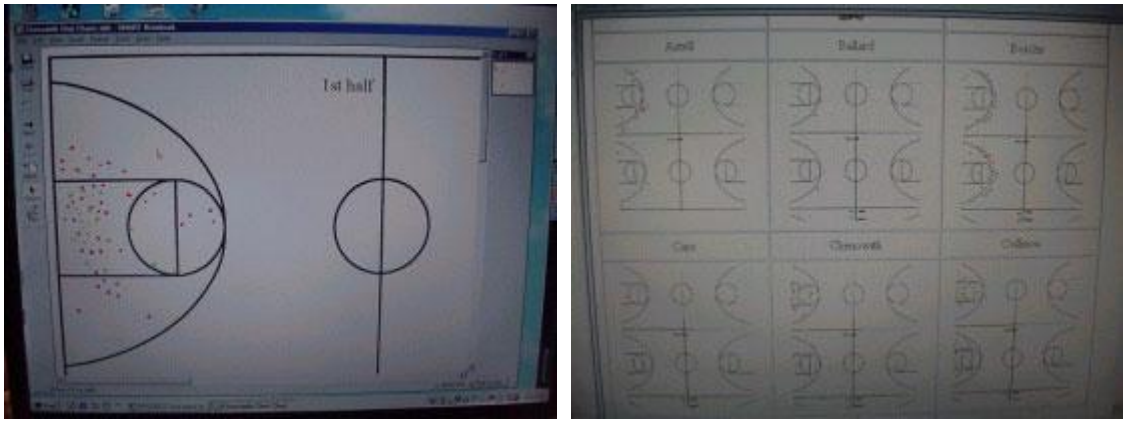
One student demonstrated how she presented her information using the SMART Board.

The SMART Board made sharing information easier because the SMART Board allowed a large group to see and touch. To be able to manipulate applications in this manner is a creative and intense learning experience.


In Group A, students learned the SMART Board application by teaching themselves and each other. In fact, they taught the teachers!



One student during her "Monet" presentation was able to utilize the SMART Board tools to help highlight and identify aspects of her presentation.



The SMART Board allowed one student, who wanted to construct a Web site for his favorite college team, collect, compile and analyze volumes of data using SMART Notebook. As an example, Notebook was used to construct shot charts for all 14 players for the entire 16 conference game season.

Final Presentations

On March 9, 2001, the final projects were presented to the Enhanced Learning students, along with the seventh grade facilitators, the Principal, the Assistant Principal, and the technology coordinator. Group A used the SMART Board as their primary presentation tool while Group B used other presentation tools such as overhead projectors, PowerPoint, and demonstrations.

Projects included topics from technology, fine arts, language arts, and science. Technology applications used were Internet research, Microsoft Word, Excel, PowerPoint, HTML, and SMART Notebook. All technology applications were used as creative tools. The students were able to use these applications across the curriculum for subjects as diverse as science and fine arts. The students were allowed to use all the "tools" they wanted. There were no limits placed on their creativity.

During the presentations the "audience" asked the students again and again to demonstrate the SMART Board's abilities. In fact, one teacher asked to try her hand at using the Board. Probably the most significant event that occurred during the presentations was a student from Group B (students not utilizing the SMART Board) who, after watching several SMART Board presentations, got up and did her presentation on the SMART Board. She was able to learn enough about its use from former presentations to utilize several of its features during her PowerPoint presentation. The authors believe this demonstrates how motivating and user-friendly the SMART Board can be.

Culminating Group Discussion/Evaluation

Following the presentations, the authors met with all of the students in the Enhanced Learning Program. We asked them for their feedback about the program. We asked them the following questions:

What are your overall feelings about the Enhanced Learning Project?

The students liked being able to do what they wanted without being told what to study. They liked picking their own topics. They liked being able to draw on the SMART Board; it allowed creativity and flexibility. They could work at their own pace, decide their own schedule, and experience what it was like to be an adult.

What specific skills did you learn through this project?

The students learned more about the computer itself as well as how to gather information and organize data. Presentation skills were improved. Students learned to take more time planning at the beginning. Better technology skills were acquired through using PowerPoint, Front Page, HTML, and SMART Notebook. The students learned by watching and helping each other. They learned to manage time and meet deadlines. They now think we need more than one SMART Board. As a result of this project the students learned to interact with teachers as facilitators and mentors.

Conclusion

The authors feel confident that these students are equipped to continue independent learning because of this project. They have learned to do research via the Internet; select, organize, and interpret information; manage time; present information; and work with teachers and peers. They now have realistic expectations about what a polished presentation requires.

The enthusiasm shown by the students in Group A (SMART Board Group) was evident throughout the project. They worked together to learn and teach each other the SMART Board and other applications. This was the first experience some of the students had using HTML, FrontPage, and PowerPoint. The SMART Board facilitated this learning process because it is a hands-on tool. The SMART Board was the tool that brought teachers and students together. It was a new experience because the SMART Board allowed a role reversal with the student becoming the teacher. Students in Group B are looking forward to their turn with the SMART Board.

The SMART Board has created an "educational crisis" here at St. Joseph School because now hard decisions will need to be made as to how the SMART Board will be shared. By acquiring this new technological tool to enhance our program, we also gained new insight about how to better facilitate independent self-directed learners. We thrive on the challenge to keep students and teachers abreast of what technology has to offer.

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