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Research Proposal

The Effect of a Student-Created

Enduring Understandings Wall

on Long-Term Retention, Transfer of Concepts and

Perceived Understanding

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Abstract

This is a proposal for a study to examine the effect of having students produce, organize and create a cognitive learning map and a wall of Enduring Understandings on long-term retention of concepts and transfer of knowledge. In addition, the study will look at the students' beliefs about how well they understood concepts, and whether the cognitive learning map and wall of Enduring Understandings did/did not assist in their understanding and retention of the concepts. These methods are modifications of the Word Wall method and KWL teaching method.

Despite having read a fair amount of research about the importance of using the physical space of the classroom in assisting in instructional practice, particularly in the literacy classroom, I have never looked at the ramifications of having students claim ownership of that use of the physical space, versus the teacher driving the usage. I have always employed techniques that involve plastering the walls with concepts and words. I have copies of the state standards on the wall that I refer to in my teaching, as well as the de rigeur Word Wall. In fact, the Word Wall has been an integral part of my classroom, whether I am teaching English or science.

In addition, I have also done a fair amount with having students look at what they know about a subject as a way of structuring their learning about a new topic. This method is the KWL method, named as such, because the students discuss and write about what they *know*, what they *want* to know, and after reading, what they have *learned*. I first became a fan of this method after reading being introduced to Reading Apprenticeship, a method developed by some teachers in California that involved getting students to think about their learning process (Schoenbach, Greenleaf, Cziko and Hurwitz, 1999).

Making the concepts and the learning literally visible is something I know about. However, despite having employed both the Word Wall and KWL techniques for many years, I have never looked at the possibilities of having the students create and maintain the concepts that are posted. While I also know that having students feel a sense of ownership over their space and their learning gives them a feeling of efficacy, and in turn, a greater desire to learn (Ennis and McCauley, 2002, p. 164) (Branch, Grafelman and Hurelbrink, 1998), I have never put the two concepts of visible learning and student-ownership together.

The purpose of this study is to see what happens when students are called upon to map their learning process, develop a list of Enduring Understandings at the end of the unit, and create and maintain a concept wall upon which they will post the Enduring Understandings. The two things that will be examined are the students' long-term retention of concepts and the students' ability to transfer knowledge and understanding between related concepts and tasks.

<div align="center">RATIONALE</div>

I have observed that my students have difficulty retaining the concepts they have learned from unit to unit, and have equal difficulty with transferring key concepts from one unit to another. For many, once a unit is finished, the knowledge contained therein becomes, in their minds, useless. (Leonard, Gerace and Dufresne, 1999).

It is my hope that having students perform metacognition around their learning progression and having them create a space in the room that reflects this metacognition will result in the students experiencing a feeling of increased efficacy, as well as an increased retention of learned knowledge for a longer period of time, and increased transfer between concepts. An increase in retention and transfer should, in turn, increase the students' critical

thinking ability in the long-term, and also assist in their performance in future science classes. (Katz, 1996).

RESEARCH QUESTION

Will having students map their learning process throughout the teaching of a set of learning objectives, followed by development of Enduring Understandings that remain visible in the classroom, increase students' feelings of efficacy, and in turn, increase student retention and transfer?

CRITICAL TERMS

Word Wall

An area of the room devoted to the posting of vocabulary, usually with the intent of increasing literacy (Brabham and Villaume, 2001). In secondary education the vocabulary can be a combination of Tier II (words not commonly used) and Tier III (words that are subject specific). The word wall can be teacher-generated, but is often more effective as a student-generated activity (Vallejo, 2006).

metacognition

The process of examining and discussing one's cognitive processes. This has been shown to be effective in assisting in improving students' literacy skills (Schoenbach, Greenleaf, Cziko and Hurwitz, 1999). It has also shown to have a positive effect on retention of concepts (Blank, 2000).

Enduring Understandings

Statements that express a large idea or broad concept that, if understood, help to build understanding in other areas of the given subject. This is one approach to the concept-based vs. content-based pedagogy of instruction. Concept-based instruction is instruction that looks at

concepts that can be used to establish an understanding of facts, whereas content-based instruction teaches the memorization of facts and figures. Lord and Orkwiszewski, in their article, "Didactic to Inquiry-Based Instruction," suggest that students who learn through inquiry about concepts, rather than through rote memorization of facts are more successful in learning science (Lord and Orkwiszeski, 2006, p. 344) even traditionally difficult subjects, such as physics (Leonard, Gerace and Dufresne, 1999). This can be particularly true of students whose learning seems to have flat-lined while using the more traditional fact-based approach (Clark, 2005, p. 59).

KWL

Usually used as a literacy tool, this is an activity where students are required to complete a graphic organizer with a discussion of what they <u>K</u>now, what they <u>W</u>ant to know, and after reading, what they have <u>L</u>earned. This is meant to help the students focus on unfamiliar pieces of information, as well as apply newly acquired information to a specific thought. It is an example of metacognition (Szabo, 2006).

<center>PARTICIPANTS AND CONTEXT</center>

Overbrook High School is an urban comprehensive high school, in the West Region of the School District of Philadelphia. Our population is largely made up of students that live in the neighborhoods in West Philadelphia, and who come here as automatic admits after attending a neighborhood middle school. Our typical enrollment is between 1600 and 1800 students. Of this population over 14% are receiving special education services, 98.5% of the students are identified as African-American or Caribbean-American, and all receive free meals, since we are a Title I school.   The majority of our students score well-below state and national averages on state and national assessments.

As with many urban schools, our budgetary restrictions are extreme, and our physical plant is crumbling. We do not have properly functioning science labs, access to computer technology is limited to the computer labs, and our science equipment ranges from merely old to obsolete. Furthermore, the wiring in the school is so old (from the 1920s), even if we did have access to more computers, placing them in the labs and classrooms would result in shorting out the electrical systems. Unfortunately, due to the budgetary restrictions, we are unlikely to be able to fix any of these strictures in the near future. Subsequently, we must be very creative when it comes to teaching lab sciences to our students.

The students who will be participating in this research are juniors in the Scholars Academy. These tend to be the most academically-minded of the students in the school, and are the ones who are tracked for the honors and AP classes. On average, their performance on state and national assessments tends to be better than the overall school's performance, but is still lower than state and national averages. Again, individual students do quite well, but the overall academic level is still below that of other parts of the country. I will be teaching them in an Environmental Science class, a subject that is normally offered to seniors, but which is being offered to these students as a response to the high level of Environmental Science content in the state assessment.

THEORETICAL BASIS

The research being conducted will be mostly qualitative, though I will include some qualitative data in the form of test scores. Much of the information I gather will be obtained via interviews and small group discussion with the students. I will also be collecting test score data, and conducting surveys and self-reflective surveys. These will be largely for getting "larger

picture" views of the class's thoughts and reactions to the methods, as well as to give some focus to the information gathered in the interviews and discussions.

METHOD

Teaching Technique

The method can be viewed as a modified KWL technique—perhaps a KWL on steroids. The method consists of two parts, the Knowledge Map and the Enduring Understandings Wall. Both are student-generated and are published by posting in a special location on the classroom wall. The Knowledge Maps are published for the duration of the unit, and the Enduring Understandings Wall is permanent for the duration of the course. The Knowledge Map and the first step of the Enduring Understandings activity will be completed in groups of four. The finalization of the Enduring Understandings and the construction and maintenance of the Enduring Understandings Wall will be done as a whole-class activity.

The Knowledge Map is a metacognitive activity that is meant to get the students thinking about what they know vs. what they need to learn. At the start of the unit, before any instruction takes place, I will hand out a list of questions that each group must then organize into a Knowledge Map. I will establish the group members, and the group memberships will change at the start of each unit. Each member of the group will be assigned a color (red, blue, green or purple) which will be used for all work that will become published, such as the Knowledge Map.

The Knowledge Map will be split into three columns. One column is for the questions. The second column is for answers they are sure are correct. The third column is for answers that they are unsure of, and for which they need more information (see example).

Questions	We are sure of these answers . . .	We need more info for these answers . . .

Each group must complete the chart by writing the questions and placing their answers in the appropriate columns. As the unit progresses the groups will have opportunities to revisit their Knowledge Map and change any answers, and to move answers from one column to another. For each change made, a brief explanation must be written and appended to the changed answer. The explanation will discuss how the group's answer changed from the previous version and why the group decided that the answer had to change columns. The explanation is required, so that the group can track their learning process through the unit.

At the end of the unit, before the unit assessment, each group will produce a list of Enduring Understandings (EU)—generalized statements that address a concept learned in the unit.   These will then be shared with the class and posted on the wall. For the first lesson or two I will model several Enduring Understandings, while the students write the rest. For the remainder of the units the Enduring Understandings will be completely student-generated. If there is an Enduring Understanding that I would like the class to have, but which the students have not created, I will give an additional activity with the purpose of, hopefully, guiding them to recognize the additional concept. I will make note of each of the times I am required to do this, to see if there is a detectable pattern and cause for the "lost" concept.

At this point, I will give the end-of-unit assessment. Part of the end-of-unit assessment will be a section that asks questions that address material from previous units. After the unit assessment the class will discuss the EUs produced by each group, and come to a class consensus on which will remain on the wall, which should come down, and which can remain after some revision. After the process is complete, the wall will be edited, and the unit will come to an end. However, the idea is for the EUs for each unit to become groundwork for the following units.

Since this will be a qualitative study, I will conduct most of my research through interviews with students. I will choose the students by examining the answers to surveys that I will be giving in which they will self-assess their attitudes about learning the subject as a whole, the content of the unit, their perceived performance on the assessment and their general understanding of the subject. The survey will be given before a unit begins and when the unit ends. In addition to having small-group discussions about the content of the class, and interviewing specific subjects in the class, I will track their test scores to assess retention and ability to transfer concepts learned in previous units to subsequent units.

CLOSING THOUGHTS

Again, I have always posted where the students are going, and had word walls in all my rooms, but this will be the first time where the students map the direction themselves. I found last year (my first year teaching a science class) I had a lot of problem with having students retain knowledge and see connections between units. I am hoping this is a way to make that process a little more concrete for the students, and in so doing, I am hoping the increase in the concrete nature of the process will help them to retain the knowledge more easily, and transfer more readily.

Further, I am hoping that the students active ownership of the process will help them to feel more in control of the learning process, which will, in turn, reflect positively on that very learning process.

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