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Public Opinion Survey

An Integrated Unit

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South Portland Public Schools

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Reflections of Dimensions of Learning on Unit Design

The Public Opinion Survey Unit was developed for an advanced math team and was designed to provide a relevant and challenging, integrated math experience for gifted mathematicians.

Inspiration for the project came as a result of the local school consolidation plan that was on the November ballot in South Portland. The question asked voters to approve spending $25 million to build additions to four elementary schools, including Small School. The issue was one of high interest to the children and their families and it provided an excellent opportunity for them to become involved in a meaningful community debate.

The goal of the unit was to collect and analyze mathematical data to predict the results of the school consolidation referendum. Students began the process by studying the issue through discussion with their teacher and parent mentor, reading local news reports and election related material, and interviewing their parents and other adults.

The next step was for students to acquire knowledge about surveys and polling strategies. This was accomplished by attending workshops provided by the parent mentor and examining surveys in the newspaper. Students had previously conducted simple surveys of friend's favorite activities, hobbies, music, etc., and they were asked to draw upon that prior knowledge as they began a more complex data gathering task. The students learned how to compose questions that would provide analyzable data, decided upon relevant questions to ask to predict the election outcome, and learned about the concept of random sampling. This phase of the process was

exciting for them as they began to anticipate the outcome of their polling. The students brainstormed questions, narrowed them down to a manageable number, decided upon how to pose them to generate statistics, then learned how to use the Internet to locate names and phone numbers of South Portland residents who were geographically distributed. They were then ready to begin their telephone survey.

Once the students had created an introduction script, which they would use consistently, they spent some time role playing their phone behavior and learned appropriate phone manners from the parent mentor. Each child was assigned a list of names and phone numbers which were obtained randomly from the Internet. They conducted their surveys at home with parent supervision. The teacher taught them how to disable caller ID for safety and they were required to do so for each call they made. Each member of the team was asked to complete seven surveys.

The next phase in the process was the data analysis. Students brought in their completed surveys and used a spreadsheet program (ClarisWorks) to enter results for each question. They were able to enter the data independently once the process was modeled for them. The students also had to sort the completed surveys by various categories so they could analyze the data in a variety of ways. Once all of the totals were entered, the team was guided toward drawing conclusions from the numbers. Because of the large number of undecided voters, they also had to learn a formula for removing the undecided voters from the projection. The students completed their analysis and made predictions based on the data collected. The actual election results were consistent with their projections although they were 8 points off on their percentage.

The next phase was in packaging the data so it was visually appealing and meaningful to an audience. The students were given a demonstration on how to use PowerPoint presentation software to create a slide show. Since PowerPoint has built in spreadsheet and charting functions, it was the ideal way for the students to package their data for presentation. They learned the software quickly and had some rich discussion concerning the aesthetic quality of their presentation (i.e., what types of charts to use, colors of text, and clip art). This was an incredible process to observe. They completed the slide show and practiced their presentation to the media by presenting the results to classmates who were not involved in this project.

While team members were working on data entry, data analysis and the presentation, a group of students worked with a parent mentor on a press release. They wrote a summary of their project and contacted the media by phone. The results of this effort were visits from two television crews (Channels 8 and 13) and a reporter from the local daily newspaper. The students took turns making their presentation to the media. The team also had a visit from the Director of Instructional Technology from USM who wanted to see an example

of curriculum integration in the classroom. Once again they made their presentation.

The Public Opinion Survey proved to be a powerful task which integrated a great many new skills, processes and higher-order thinking. Student satisfaction was high and every child met or exceeded the standards which were established for various aspects of the unit.

Assessment

Assessment of the project came in several forms.

- Process observations and feedback by the teacher and parent mentors. Students were provided with standards for collaborative work prior to beginning the project and were given frequent feedback on their process.
- Assessment of skills using technology through observation.
- Assessment of communication skills through observation of formal presentations to the media, development of press releases, feedback from parents on survey behavior, script development.
- Assessment of mathematical concepts through observation of application to the final product.
- Assessment of Dimension 1 elements through student satisfaction ratings at the conclusion of the project.

Dimension of Learning Components

What follows are ways the project related to the Dimensions of Learning Model:

Dimension 1: Attitudes and Perceptions

Dimension 1 elements of the project included:

- The Excitement of working on a real-life election polling.
- Anticipation for the outcome of the election.
- Attention from local media.
- Working in cooperative learning teams.
- Excitement of learning new technologies.
- Sharing their results with their peers.
- Working with adult mentors.
- Affirmation of their projections by the actual results.

Dimension 2: Acquire and Integrate Knowledge (Declarative & Procedural Knowledge)

Helping students acquire and integrate new knowledge is another important aspect of learning. When students are learning new information, they must be guided in relating the new knowledge to what they already know, organizing that information, and then making it part of their long-term memory. When students are acquiring new skills and processes, they must learn a model (or set of steps), then shape the skill or process to make it efficient and effective for them, and, finally, internalize or practice the skill or process so they can perform it easily.

Elements of Dimension 2 include:

- Acquiring knowledge about the school consolidation issue.
- How surveys work: question types, random sampling techniques.
- Learning how to access the Internet for community databases.
- Learning to compose a script.
- Learn appropriate phone manners and calling behavior.
- Learn how to disable caller ID for safety.
- Learn how to complete a survey.
- Learn how to use spreadsheet software.
- Learned how to calculate percentages.
- Learn how to use PowerPoint presentation software.
- Learning how to convert data to visual images (graphs).
- Learning how to do a press release.
- Learning how to make a formal presentation.

Dimension 3: Extend and Refine Knowledge

Learning does not stop with acquiring and integrating knowledge. Learners develop in-depth understanding through the process of extending and refining their knowledge (e.g., by making new distinctions, clearing up misconceptions, and reaching conclusions.) They rigorously analyze what they have learned by applying reasoning processes that will help them extend and refine the information. Some of the common reasoning processes used by learners to extend and refine their knowledge are the following:

Comparing	Classifying
Abstracting	Inductive reasoning
Deductive reasoning	Constructing support
Analyzing errors	Analyzing perspectives

Elements of Dimension 3 include:

- Comparing the results of surveys from various cohort groups (age levels, person with or without children).
- Inducing the outcome of the election through analysis of the explicit data from the survey results.
- Analyzing perspectives inherent in the school consolidation debate through research and interviews.
- Abstracting through an understanding that results from sample populations can be generalized to a larger population.
- Classifying various cohort categories for data analysis, such as age groups and family status.
- Constructing support for projections based on data analysis.

Dimension 4: Use Knowledge Meaningfully

The most effective learning occurs when we use knowledge to perform meaningful tasks. For example, we might initially learn about tennis racquets by talking to a friend or reading a magazine article about them. We really learn about them, however, when we are trying to decide what kind of tennis racquet to buy. Making sure that students have the opportunity to use knowledge meaningfully is one of the most important parts of planning a unit of instruction. In the Dimensions of Learning model, there are six reasoning processes around which tasks can be constructed to encourage the meaningful use of knowledge:

Decision making	Problem solving
Invention	Investigation
Experimental inquiry	Systems analysis

Elements of Dimension 3 include:

- Making decisions on the division of labor, elements of the presentation design, and agreement on projections.
- Invention through presentation software design.
- Problem solving inherent in analysis of the data.
- Investigation of the issue and complexities of the political debate.

Dimension 5: Productive Habits of Mind

The most effective learners have developed powerful habits of mind that enable them to think critically, think creatively, and regulate their behavior. These mental habits include and all were implicit in the unit design.

Critical thinking:

- Be accurate and seek accuracy

- Be clear and seek clarity
- Maintain an open mind
- Restrain impulsivity
- Take a position when the situation warrants it
- Respond appropriately to others' feelings and level of knowledge

Creative thinking:

- Persevere
- Push the limits of your knowledge and abilities
- Generate, trust, and maintain your own standards of evaluation
- Generate new ways of viewing a situation that are outside the boundaries of standard conventions

Self-regulated thinking:

- Monitor your own thinking
- Plan appropriately
- Identify and use necessary resources
- Respond appropriately to feedback
- Evaluate the effectiveness of your actions

Learner Outcomes

Learner Outcomes involved in the project:

- √ Knowledgeable Person
- √ Collaborative Worker
- √ Critical Thinker
- √ Effective Communicator
- √ Involved Citizen
- √ Quality Producer
- √ Self-directed Learner

Teacher Reflection

This project was excellent. It would have been much more challenging to do without a parent mentor but not impossible. The only challenges were access to technology; we need more PCs in order to use time more efficiently. The media visits were somewhat disruptive because of the number; I would likely limit the press next time, or spread out their visits.

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