Evidence based practice (EBP) is the use of research, experience, and client/student factors in the provision of health care and education. Learning and employing EBP requires critical thinking and evaluation skills. Students learn best when they are actively engaged in learning cycles of exploration, concept invention, and application. David Hanson and colleagues, funded by the National Science Foundation, developed Process-Oriented Guided-Inquiry Learning (POGIL) to enhance science education and address the observed weaknesses of both lecture-based and problem-based learning. Specifically, lecture-based learning is passive, solitary, and limits responsibility for learning. Problem based learning has the weaknesses of 1) expecting content to be learned by novices who may not recognize important content and 2) requiring extensive facilitation to ensure that the problem-solving progresses effectively to desired outcomes (Gallow; Problem-Based Learning). POGILs were developed to facilitate the skills of information processing, critical and analytical thinking, problem solving, communication, teamwork, management, and assessment (Hanson, 2006). This strategy has been adapted in a variety of non-core science areas, such as marketing, healthcare, and humanities (Hale & Mullen, 2009).

BACKGROUND

Evidence based practice (EBP) is the use of research, experience, and client/student factors in the provision of health care and education. Learning and employing EBP requires critical thinking and evaluation skills. Students learn best when they are actively engaged in learning cycles of exploration, concept invention, and application. David Hanson and colleagues, funded by the National Science Foundation, developed Process-Oriented Guided-Inquiry Learning (POGIL) to enhance science education and address the observed weaknesses of both lecture-based and problem-based learning. Specifically, lecture-based learning is passive, solitary, and limits responsibility for learning. Problem based learning has the weaknesses of 1) expecting content to be learned by novices who may not recognize important content and 2) requiring extensive facilitation to ensure that the problem-solving progresses effectively to desired outcomes (Gallow; Problem-Based Learning).

OBJECTIVES

1. Describe POGIL, the collaborative learning format used in the Evidence-Based Practice class
2. Discuss pros and cons of using POGIL format with graduate students

POGIL FORMAT DESCRIPTION

POGIL activities are done in structured, collaborative small groups. They follow a defined Learning Cycle:

<table>
<thead>
<tr>
<th>E</th>
<th>Exploration</th>
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<tbody>
<tr>
<td>I</td>
<td>Concept Invention (Term Introduction)</td>
</tr>
<tr>
<td>A</td>
<td>Application</td>
</tr>
</tbody>
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Suggested group size is 3-5 students with specific roles assigned to each member per session:
- **Manager**: Manages the group; time-keeper; ensures participation in roles; interfaces with facilitator
- **Recorder**: Records names/roles of group; note-taker
- **Presenter**: Presents concise oral reports to class
- **Reflector**: Observes/Comments on the group’s performance
- **Additional roles might include Technician, Encourager, Fact Checker.**

POGILs can be employed as an adjunct or supplement to lectures, or as the primary method of teaching/learning with some supplemental mini-lectures. Written materials guide the process of the session, with in-class facilitation available. Presentations of group work and discussion clarify content. Sessions end with shared critical thinking questions.

POGIL FORMAT DESCRIPTION

Evidence Based Practice was taught in the first semester of the Occupational Therapy Program for 6 years using a traditional lecture-based format. During that time both instructors and students were dissatisfied with the course. To address this dissatisfaction and to increase active learning, we implemented POGIL strategies in the Fall of 2010 (1x/week for 3 hours) and continued in Fall 2011 and 2012 (2x/week for 1 ½ hours). We developed 12 modules on topics including: an introduction to evidence based practice, asking clinical questions, searching for evidence, the structure and use of scientific writing, APA formatting, levels of evidence, and appraising evidence from descriptive, quasi-experimental, RCTs, systematic reviews, and qualitative studies.

Each class had pre-assigned readings. In 2010 new groups were established weekly at the beginning of class; in 2011 and 2012 students remained in the same group throughout the semester. POGIL sessions would begin with the distribution of the packets. Students were expected to work through the instructions, moving from the basic content to the applied experiences by the end of the session.

Over the course of the semesters, faculty’s belief that the use of POGIL was an effective teaching strategy was reinforced through observation of the active engagement and written reflections from the students. Implementation in the second and third years was enhanced due to better structuring of the activities; a clear introduction of the benefits of the process on the first day of class; and clearer grading guidelines than during the first year.

The summary points listed in the next column would assist other faculty in using this method.

SELECTED REFERENCES


CLASS OUTCOMES

Overall, an increase in course satisfaction was evident between 2010 and 2011, but remained static in 2012. Comments and ratings revealed there is still room for improvement. Some students suggested having more explicit directions for the assignments and more mini-lectures before doing the active learning.

Student self-reports on knowledge and skill development were comparable both years, showing statistically significant improvement across the semester.

Student comments were more positive in 2011 & 2012 than in 2010. Examples:

- “I think the POGILs were a good way of helping us to retain the information.” 2010
- “It was interesting that when it came to the tests I felt like I knew the information well because we had worked with the information so much in class.” 2011
- “Prepared us to be better researchers. Group activities allowed us to work on collaboration and team work.” 2011
- “Having groups in class to work on assignments was a strength because it helped students learn more by seeing other student’s thought processes.” 2011
- “…It also helped with teaching me how to operate effectively within a group.” 2011
- “All of the hands on work was useful in learning the material.” 2012

SUMMARY POINTS

Preparing, Planning & Developing
- It is important to experience and study the POGIL method before implementing
- Faculty need to be creative and write clear task instructions
- Development requires appreciable initial time and familiarity with format
- Foster identification of essential elements of learning through graphics
- Introducing benefits of this learning method to promote student buy-in is critical

Challenges
- Student’s inexperience with critique and reflection
- Student’s perception of teaching/learning: “I feel like I have to teach myself. I pay you to teach me.”
- Environment not consistently conducive to small group work
- Process is multifactorial, thus difficult to draw causal relationships.
- Examining effectiveness of teaching strategy requires additional measures

Advantages
- Some students preferred this format to “Death by PowerPoint”
- Format appealed to adult preferences for active learning
- Self-assessment of knowledge trended higher across the semester

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