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Revisiting Group Consensus: Collaborative Learning Dynamics During a Problem-Based Learning Activity in Education

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Abstract: *Problem-based learning (PBL), especially in conjunction with collaborative learning teams, continues to gain momentum as a popular instructional approach in higher education. In this article, we address three common assumptions about how PBL groups function and report the outcomes of a study in which we examined group dynamics during a computer-assisted PBL module designed to train preservice teachers on the procedures for disciplining students with disabilities. We found that students often do not engage in the constructive dissonance assumed to contribute to strong consensus decisions: groups often defer to an individual or minority opinion with little persuasion or critical thinking. We recommend teaching subject content together with group skills such that future professionals can ensure that all voices are heard, quick answers are scrutinized, and alternative solutions are appropriately vetted by educational teams.*

Problem-based learning (PBL) is a popular instructional approach that continues to gain momentum and is being adopted for professional preparation at colleges and universities around the United States. The goal of PBL is to use multiple perspectives to encourage a learning group to develop alternative solutions to complex problems with the objective of producing better solutions, tapping the cognitive abilities and skills of students through activating prior knowledge, eliciting active participation, and eliminating hierarchies. More specifically, a typical PBL activity is not focused on finding a single correct solution; instead, the intent is to involve all members of a problem-solving team in the discussion and generation of a number of equally viable solutions to one problem. Instructors who use PBL often assume that these goals are reached without explicit construction of the PBL context or training to function within it. However, research in group processes reveals something very different: hierarchies from (Knotek, 2003) opinions of high status individuals override others' opinions (Riecken, 1958), individuals are expected to conform to the group, and the group does not necessarily seek alternative solutions (Ochoa, Gottschall, & Stuart, 2004). In other words, constructive group process skills cannot be assumed to be within the repertoire of a student group (Johnson & Johnson, 1994). Indeed, Knotek's (2003) results on the influence of high-status individuals indicate that these high-stakes skills are not necessarily operating even within professional educational teams.

This study points to the importance of teaching preservice teachers both subject content, and groups skills such that, as professionals, they will be willing and able to guide an educational team past quick an-

swers to thorough consideration of viable solutions (Gerber, English, & Singer, 1999). In this article, we discuss the tensions that exist between the theory and practice of PBL in small groups and describe how PBL groups come to a consensus solution to a learning task. The work extends PBL theory into practice given these dynamics, proposing insights for all instructors, particularly those who teach preservice teachers about special education.

Background and Theoretical Underpinnings of Problem-Based Learning

Problem-based learning is a constructivist approach that intends to develop critical thinking skills through the use of real problems by moving away from passive lecture-based instruction and emphasizing the importance of contextualized learning. While the PBL instructional approach has been used in medical schools for at least three decades (Boud & Feletti, 1997), it seems to have experienced a substantial growth in schools of education at colleges and universities around the United States and abroad. As with other educational innovations, PBL means different things to different people and its application varies considerably. What then are the theoretical underpinnings of PBL and how is it defined and applied in its different incarnations?

Problem-based learning is commonly purported to be the antithesis of traditional lecture-based instruction. Instructors who use the PBL approach in the preparation of future professionals, assert that lecture-based learning is insufficient as a means to develop critical thinking skills in students. According to Gerber et al. (1999), PBL moves instruction away from lectures and emphasizes student-driven inquiry. PBL, as a response to the traditional lecture-based approach to teaching, garnered attention with research conducted in the medical field in the early and mid sixties by Miller and West (in Scheiman, Whittaker, & Dell, 1989). Miller (1962) pointed out that medical students at all levels and class ranking (upper or lower quarter in their respective class) of medical education (2nd, 3rd, and 4th year students) were unable to pass a basic examination upon retake. West (1966) criticized instructors for "being too busy telling students what to learn" and neglected to tell them how to learn. Implicitly and explicitly, both Miller and West argued that instructors must do more than simply ensure that students pass a course examination. PBL, in its most basic definition, emphasizes the process of learning and places less importance on what students learn.

Contextualized learning is perhaps one of the most important underpinnings of PBL (Barron et al., 1998). Proponents of the PBL approach to teaching point to the weaknesses of lecturing to explain students' inability to retain information, much less make use of it: important disciplinary content is taught in a traditional classroom configuration to rows of students passively listening as the instructor lectures. While these students might be able to pass the next test, they soon forget important information. Presumably, then, students are little different in terms of disciplinary knowledge or skills at the end of the course, or program, than when they began. Proponents of PBL argue that teaching students in practical contexts, that is, in environments similar to those that they will one day practice in, should alleviate the weaknesses of the traditional lecture-based instructional approach. PBL simulates those practical contexts with cases that provide students with a concrete, real-life problem to solve. Typically these problems are tackled by a group of peers who serve as resources to each other. Consequently, in PBL learning contexts, the role of the instructor as omniscient expert frequently diminishes.

In its most succinct and less contentious definition, PBL is best understood in terms of how it differs from traditional lecture-based instruction. PBL, unlike lecture, emphasizes active student participation in learning (Savery & Duffy, 1995). Contrary to lectures, PBL uses small group instruction as a configuration to deliver content information. The application of the real-life case and how it is used as an instructional tool varies among PBL practitioners. PBL instructors differ in terms of how much they diverge from the traditional lecture-based format and what they emphasize in their application of

PBL. Some PBL instructors may reduce lecturing from a podium but not do away with lectures altogether. In these instances, a tutor may act on behalf of the instructor to deliver information or facilitate learning of important course content.

PBL Assumptions.

According to PBL scholars (e.g., Albion & Gibson, 2000; Gerber et al., 1999; Savery & Duffy, 1995; Scheiman et al., 1989) the application of the PBL approach to the design of an instructional activity tends to include three major considerations:

- the authenticity and complexity of the learning task,
- feedback on ideas (interventions by the instructor, a tutor, or other means), and
- the relationship between the learner and the learning task, purpose, and process.

The context for learning, the process toward a solution, the role of the instructor, and "ownership" over the problem and solution become central. The scholarly literature has described and examined these components of PBL in the context of group learning. However, this promising research warrants extension, with special diligence to scrutinize how assumptions are carried out in practice. Three assumptions about how PBL functions in learning groups are extrapolated from more contextualized tests of PBL and group-learning models and deserve special attention.

Students learn more in groups than in lecture. PBL practitioners often use peer groups to create authentic environments in which members build knowledge collectively (Savery & Duffy, 1995). These group learning situations are assumed to better prepare students to join the contemporary work world, which increasingly uses a team approach. A cornerstone of this approach is the assumption that learning results from negotiating multiple points of view (Albion & Gibson, 2000). Within a well-designed PBL module, problem-solving undertaken in groups should produce discussion and thus cognitive dissonance that prompt students to reconsider and revise their beliefs, assumptions, and prior knowledge (Albion & Gibson, 2000; Gerber et al., 1999). This interaction of diverse viewpoints becomes the cornerstone of some PBL preservice teacher training modules (e.g., Gerber et al., 1999; Ochoa, 2002; Ochoa et al., 2001; Ochoa, Kelly, Stuart, & Rogers-Adkinson, 2004).

Ideas will be vetted by the group and will prevail on their merits. A key assumption about the use of groups in PBL is that, through "informal democratic discussion" skills that individuals bring with them to the experience, groups will tease out the most meritorious solutions to a problem (DeStephen & Hirokawa, 1988). The consensus opinion that is often the end product of a PBL exercise is assumed to be a satisfied commitment that arises from and incorporates diverse group ideas. However, the literature on group learning shows that students do not automatically exhibit strong student-to-student interaction skills (Johnson & Johnson, 1994). Johnson, Johnson, & Holubec (1994) recommend the jigsaw method as a way to encourage active participation from each member of cooperative learning groups. The jigsaw method promotes interdependence among group members by giving each member of a team a specific role to play or piece of information to contribute to the group. Moreover, social status and personal assertiveness often play a larger role in determining which ideas prevail within a group than the merits of an idea (Riecken, 1958; Knotek, 2003). A recent study by Ochoa et al. (2004) supported the assertions made by Riecken and Knotek about the impact of individuals monopolizing group interactions.

Students' learning is maximized when they learn from tutors, not instructors. In PBL, the activity of the instructor (variously called a tutor, facilitator, or guide) shifts away from lecture and other methods that center on the instructor (Savery & Duffy, 1995). As a consequence, it may seem that the significance of the instructor's content knowledge diminishes and his or her role as expert is decentered or even made irrelevant as students move through the problem-solving process. Gerber et al. (1999) position the instructor as an expert who designs the learning opportunity and the scaffolding that supports learning and then steps back into the role of

guide or consultant (See also, Albion & Gibson, 2000; Schieman et al. 1989). These recommendations assume that individual and group work by students is sufficient for learning or can be best facilitated by a tutor rather than a professor.

These suppositions, however, need further verification in actual professional preparation courses. The first author, in collaboration with others, has embarked upon a systematic study of the implementation of the PBL approach in teacher preparation courses. In this manuscript, we describe a subset of data gathered in a larger study (Ochoa et al., 2004) as a way to begin to understand the PBL group process in general and PBL assumptions about group decision-making process.

Method

Twenty-three undergraduate preservice teacher educators were randomly assigned to groups identified by color (Yellow = 6, Turquoise = 6, Green = 5, Blue = 6) to carry out a two- part simulation of the process public schools must follow when disciplining students with disabilities. The discipline simulation was introduced to participants early in the semester and was the first group activity in a course that met twice per week for 75 minutes each course meeting. The simulation included a combination of individual and group work. In the first part, each individual independently, and outside of the classroom, used a computer-supported module to access content related to a disciplinary case in which a high school student with a disability was found in possession of drugs in school.

Following the PBL design principles described in Gerber et al. (1999), this computer-supported module arranges information in separate units (access points). This organization makes it possible for users to make choices not only about the quantity and type of information they access but also the order and frequency of their access. Logically, the more information students gathered through the access points about the problem, the fuller their understanding about the problem. And conversely, the less information an individual or group has about the problem, the more limited understanding is going to be about the nature of the problem. This simulation requires that students complete the activity once individually (so that each forms individual opinions and solutions) and again in a group (with the intention of both simulating real-world individual education program (IEP) teams and providing different, challenging perspectives and solutions to the same problem). Unlike some other PBL exercises that require students to gather their own information (for instance conducting independent library searches) this module provides students with sufficient, albeit complex and conflicting, information and aims to force students to sift and synthesize information provided within the module.

As part of their individual homework activity, each student responded (independently) to a set of four yes-no questions, adapted from Zurkowski, Kelly, and Griswold (1998) that are the manifestation determination questions required by the Individuals with Disabilities Education Act (IDEA) for disciplining students with disabilities:

1. Were the student's IEP, including the behavior intervention plan (BIP), and placement appropriate with respect to the behavior under consideration? (Provide evidence in support of answer.)
2. Were special education services and supplementary aids and services provided in compliance with IEP and placement?
3. Did the student's disability impair the student's ability to understand the impact and consequences of the behavior? (Provide evidence in support of answer.)
4. Did the student's disability impair the student's ability to control the behavior? (Provide evidence in support of answer.)

According to disciplinary guidelines, if participants answer *yes* to questions 1 and 2, and *no* to questions 3 and 4, the team may determine that the behavior was not a result of the disability. In that case, disciplinary procedures used with students without disabilities may be imposed. If the team answers *no* to questions 1 or 2, or *yes* to questions 3 or 4, then manifestation is shown (Zurkowski et al., 1998) and special education procedures must be used when disciplining the

Table 1. Individual vs. Group Answers on Manifestation Determination Questions

	Does student have a disablilty?			Is IEP appropriate?			Did disability impair abiliity to understant consequences?				Did disability impair ability to control behavior?			
Group	Yes	No	Group	Yes	No	Group	Yes	U	No	Group	Yes	U	No	Group
Y n = 6	6	0	Yes	4	2	No	0	0	6	No	4	0	2	No
T n = 6	6	0	Yes	5	1	No	0	0	6	No	3	0	3	Yes
G n = 5	5	0	Yes	5	0	Yes	3	0	2	No	3	0	2	No
B n = 6	6	0	Yes	5	1	No	0	2	4	Yes	3	2	1	Yes

Note: Y = Yellow, T = Turquoise, G = Green, B = Blue, and U = Unsure.

student. In the second part of the assignment, individuals were assigned to groups that met during the scheduled 75-minute period to discuss the case and provide a group answer to the same manifestation determination questions that were answered individually.

After completing the module's activity by responding to the four manifestation determination questions independently, participants met in their groups to discuss the same questions with members of their simulated IEP team. Two groups met in one room and the other two met in another room. Groups were instructed to press the record button of a camera, which was prearranged for each, before starting the group assignment and the stop button at the conclusion of their discussion. Individual yes-no answers on the four questions were counted and recorded. The groups then discussed the questions until they came to a consensus on each one. Those consensus responses were then recorded. A research assistant analyzed the written responses to determine the extent to which the individual answers agreed with the group-consensus answers. The videotapes were viewed first by a trained research assistant who coded them for themes and then by the first author of this manuscript to see the groups in action during their discussion of the manifestation determination questions. The section that follows provides the individual and group outcomes on the four questions.

Results

As indicated previously, the activity required participants to provide individual and group answers to a set of four questions related to Sebastian, a hypothetical student who was found in possession of marijuana in school. The answers participants provided individually and in their group are presented in Table 1.

The first question that was examined was the existence of a disability at the time of the incident. As expected, all individuals and groups answered yes since the narrative included the student's ("Sebastian's") IEP plan, an indication that the student has a disability and is provided special education services.

In the second question, groups considered the appropriateness of the IEP and the student's placement in special education. Although 19 of the 23 had answered yes in the individual task, 3 of the 4 groups' conclusion was *no*. Only the group which had been unanimous in individual judgments answered *yes* as a group. That is, regardless of what the individual answered, if at least one member of the group answered no, indicating that the IEP or the placement was inappropriate, the group's decision was negative. For example, five members in the Turquoise group (n = 6) indicated a positive response to the appropriateness of Sebastian's placement whereas only one member indicated that his IEP and placement were inappropriate. The transcript of the discussion surrounding that question shows this exchange:

> AL: Yes, I believe IEP and placement was appropriate for his behavior.
> AS: With Sebastian not coming to school on a consistent basis, the IEP does not seem appropriate. How can he academic and socially meet these goals if he is not in school more often? The placement seems to also not be appro-

> priate. Sebastian may need to be in an alternative school (if available) where he can have more one-on-one positive attention and get some help with the drug problem he may or may not have.
> GW: Yes, I believe that Sebastian has a problem or he would not be acting this way. The IEP says that if the student has a disability prior to the bad behavior it would count for them.
> RK: Yes, because they give strict instructions on that he should follow all the rules and what to do if he breaks one.
> EH: Yes, the IEP specifically states that they want to work on Sebastian following school rules and realizing consequences.
> KI: Yes

The consensus emerging from this conversation of individuals in a group is as follows:

> No the IEP is not appropriate, because how can he do most of these things when he is not in school more often? The placement also does not seem to be appropriate, he may need to be in an alternative school where he can receive more one on one attention that he needs.

In other words, while the majority (5 of 6) of the students expressed the individual opinion that the IEP and placement were appropriate, the group, without further discussion, concluded that Sebastian's IEP and placement were *not* appropriate. In short, the minority decision swayed the majority and the group consensus was reflective of the minority opinion.

Similarly, in the blue/gray group the majority found the IEP and placement to be appropriate yet the consensus that the group settled on reflects the unchallenged, dissenting opinion of the minority. The transcript shows this exchange:

> EB: I think that the placement of Sebastian in general classrooms is appropriate. He seems to have no signs of a severe disability holding him back from a normal education. I think that the IEP goals set up for Sebastian are very appropriate and focus on his main areas that need improvement.
> BW: I feel that the IEP is not appropriate. Sebastian needs a lot of attention in order for him to have the appropriate education.
> CM: They are appropriate because they deal a lot with his discipline and how he should be handled.
> PH: I am not sure, I think that the IEP is appropriate, but I am not sure if he is getting the help he needs from his current placement within special education. More might be able to be done to help him.
> JT: I think they are very appropriate. They focus on his attendance, ability to deal with stressful situations, and his need to follow school rules.
> PF: Yes, because his main problem in school is his behavior more than his academic skills.

This interaction shows that 4 of 6 individuals in the group believe the IEP and placement are appropriate, one individual (BW) believes they are inappropriate, and one (PH) is unsure. Similar to the Turquoise group, this group's consensus, as indicated below, about the appropriateness of the IEP and placement reflects the dissenting opinion of just two individuals:

> The IEP has good goals for behavior but is lacking in academic structure. His social skills may improve if he was placed in a different program that focuses more on his needs and disability.

In the third manifestation determination question, groups considered whether the student's disability impaired his ability to understand the impact and consequences of his behavior. In this case, three answers were possible: yes, no, or undecided. As with the responses to the first and second questions, the group answer was consistent with the majority of the individuals only when there was unanimity in the individual decisions. In two groups (Yellow and Turquoise), all individuals answered "no," meaning Sebastian's disability did not affect his ability to understand the impact and consequences of his behavior. As expected, the group consensus was also "no." In the Green group, three individuals indicated that the disability did affect Sebastian's ability to understand the impact and consequences of his behavior, while two individuals believed the disability did not impair understanding. However, one of the par-

ticipants in the majority did not participate in group discussions due to absence, providing an even split in the remaining members when teams met. Thus, this group decision would not reflect a majority or minority view. The fourth group provided an unexpected result. As indicated in Table 1, two individuals in the Blue group were unsure of their opinion on this question while the remaining four individuals answered no. After discussing the question, the group answer was yes; there was cause to believe that Sebastian's disability impaired his ability to understand the consequences of his behavior. This provides an instance in which the consensus did not reflect the initial opinion of any individual in the group, suggesting that, at the individual level, no one held strong convictions about his or her answer.

In the fourth question, groups considered whether or not the disability impaired the student's ability to control his behavior, again answering yes, no, or undecided. As in question 2, the minority opinion swayed the majority decision in two of the four groups (Yellow and Green). Four individuals in the Yellow group indicated that the disability did impair the student's ability to control his behavior while two individuals indicated that it did not:

> MD: Yes, I feel that because of the student's inability to control the situation, the student was frightened to say "no."
> LM: No, the disability itself did not impair Sebastian's control. However, the depression and other side effects of the disability may be causing Sebastian to look for an outlet and crave attention. These symptoms may have inhibited Sebastian's control.
> RH: I do not think the disability impaired the student's ability to control the behavior, but the disability may have impaired the student's ability to control how he acted after the behavior occurred.
> RH: He may have snapped and yelled because he didn't know what else to do when he got into trouble.
> RH: Therefore the disability did not impair the student's ability to control the behavior.
> KS: Yes the disability did impair Sebastian's ability to control his behavior. He needed someone to help him with school and his social struggle because he could not do it on his own because of his disability. Sebastian felt that this was the only way that he would receive acknowledgement.
> LJ: No. I think that Sebastian's disability is irrelevant here.
> JG: I think that he knew that no one is allowed to bring drugs to school. In his interview he seemed intelligent enough to know right from wrong so I am going with no it didn't impair his ability to control the behavior.

It appears from this transcript that "JG" has become the spokesperson for the group, declaring "I am going with no." And indeed, as indicated in the transcript below, the consensus reported by the group matches JG and LM's minority opinion (no) about the student's ability to control his behavior:

> No, Sebastian was not in any way physically impaired to remove himself from the situation. We do feel that he probably felt pressured and scared to say "no" to the drugs, but this pressure is often felt by all students. Sebastian's disability did not impair him in anyway from controlling his behavior.

Similarly, three individuals in the Green group indicated that the disability impaired the student's ability to control behavior and two individuals indicated that it did not: the group, again, went with the minority opinion (no). This pattern did not hold in the other two groups. The Turquoise group made an even split so that three individuals answered yes and three indicated no. As a group, participants responded that the disability did impair the student's ability to control behavior. In the Blue group, three individuals answered yes and one individual was unsure: the group responded affirmatively, confirming the majority opinion.

Observation of the video recording of groups during group interaction shows that the group members do not contribute equally during discussion. Instead, one or two individuals were observed dominating the group interaction while others were observed to be uninvolved in the group process.

Discussion

In PBL, the student learner is assumed to come with a set of personal goals and purposes, establishing his or her own hypotheses, and generally assuming "ownership for the overall problem or task" (Savery & Duffy, 1995). Once in contact with the group, an individual learner is, theoretically, expected to revise, reframe, test, and otherwise negotiate his/her thinking so as to build a consensus with others in the group. Albion and Gibson (2000) refer to this process as stimulating, activating, and elaborating on knowledge. A consensus decision as an "end product of discussion" implies individual *agreement* with and confidence in the decision advocated by the group, an individual's *commitment* to the group and the group decision, and/or *satisfaction* with the group, the group's decision, and the individual's participation in it (DeStephen & Hirokawa, 1988; Zaleznik & Moment, 1964; Klimoski & Karol, 1976; Olaniran, 1996).

Ochoa et al. (2004) suggest that PBL learning groups do not necessarily constructively negotiate diverse individual opinions and points of view to arrive at a collective opinion that prevails on its merits. To the contrary, they suggest that groups may adopt one individual's opinion rather than to construct a new consensus view. For example, in the group decision-making data in Table 1, Group 3 (Green) in question 3 (Did disability impair ability to understand consequences?) had individual opinions split along a 3–2 divide. Although this might seem to be an instance primed for group negotiation toward consensus, in fact there was little discussion before the group decided in favor of the minority opinion. Furthermore, observation of the video recording of this interaction shows that the group members do not contribute equally during discussion. Instead, in this video record, as in several others, one individual emerged as a self-appointed discussion monitor, or gatekeeper, directing the discussion and deciding when to close it and pronounce consensus. While it is possible to conclude that the self-appointed leader felt strongly about the topic, it is apparent that she lacks the skills necessary to elicit productive participation from the other group members, effectively short-circuiting the group problem-solving process.

The data in Table 1 suggest that hierarchies form within groups, even when those groups are assigned randomly by the instructor. These data confirm and expand upon Reicken's (1958) work on group dynamics that studied "the effects of talkativeness on ability to influence group solutions of problems." He found that members who talk the most during group work are credited as contributing most to the solution of the problem and that group members tended to attribute statements that they liked to persons whom the attributor also liked. Riecken found that suggestions and opinions that were offered unsuccessfully were not opposed so much as they were ignored, even when they were offered by "hint-holders" who had additional information that was withheld from the rest of the group. Low-status hint-holders who possessed crucial information for solving the problem appeared to increase the amount of talking they did: six of 15 low-status hint-holders moved up to third place or higher in the interaction hierarchy. However, fewer than 50% were successful in getting the preferred "elegant solution" accepted, and those were most successful when the second-highest ranking person in the group supported their position. In contrast, high-status, highly-talkative contributors failed to have the group adopt their position when they "are unconvinced of its value and do not advocate it strongly."

Similarly, the micro-ethnography of communication in a professional team of educators conducted by Knotek (2003) found that "social power and influence" were reflected in the opinions adopted for a group's consensus: the input of high-status team members strongly influenced the perspectives, lexicon, and decisions of the whole team. Alternative and minority opinions, especially those put forth by low-status group members, received little hearing and had small likelihood of influencing the group's decision: "the problem-solving process. . . became more reflexive and less reflective" (Knotek, 2003).

The data in the current study add the further consideration that, under some circumstances, groups of preservice teachers de-

fer to an individual or minority opinion. If not ruled by the majority, the group consensus was swayed by a convincing high-status individual or a small number of individuals in the group who persuaded the group to adopt their viewpoint. Contrary to such expectations, and inconsistent with Knotek (2003), Reicken (1958), and Katsiyanis and Maag (2001), the results from this study on group work indicate that under some circumstances groups of preservice teachers defer to an individual or a minority opinion with little persuasion. While the facilitators in this study do not necessarily talk more than other group members, the data suggest that they do occupy a marked position even within a group of peers. They function as gatekeepers and process monitors, deciding which ideas are worth attending to in a discussion and when consensus has been reached.

Upon analysis of the group work, one unexpected result was evident: even when agreement existed among the majority in a group, the minority opinion could still prevail. The peculiarity in this result is that the individual who swayed the majority was not necessarily a particularly strong personality. In this study, it appears that the majority was swayed by any demonstration of dissent. Further study could reveal whether this occurred because the problem-solving situation was a simulation and a course assignment, thus individuals may not have defended their ideas to the extent they would if they were working with a real student. Nonetheless, these results are informative and may not be unlike what takes place in actual IEP teams.

In short, the data in this study indicate that group members are less than able to distinguish between the quality and quantity of contributions or between the idea and its advocate. These results imply that higher education needs to prepare high contributors to generate solutions they can propose, defend, and uphold. Equally important, instructors in higher education need to prepare low-quantity contributors and those in low-status jobs with the skills to advocate for their ideas and to garner them further support. It is essential that those preservice professionals preparing for leadership roles develop skills for eliciting and evaluating opinions based on their worth (Lashaway, 2002).

Furthermore, the instructor remains a critical leader in student learning, not least of his/her tasks to ensure appropriate training of group process. Indeed, without special instruction student tutors charged with facilitating group problem solving will only serve to reify the instructor-student (high-status-low-status) hierarchy.

Finally, the data in this study argue for the instructor functioning in a role distinct from (not equal to) team members. In hybrid models of PBL such as this one, the instructor's role requires expert knowledge or in-depth experience, provides scaffolding, and issues guidance that facilitates students' learning (Savory & Duffy, 1995). In addition to content expertise, instructors need to help launch students in what may be the unfamiliar PBL environment and provide training in group process and advocacy. While PBL aims to launch students into a realistic problem-solving environment, their position as novices requires that the instructor continue to be an active player well into the learning experience.

Conclusion

If competence in both process and content are needed to function effectively within a discipline (Scheiman et al., 1989), then problem-based learning must adequately address both. "Pure" PBL purports to remedy the content-heavy focus of the lecture method by focusing on process. Yet organizing students into teams around a problem does not automatically produce good process. Inadequate reasoning, negotiation, and reflection that easily capitulate to an untested opinion remain problematic. Moreover, left unsupervised, student groups are likely to reproduce the limitations that are typically associated with lecture-based formats. Thus instructors using PBL need to foster and assess dissonance so that it remains an integral component of group learning. Because general and special education teachers may occupy low-status positions in IEP and other K-12 decision-making teams, they must have the skills to be high-contributors with the knowledge and advocacy skills that will elicit

a fair hearing for their ideas. Indeed, reliance on a flawed process to convey the specialized knowledge that is the purview of higher education, much of it painstakingly established, leaves our future teachers and their most vulnerable students at substantial risk. Perhaps a hybrid PBL model with sufficient scaffolding and training can teach both effective process and sound content, fostering a true "cognitive apprenticeship" in the preservice years (Albion & Gibson, 2000). Such a model might include strategies such as the jigsaw approach used by Johnson, Johnson, and Holubec (1994) to promote group interdependence.

Assuring that problem-based learning is applied appropriately to teacher preparation requires not only a set of guidelines on group process and organization of content but a set of research, development, and evaluation strategies which can be used by individual faculty as well as by academic departments and professional organizations to address the unique learning and professional needs of their students. More specifically, this study suggests that future investigations should focus on ways to train education professionals to garner their views a fair hearing, including the extent to which typical preservice teachers are ready developmentally to challenge each other's ideas and reason effectively to a consensus conclusion. Such a study might include an assessment instrument (or plan) to administer to individuals after they participate in group work in order to assess *individual* learning. Data analysis could consider the assessment of learning by low-contributors. In other words, such a study would contribute to understanding the importance (in education and in future employment success) of having some members contribute more than others. The impact of such a study could be broadened by involving a second-tier group of higher education instructors who would assess group participation and consensus-building in diverse subjects in the arts and sciences.

Appendix: Manifestation Determination Questions

1. At the time of the incident, did the student have a disability?
2. In relation to the behavior, are the IEP and placement appropriate?
3. Did the disability impair the student's ability to understand the impact and consequences of his misbehavior?
4. Did the disability impair the student's ability to control the behavior?

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