

## ***COLLABORATIVE LEARNING***

### **Executive Summary**

Qualitative findings showed stronger outcomes than the course outcomes; however, the database was quite small and a number of intervening variables need to be explored. This intervention shows enough potential that it is being explored for inclusion in MECC's Quality Enhancement Plan for SACS reaccreditation and the Gates Foundation proposal.

### **Development and Implementation**

#### **Training:**

- **Spring 2006:** Five MECC faculty members participated in a week-long training workshop (over 30 hours) in Cooperative Learning sponsored by Patrick Henry Community College and conducted by faculty from the University of Minnesota's Cooperative Learning Center.
- **Spring 2007:** Three MECC faculty members participated in a week-long training workshop in Cooperative Learning sponsored by Patrick Henry Community College and conducted by faculty from the University of Minnesota's Cooperative Learning Center. Two were faculty who participated in the previous year's training and returned for more training at an advanced level.
- **Spring 2007:** Eleven MECC faculty members participated in a series of on-campus workshops on Cooperative Learning sponsored by the AtD Learning Communities and Active Learning Committee. Six faculty members completed the 8 hours of training.
- **Other:** Other faculty in the collaborative learning initiatives had received training through other conference workshops prior to AtD. The college also ordered print resources that were placed on reserve in the college library.

#### **Coordination:**

Faculty training and implementation of collaborative learning initiatives were coordinated by the chair of the AtD Learning Communities and Active Learning committee.

#### **Development:**

Although faculty teaching in programs across the campus received training in collaborative learning through AtD, we focused our initiatives related to the use of collaborative learning in the classroom on developmental reading, writing, and math.

Three developmental writing instructors, one developmental reading instructor, and two developmental math instructors made revisions to their courses to employ active/collaborative learning activities in the classroom.

Activities varied according to the instructor and the discipline as well as the individual's approach to using active/collaborative learning in the classroom. Three of the four English instructors had received 30 hours of formal training in Cooperative Learning, and one math

teacher had received 8 hours of formal training in Cooperative Learning. Of the other two instructors one had no formal training in the use of collaborative learning, and the other had some conference workshop training in a type of collaborative learning other than Cooperative Learning.

### **Implementation:**

**Fall 2007:** The six faculty members mentioned above piloted active/collaborative learning activities in four sections of ENG 3 (developmental writing), three sections of ENG 5 (developmental reading), two sections of MTH 3 (Algebra I) and one section of MTH 4 (Algebra II).

**Spring and Fall 2008:** Five of the instructors involved in the pilot semester have continued to use collaborative learning in their English and math developmental classes. Because of changes in course assignments, one English instructor did not teach on-campus developmental writing classes during these semesters. However, one additional instructor has begun using collaborative learning in developmental writing. Collaborative learning is also being used in some sections of college-level writing courses.

### **Findings**

**Student Engagement with Learning:** The results of Likert scale surveys administered in the pilot classes during the Fall 2007 and Fall 2008 semesters were very positive. The vast majority of student respondents indicated that they enjoyed group activities in the classroom, and the most frequent responses were that collaborative learning activities helped them to get to know their classmates and better understand the course material. The majority of the respondents both semesters also felt that collaborative learning is more effective than lecture.

**Effect on Student Success:** Comparative studies were made of student success rates in the sections of developmental English and math classes that used collaborative learning activities and the sections of those courses that did not. The data indicates that improvements in student success were noted in some classes, but the data was too small for some classes or the difference was not statistically significant for any conclusive findings to be reached.

**Faculty Training and Experience:** The results of student surveys also indicated a positive correlation between faculty training in/experience with collaborative learning and student engagement. Classes taught by faculty with the most formal training in collaborative learning and/or the most experience had a higher percentage of positive responses from students. This data seems to support several of the principles taught through the University of Minnesota's Cooperative Learning Center:

- Faculty must practice the use of collaborative learning in the classroom.
- Results improve over time as the instructor becomes more comfortable with and experienced in the use of this teaching/learning method.
- Attempting to use collaborative learning in the classroom without formal training in its use often produces negative results.

**Table Describing Student Outcomes**

**Developmental Math 3 – Algebra I  
Experimental Teaching Methods - Fall, 2007**

**Table 1. Student outcomes for Math 3 Day Sections, Fall 2004 – 2007**

<b>Fall Term</b>	<b>Number of Students</b>	<b>Pass Rate (S grades)</b>	<b>Withdrawals (W grades)</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
2004	129	36%	24%	2.31	53%
2005	115	37%	19%	2.25	54%
2006	127	41%	19%	2.06	50%
2007	115	46%	8%	2.05	56%

**Table 2. The use of new teaching methods in three, day sections of Math 3**

<b>Sections</b>	<b>Collaborative</b>	<b>PLTL</b>	<b>Manipulatives</b>	<b>Navigator</b>
1		X		X
3	X	X	X	
4	X		X	
2	NA	NA	NA	NA
5	NA	NA	NA	NA
Evening	NA	NA	NA	NA
Web	NA	NA	NA	NA

**Table 3. Student outcomes for Math 3 sections, Fall 2007**

<b>Sections</b>	<b>Number of Students</b>	<b>Pass Rate (S grades)</b>	<b>Withdrawals (W grades)</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
1*	22	41%	0%	1.73	52%
3*	23	43%	17%	1.89	54%
4*	21	33%	10%	2.10	57%
2	23	70%	4%	1.78	60%
5	26	42%	8%	2.73	58%
Evening	20	55%	25%	2.16	54%
Web	29	17%	17%	2.19	37%

\*Sections using new teaching methods

**Developmental Math 4 – Algebra II**  
**Collaborative Learning Experimental Teaching Method Fall, 2007**

**Table 1. Student outcomes for Math 4 Day Sections, Fall 2004 – 2007**

<b>Fall Term</b>	<b>Number of Students</b>	<b>Pass Rate (S grades)</b>	<b>Withdrawals (W grades)</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
2004	59	32%	19%	2.21	47%
2005	61	28%	8%	2.13	52%
2006	67	43%	12%	2.47	63%
2007	50	42%	10%	2.24	57%

**Table 2. Student outcomes for Math 4 sections, Fall 2007**

<b>Sections</b>	<b>Number of Students</b>	<b>Pass Rate (S grades)</b>	<b>Withdrawals (W grades)</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
1*	26	35%	12%	2.17	58%
2	24	50%	8%	2.32	57%
Web	26	31%	19%	2.23	48%

\*Section using collaborative learning

**Collaborative Learning**  
**Developmental Math 3 and Math 4, Algebra I & II Fall, 2007 (36 Responses)**

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. I have enjoyed the use of learning groups in this class.	33%	53%	3%	11%	
1. Learning groups have helped me to better get to know my classmates.	44%	44%	8%	3%	
2. Learning groups have helped me to better understand the course material.	31%	50%	11%	6%	3%
3. Activity sheets have helped me to better understand the course content.	6%	56%	28%	11%	
4. I feel that group learning activities are a waste of time.		3%	8%	50%	39%
5. I feel that group learning is a more effective way to learn than listening to lectures.	22%	33%	39%	3%	3%

### Collaborative ENG 3, Day Sections

**Table 1. Student Outcomes for ENG 3, Day Sections, Fall 2004 – 2007**

<b>Fall Term</b>	<b>Number of Students</b>	<b>Pass Rate (S grades)</b>	<b>Withdrawals (W grades)</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
2004	118	57%	21%	2.35	61%
2005	106	55%	25%	2.25	59%
2006	109	51%	22%	2.39	56%
2007	103	58%	20%	2.14	55%

**Table 2. Student Outcomes for All ENG 3, Day Sections, Fall 2007**

<b>Sections</b>	<b>Number of Students</b>	<b>Pass Rate (S grades)</b>	<b>Withdrawal Rate</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
2*	19	79%	16%	2.20	65%
3*	21	57%	24%	1.85	54%
4*	18	39%	28%	2.8	57%
5*	17	71%	24%	1.64	50%
1	12	58%	25%	1.95	45%
6	16	44%	0%	2.45	54%
Night	20	65%	30%	2.19	50%
Web	22	59%	14%	2.28	63%

**Table 3. Student Outcomes for Collaborative & Non-Collaborative ENG 3, Fall 2007**

<b>Sections</b>	<b># of Students</b>	<b>Pass Rate (S grades)</b>	<b>Withdrawal Rate</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
<b>Collaborative</b>	<b>75</b>	<b>61%</b>	<b>23%</b>	<b>1.99</b>	<b>57%</b>
<b>Non-Collaborative</b>	<b>28</b>	<b>50%</b>	<b>14%</b>	<b>2.24</b>	<b>50%</b>

**Student Survey Results for Collaborative ENG 3, Fall 2007**

<b>Statements</b>	<b>Strongly Disagree</b>	<b>Agree</b>	<b>Undecided</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>I have enjoyed the use of learning groups in this class.</b>	<b>47%</b>	<b>45%</b>	<b>5%</b>	<b>3%</b>	
<b>Learning groups have helped me to better get to know my classmates.</b>	<b>61%</b>	<b>34%</b>		<b>5%</b>	
<b>Learning groups have helped me to better understand the course material.</b>	<b>39%</b>	<b>45%</b>	<b>8%</b>	<b>8%</b>	
<b>I am comfortable with another student helping me with my essays.</b>	<b>45%</b>	<b>42%</b>	<b>8%</b>	<b>5%</b>	
<b>I like being able to help another student on his/her essays.</b>	<b>33%</b>	<b>54%</b>	<b>8%</b>		
<b>I feel that group learning activities are a waste of time.</b>	<b>3%</b>	<b>5%</b>	<b>13%</b>	<b>37%</b>	<b>42%</b>
<b>I feel that group learning is a more effective way to learn than listening to lectures.</b>	<b>34%</b>	<b>45%</b>	<b>13%</b>	<b>5%</b>	<b>3%</b>

### Collaborative ENG 5, Day Sections

**Table 1. Student Outcomes for ENG 5, Day Sections, Fall 2004 – 2007**

<b>Fall Term</b>	<b>Number of Students</b>	<b>Pass Rate (S grades)</b>	<b>Withdrawals (W grades)</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
2004	59	68%	12%	2.58	63%
2005	65	69%	9%	2.35	60%
2006	53	53%	15%	2.27	52%
2007*	59	63%	8%	1.79	52%

\*All three sections used collaborative learning.

**Table 2. Student Survey - Collaborative Learning, ENG 5- Reading, Fall 2007 (33 Responses)**

<b>Statements</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Undecided</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
1. I have enjoyed the use of learning groups in this class.	39%	49%	9%	3%	
2. Learning groups have helped me to better get to know my classmates.	42%	52%	6%		
3. Learning groups have helped me to better understand the course material.	39%	42%	12%	6%	
4. Group learning activities have helped me to better prepare for tests.	33%	46%	15%	6%	
5. Group learning activities have helped me to better understand the course content.	42%	46%	9%	3%	
6. Group activities have helped me express my understanding of the course materials.	36%	42%	18%	3%	
7. Group activities have helped me prepare for the final tests on Rocket Boys.	30%	46%	18%	6%	
8. I have enjoyed sharing my opinions in learning groups.	27%	49%	15%	9%	
9. I feel that group learning activities are a waste of time.	3%		9%	55%	33%
10. I feel that group learning is a more effective way to learn than listening to lectures.	55%	21%	12%	12%	

## Start-Up and Continuing Cost for the Intervention

### *Start-up Costs*

Description of Expense	Unit Cost (exact or range)	Total Units	Cost
Training fees and travel for training at PHCC		6 unduplicated faculty members took advantage of training at PHCC; others were trained at MECC	\$5,536
(Costs for releasing faculty identified with revised course costs)			
<b>Total Cost</b>			<b>\$5,536</b>

### What we learned while implementing this intervention

**Informal vs. Formal Collaborative Group Activities:** **Informal collaborative groups** are ad hoc groups formed for a short period of time, a few minutes to one class meeting, and are focused on a specific and small learning objective. **Formal collaborative groups** are formed to last for longer periods of time, several class meetings, several weeks, or even the whole semester and are designed to address larger learning objectives or even as student support groups, the principle of base groups used in Cooperative Learning, a type of collaborative learning developed by Johnson and Johnson at the University of Minnesota. Studies have shown that the use of **formal collaborative learning** groups can have a positive impact on student retention. Ironically, in some sections of classes, instructors had difficulty forming long-term formal collaborative groups because of sporadic class attendance by many students and had to rely solely on the use of ad hoc informal groups. The problem seemed to occur consistently with developmental writing classes taught at 8:00 AM.

**Class Time Constraints:** One common complaint from both students and faculty related to using collaborative learning in the classroom is that is time consuming. In addition to teaching course content, faculty who use collaborative learning must teach students how to work effectively in groups. Moreover, until students (as well as instructors) become practiced in using the strategy, collaborative learning requires considerably more class time than lecture. As a result, faculty tend to drop use of the strategy when its use is seen to compromise meeting primary learning objectives in the course, especially when class time is lost for additional reasons such as snow days or instructor absences for other reasons.

For these reasons, faculty new to using collaborative learning in the classroom should implement the strategy gradually, trying and perfecting one or two types of activities before implementing more comprehensive use of the strategy. Moreover, the student learning curve can be reduced

when more faculty at an institution use collaborative learning and when other educational institutions employ the strategy. Once students learn how to work effectively in groups, it is a skill that they can carry over readily to other classes, to other schools, and to their careers.

### **Faculty, Administration and Student Conclusions Regarding Outcomes and Faculty and Administration Conclusions Sustainability**

#### **Conclusions by the AtD Learning Communities and Active Learning Coordinator:**

**Student Engagement with Collaborative Learning:** Positive responses from students and from faculty involved with the initiative suggest that we should continue to use collaborative learning activities in developmental English and math classes as well as in other classes on campus. The college should consider encouraging other faculty to adopt this teaching/learning method.

**Faculty Training:** Since the results of student surveys indicated a positive correlation between faculty training in/experience with collaborative learning and student engagement, the college should continue to support formal training for faculty in the use of collaborative learning and should encourage faculty to receive this training.

**College and Faculty “Buy in”:** One of our sister AtD colleges, Patrick Henry Community College, made Cooperative Learning a major focus of their AtD initiatives and required all full-time faculty to receive core training in the use of this method. Apparently they have enjoyed significant success with this approach. One negative result of mandated faculty training in and use of a particular teaching/learning method is faculty resistance. MECC faculty who attended the spring 2006 Cooperative Learning Institute at PHCC reported that some PHCC faculty who were reluctant to receive this mandated training had a negative impact on the morale and effectiveness of the learning groups they were assigned to. This is to be expected. Without coaching and interventions from the instructor, students who do not “buy into” the method can have a negative effect on cooperative learning groups in the classroom as well. However, PHCC’s experience seems to suggest that with appropriate coaching and general college-wide support, such initial resistance can be overcome. That is true in the classroom as well.

**Increasing the Effectiveness of Collaborative Learning:** Another advantage of college-wide “buy in” is suggested above in what we learned about the time constraints of using collaborative learning in the classroom. When more faculty use collaborative learning, less time is spent by any one instructor helping students learn how to work effectively in groups.

**Sustainability:** Collaborative learning is a low cost and relatively easy initiative to sustain. Other than the initial cost of faculty training, there are few budget and personnel implications related to this initiative. If the college wishes to promote the use of this strategy and continue to study the results it has on student success and retention, some coordination of training and institutional research will be necessary. However, any coordination of the use of collaborative learning can be done at the department or program level without the need of additional staff or a designated activities coordinator from the current staff.