

**Establishing Groups in the College or University
Classroom: Using *VIEW* to Form Better Cooperative
Groups and Improve Learning Outcomes**

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Abstract

*Six classes at a selective liberal arts college in the Midwest, two each in chemistry, educational studies, and Spanish, used cooperative groups as part of the students' learning experiences. One class from each discipline used *VIEW* to formulate these cooperative groups, while those that constituted the control groups used more traditional ways of creating groups. At the end of each class, all students were given a survey asking them to evaluate various aspects of their experiences with group activities. Those students whose groups had been formed using data from *VIEW* reported statistically significant differences in their satisfaction with their group experiences, especially with regard to attention the group gave to new ideas, preferences for the level of structured authority, how information was handled by the group, and the balance between task concerns and personal or interpersonal needs when making decisions.*

Introduction

As the pressure to demonstrate learning in college and university classrooms increases, many faculty are attempting to use more group assignments in their classes. The value of cooperative grouping is high, with a variety of studies suggesting that this is one of the more reliable ways to boost student achievement in the classroom (see e.g., Johnson & Johnson, 1990; Sharan & Shaulov, 1990; Slavin, 1990). Many

college and university instructors, however, are less than comfortable using cooperative grouping strategies (Sharan, 1990; 1994). Those uncertain about cooperative grouping have often dealt with student complaints about the process and have questions about how best to proceed. How should students be grouped so that the experience is as valuable as possible for all? Does the composition of a group affect the students' perception of how well the group functions? Is there a way I can consider student learning style preferences when forming groups? Which student problem-solving preferences most greatly affect group performance?

Happily, instructors seeking to improve student experiences with cooperative grouping can use *VIEW: An Assessment of Problem Solving Style* as a tool to assist them in group construction (Selby, Treffinger, & Isakesen, 2002; 2007). As an individual's creative problem solving style represents a relatively stable preference that he or she articulates when approaching problems, considering information, and making decisions, placing him or her in a group setting that recognizes these preferences can affect that experience in positive ways (Houtz & Selby, 2009; Selby, Treffinger, Isaksen, & Lauer, 2004). This study examines how faculty at a highly-selective liberal arts college used *VIEW* to form cooperative groups in chemistry, education, and Spanish classes, where one class in each discipline used *VIEW* to group students and the other did not. Specifically, using *VIEW* to group students according to their problem solving style preferences resulted in statistically significant differences between the treatment and control groups regarding perceptions of how the groups handled information, considered both individual and group needs, and provided a good fit in which the student could work most effectively. These results suggest that using *VIEW* might assist instructors in forming groups that work more smoothly and

accomplish more than those formed using conventional approaches.

Problem Solving Styles and Groups

Style theory is predicated upon the assumption that problem solvers prefer to approach a problem, or to work on it, in specific ways that are often different from the tactics and methods used by others (Alacapinar, 2013; Sternberg, 1997). *Style* represents an individual's preference for the approach that is taken when attacking problems, thinking about information, and making decisions (Houtz & Selby, 2009; McCoy, Selby, & Houtz, 2014; Sternberg & Grigorenko, 1997). Allowing individuals to use their preferred problem solving styles, either when working individually or as part of a group, reduces the number of difficulties and increases the chance of a successful solution to the problem at hand (Batchelor & Buntz, 2013; Houtz & Selby, 2009; Schroth, 2007; Selby et al., 2004). When engaged in cooperative learning situations, such differences in problem solving styles can become more significant, as different preferences may reduce or limit a group's ability to work together effectively (Breneiser, Monetti, & Adams, 2012; Selby et al., 2002; 2007; Slavin, 1990). Specifically, how a group attends to its members' needs to interact with others, go about solving problems, processing information, dividing tasks, and balancing needs to complete the tasks with personal and interpersonal concerns can greatly affect an individual's experiences with that group.

As the use of cooperative groups becomes more prevalent and popular in college and university classrooms, effective ways of forming those groups is increasingly important to course instructors, students, and administrators (Baer, 2003; Kyprianidou, Demetriadis, Tsiatsos, & Pombortsis, 2012). Indeed, there is a growing understanding that effectively formatted groups boost student achievement

(Breneiser, Monetti, & Adams, 2012; Brophy, 2006; Schroth & Helfer, 2008). Effective teachers know how to group students so that cooperative group experiences are productive and beneficial (Strong, 2011; Stronge, 2007). Despite the body of literature supporting cooperative grouping, many students, and even some of their instructors, resist this instructional method in their classes (Baer, 2003; Marks & O'Connor, 2013). Few teachers or instructors understand, or are comfortable with cooperative grouping (Darling-Hammond, 2010; Darling-Hammond & Bransford, 2005; McCoy, Selby, & Houtz, 2014; Missett, Brunner, Callahan, Moon, & Azano, 2014). This is especially true for instructors at the college and university level, many of whom have little if any formal training on how to teach (Loughran, 2005; Peterson & Miller, 2004). Such instructors need a way to quickly and inexpensively determine a way to group their students in a way that will produce groups that are productive, effective, and acceptable to students (Darling-Hammond, 2010; Lucas, 2010; Treffinger, 2005; Treffinger & Ripple, 1970, 1971; Treffinger, Solomon, & Woythal, 2012). *VIEW* represents one way to arrange such groups within a class, permitting the instructor insights into how his or her students prefer to solve problems and work with others.

VIEW examines three preferences that individuals have when determining how to perceive and approach problems, to generate ideas that may result in solutions, and to evaluate and choose among possible resolutions (Selby et al., 2007; Selby et al., 2004). The three preferences that *VIEW* examines are orientation to change, manner of processing, and ways of deciding (Selby et al., 2007; Selby et al., 2004). *Orientation to change* examines how comfortable an individual feels when working within a structure to solve a problem, especially with regard to preferences for responding to and managing authority, novelty, and structure when faced with solving problems (Selby et al., 2004; McCoy, Selby, &

Houtz, 2014; Shaw, Selby, & Houtz, 2009). While some work best within the existing structure, others prefer to create entirely new arrangements and rules to deal with the problem at hand. *Manner of processing* scrutinizes the way in which individuals prefer to grapple with a problem, especially with regard to how they manage inner energy and resources, how they manage information, and how and when they share their thoughts and ideas with others (Selby et al., 2007). Some have a strong preference to rely upon their internal resources when considering ideas, while others elect to seek external views and insights from others. *Ways of deciding* denotes those considerations that are deliberated upon when choosing among possible solutions. Some individuals are more person-oriented and consider how a given solution will affect others, while others are more task-oriented and will seek solutions that get the job at hand completed.

Methodology

Participants

Using course offerings at a highly-selective national liberal arts college in the Midwest, the chemistry, educational studies, and Spanish departments were identified as having two sections of the same course offered in which enrolled students engaged in assignments that included cooperative groups. The educational studies classes enrolled students with junior standing, while the chemistry and Spanish classes enrolled students at the introductory level. Of the 102 students, 29 were first years, 18 were sophomores, 39 were juniors, and 16 seniors. All of these were traditional-aged undergraduates, ranging from 18 to 22 years old. Of these, 9 were African American (8.8%), 5 were Asian (4.9%), 71 were Caucasian (69.6%), and 16 were Hispanic (15.7%). Of the students, 61 were female (59.8%) and 41 were male (40.2%).

Instrument

VIEW is a 34-item self-reported Likert-scale instrument that measures three largely independent constructs (Selby, Treffinger, & Isaksen, 2002; 2007). Individuals taking *VIEW* indicate their preference along a bi-polar scale for items related to orientation to change (OC), manner of processing (MP), and ways of deciding (WD) (Selby, Treffinger, Isaksen, & Lauer, 2002; Selby, Treffinger, & Isaksen, 2002; 2007). The poles for OC are *explorer* and *developer*, for MP these are *external* and *internal*, and for WD these are *person-oriented* and *task-oriented*. While some individuals exhibit no preference for a category, although most do (Shaw, Selby, & Houtz, 2009; Selby, Treffinger, & Isaksen, 2002; 2007).

VIEW has been used for over a decade, permitting a body of evidence to exist that helps to assess its reliability and validity (Selby, Treffinger, & Isaksen, 2002; 2007). With regard to reliability, *VIEW* demonstrates stability correlations from a test-retest reliability study where the 12-month test-retest reliability coefficients were: orientation to change, $r = .74$; manner of processing, $r = .83$, and ways of deciding, $r = .81$ (Treffinger, Isaksen, & Selby, 2014). When the master database of over 45,000 *VIEW* scores were examined, they produced Cronbach's coefficient Alpha results of .87 for OC, .86 for MP, and .84 for WD, exceeding the generally accepted criterion that internal consistency should be $>.70$ (Treffinger, Isaksen, & Selby, 2014). A variety of studies also attest to the validity of *VIEW* (Houtz, 2002; Selby, Shaw, & Houtz, 2003; 2005).

One class of students in each discipline took *VIEW* and one did not. The results of *VIEW* were used by the instructor for each class receiving the treatment to group the students in cooperative groups of four (two groups contained three students because of numbers). At the conclusion of each class, all students were given a survey, regardless of whether they took *VIEW* or not. The research design chosen

for this survey includes descriptive statistics to assess attitudes, opinions, and preferences regarding working in a cooperative group and inferential statistics to explore the descriptive results (Brown, Renzulli, Gubbins, Siegle, Zhang, & Chen, 2005; Fisher, 1971; Gay & Airasian, 2003; Pedhazur & Schmelkin, 1991). The survey items were constructed using a three-step process. First, an extensive literature review validated conceptions of orientation to change, manner of processing, and ways of deciding (Isaksen, Dorval, Noller, & Firestien, 1993; Jeon, Moon, & French, 2011; Selby, Shaw, & Houtz, 2003; Sternberg & Grigorenko, 1997). Next, a panel of experts regarding problem solving styles and cooperative grouping, including researchers, university faculty, and assessment authors, reviewed the survey for construct validity. Finally, survey reliability was ascertained to be at a .96 level using the Spearman-Brown split-half approach to compare the survey to one with twice as many items (Cohen & Swerdlik, 2005). The survey had a high level of internal consistency among the subsets of the survey items, as determined by Cronbach's alphas of 0.91, 0.93, and 0.90 for those items related to OC, MP, and WD respectively (Cohen, 1988).

Procedures

Each of the treatment classes was administered *VIEW* by the lead author, an experienced researcher who is trained in test administration, scoring, and interpretation and who is *VIEW*-certified. *VIEW* certification indicates that the *VIEW* user has been trained in the application, feedback, and administration of *VIEW*. *VIEW* took approximately 15 minutes for students in each class to complete. The administration was conducted during regular class time, and participants understood that the results were not to be used for their course grades, but instead by the instructors for grouping purposes. These *VIEW* results were then hand-

scored by the lead author, who also provided feedback to participants regarding their individual and group scores and regarding creative problem solving styles and preferences. The instructors of each course then used *VIEW* data to form groups for cooperative projects within each class in the treatment group. The instructors considered OC scores as the primary means for forming groups, with WD scores used as a secondary means of consideration. OC scores can theoretically range from 18 to 126, with a theoretical mean of 72 (Selby, Treffinger, & Isaksen, 2007). In forming the groups for the treatment classes, instructors grouped together those with similar scores, with mean group scores ranging from 48 to 109. The range of OC scores within groups did not vary by more than 12. WD scores, which can theoretically range from 8 to 56 with a theoretical mean of 32, were also considered after the initial formulation of groups. In two cases using the OC scores alone would have resulted in groups where the WD range of members would have exceeded 25 points. In those cases, adjustments were made that reduced that range while still maintaining a range of OC scores that was less than 12. For the control group classes, which did not use *VIEW*, traditional grouping methods were used, such as counting off or using the alphabet.

At the conclusion of the class, students from both the treatment and control groups were given a survey. This survey asked the students to reflect upon and rate their experiences working within their cooperative groups and took about ten minutes to complete. After each of the anonymous surveys was numbered, results from the survey were entered into *IBM SPSS Statistics*, a software package formerly known as *Statistical Package for the Social Sciences*. For each of the variables, descriptive statistics were calculated, with the results transferred into tables. The study was predicated upon a null hypothesis that there would be no difference in student perceptions of group experiences as reflected by the survey

between the control and treatment groups. As a result, a series of ordinal regression analyses next were used as a predictor of student satisfaction with group experiences. Ordinal regression is a statistical technique used to predict an ordinal dependent variables given one or more independent variables. Ordinal regression was chosen as most appropriate form of analysis to be used with variables that are measured on an ordinal scale, such as the Likert-items used on the questionnaire used in the study. Ordinal regression is the more conservative approach, but it explicitly recognizes the ordinal nature of the survey items, frees us from having to make arbitrary assumptions about the scale of the ordinal variables, *and* permits the use of structural equation modeling at some later date (Winship & Mare, 1984). The SPSS ordinal regression procedure, or Polytomous Universal Universal Model (PLUM), an extension of the general linear model to ordinal categorical data, was used for these calculations. SPSS was also used to confirm that the four assumptions necessary for ordinal regression (i.e., ordinal measurement of dependent variables; independent variables that are continuous, ordinal, or categorical; no multicollinearity; and proportional odds) and to generate parameter estimates. To counteract the issue of multiple comparisons, Bonferroni corrections were used to control the familywise error rate. To maintain the desired $p < .05$, the Bonferroni correction set α/n . As there were 21 items in the survey, this resulted in $p < .002$.

Results and Discussion

The study's first research question sought to determine the perceptions of students who have undertaken classes that utilize group work have regarding their group work experiences. In particular, the study was interested in how well students felt their group experiences fit their particular skills and needs, both cumulatively and depending whether or not an individual's group was formed using VIEW. As

Table 1 *Student Perceptions of Cooperative Group Experiences (n=102)*

	Percentage of students responding			
	SA	A	D	SD
The amount of attention my group gave to ideas or options that were novel worked well for me and felt comfortable.	25.5	61.8	5.9	0
The extent to which my group asked its members to respond or react to novel or unusual ideas was a good “fit” for my natural preference.	17.6	64.7	8.8	0
The extent to which my group expected me to come up with or contribute novel ideas was comfortable and fit me well.	26.5	61.8	7.8	0
The amount of attention my group gave to managing the structure of the tasks we tackled worked well for me and felt comfortable.	23.5	55.9	13.7	2.0

The extent to which my group asked its members to create and conform to structure in dealing with tasks was a good “fit” for my natural preference.	19.6	56.9	12.7	1.0
The extent to which my group allowed me to come up with or contribute to the structure to our tasks was comfortable and fit me well.	35.3	54.9	5.9	1.0
The amount of attention my group concentrated on and structured authority caused it to be near enough so that it was helpful.	20.6	52.9	8.8	3.9
The amount of attention my group concentrated on and structured authority caused it to be so near that it was suffocating.	1.0	6.9	39.2	40.2
I was able to use my own inner energy as a consequence of working with members of my group.	13.7	46.1	7.8	2.0

Working in a group built up and increased my energy for the tasks on which we worked.	26.5	36.3	23.5	7.8
Working in a group drained my energy for the tasks on which we worked.	9.8	18.6	38.2	23.5
Working with my group assisted in providing me with a learning environment that helped me better understand the tasks at hand.	37.3	44.1	9.8	2.0
The extent to which my group allowed me to contribute to our learning environment was comfortable and fit me well.	29.4	54.9	10.8	1.0
Working with my group allowed me to handle information in a way that was natural for me.	21.6	54.9	14.7	3.9
My group allowed me to come up with or contribute to the different ways we handled information so that it was comfortable and fit me well.	26.5	56.9	6.9	1.0

I used different ways of handling information when solving problems in ways that were natural for me.	20.6	59.8	5.9	2.0
My group allowed me to come up with or contribute to the different ways we handled information when solving problems.	24.5	65.7	3.9	0
My group balanced task concerns and personal or interpersonal needs of group.	18.6	56.9	14.7	2.9
I was able to come up with or contribute to ways of balancing task concerns and personal or interpersonal needs of group members.	20.6	54.9	7.8	0
My group balanced task concerns and personal or interpersonal needs when considering the most important aspects of a problem.	18.6	54.9	10.8	1.0
My group balanced task concerns and personal or interpersonal needs when moving toward decisions and action.	18.6	65.7	4.9	0

Note. SA=strongly agree, A=agree, D=disagree, and SD=strongly disagree. In those cases where the sum of the responses do not total 100%, answers were omitted.

indicated in Table 1, a majority of students who engaged in group work found their experiences to support all of the variables designed to measure their orientation to change, manner of processing, and ways of deciding. All students completed this survey, including those who took *VIEW* and those who did not.

Participants specifically noted that their group work experience was neither suffocating nor draining, and that ways of working with ideas, levels of structure, handling information, and balancing the concerns of individuals and the task at hand were helpful to them in working cooperatively.

When examining those areas where students indicated the highest levels of disagree or strongly disagree, it seems that certain trends emerge. While most students seemed willing to accept, or welcome, a certain level of structure with regard to group tasks, a number expressed a certain level of discomfort at their group's level of attention to managing that structure or the need to conform to group expectations. Approximately 60% of students felt that working in a group increased their energy, and a number expressed concerns with how their group handled information or balanced task concerns with personal or interpersonal considerations. Overall, however, most students seemed satisfied with most aspects of their cooperative group experiences. These findings are in keeping with prior findings that working in groups becomes more accepted over time (Murdock, 2003; Norlander-Case, Reagan, & Case, 1999).

The study's second research question examined whether differences in the satisfaction with group work experiences resulted between those students whose groups had been formed using data generated from the *VIEW* and those whose groups had been formed using traditional methods. Table 2 examines differences between the control

Table 2 Control Group and Treatment Group Perceptions of Cooperative Group Experiences

	Control Group (n=40)			Treatment Group (n=62)		
	M	SD	SEM	M	SD	SEM
The amount of attention my group gave to ideas or options that were novel worked well for me and felt comfortable.	2.12	2.84	.45	.82	1.15	.14
The extent to which my group asked its members to respond or react to novel or unusual ideas was a good “fit” for my natural preference.	2.35	3.02	.47	1.11	1.52	.19
The extent to which my group expected me to come up with or contribute novel ideas was comfortable and fit me well.	1.57	2.41	.38	.80	.53	.06
The amount of attention my group gave to managing the structure of the tasks we tackled worked well for me and felt comfortable.	1.85	2.35	.37	.96	1.22	.15

The extent to which my group asked its members to create and conform to structure in dealing with tasks was a good “fit” for my natural preference.	2.52	3.02	.47	1.21	1.84	.23
The extent to which my group allowed me to come up with or contribute to the structure to our tasks was comfortable and fit me well.	1.45	2.18	.34	.62	.57	.07
The amount of attention my group concentrated on and structured authority caused it to be near enough so that it was helpful.	3.00	3.30	.52	1.41	2.27	.28
The amount of attention my group concentrated on and structured authority caused it to be so near that it was suffocating.	3.27	2.38	.37	3.09	2.12	.26
I was able to use my own inner energy as a consequence of working with members of my group.	4.30	4.02	.63	2.77	3.37	.42

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Working in a group built up and increased my energy for the tasks on which we worked.	1.97	2.48	.39	1.33	1.64	.20	
Working in a group drained my energy for the tasks on which we worked.	2.75	2.70	.42	2.32	1.78	.22	
Working with my group assisted in providing me with a learning environment that helped me better understand the tasks at hand.	1.55	2.54	.40	1.14	1.91	.24	
The extent to which my group allowed me to contribute to our learning environment was comfortable and fit me well.	1.72	2.44	.38	.85	1.21	.15	
Working with my group allowed me to handle information in a way that was natural for me.	2.15	2.63	.41	.90	.74	.09	
I used different ways of handling information when solving problems in ways that were natural for me.	2.37	3.08	.48	.95	1.49	.19	

My group allowed me to come up with or contribute to the different ways we handled information when solving problems.	2.92	3.55	.56	1.11	1.54	.19
My group balanced task concerns and personal or interpersonal needs of group.	1.85	2.70	.42	.87	1.16	.14
I was able to come up with or contribute to ways of balancing task concerns and personal or interpersonal needs of group members.	2.15	2.85	.45	1.16	1.23	.15
My group balanced task concerns and personal or interpersonal needs when considering the most important aspects of a problem.	3.02	3.33	.52	1.45	2.25	.28
My group balanced task concerns and personal or interpersonal needs when moving toward decisions and action.	2.47	3.17	.50	1.17	1.75	.22

Note. M=mean, SD=standard deviation, and SEM=standard error mean.

group and treatment group regarding their perceptions of their cooperative work.

It is with regard to the information contained in Table 2 that differences between the control and treatment groups begin to emerge. Where lower scores indicate a higher level of agreement with the survey items, the students whose groups were formed using *VIEW* data indicated more satisfaction with their group experiences than did those students whose groups were formed using more traditional methods. Members of the treatment groups expressed higher levels of satisfaction with how their groups responded to new or novel ideas, how they created, managed and conformed to structure, how information was processed, and how task concerns were balanced with personal and interpersonal needs. These differences led to further analysis which would indicate whether any of these were statistically significant.

The third and final research question of the study explored whether the differences in group satisfaction between members of the treatment and control groups were statistically significant. After confirming that certain assumptions related to the data made ordinal regression an appropriate means of analysis, calculations were performed that yielded the data contained in Table 3. This data examined whether any of the differences observed between the control and treatment groups in Table 2 was statistically significant.

Due to the need to run multiple comparisons related to the 21 survey items, Bonferroni corrections were made that sought to control the familywise error rate so that p would remain less than .05. The Bonferroni corrections indicated that only those predictions generated that were at or below the significance level of .002 might be considered statistically significant. The data indicate that differences between the control and treatment groups with regard to six survey items were statistically significant at the .001 level.

Table 3 Results of the Ordinal Regression with Treatment Predictor

	B	SE	Wald	df	Sig.	Pseu R2	Exp (B)
The amount of attention my group gave to ideas or options that were novel worked well for me and felt comfortable.	1.53	.47	10.4	1	.001*	.24	4.66
The extent to which my group asked its members to respond or react to novel or unusual ideas was a good “fit” for my natural preference.	1.25	.45	7.73	1	.005	.17	3.49
The extent to which my group expected me to come up with or contribute novel ideas was comfortable and fit me well.	.50	.42	1.40	1	.236	.11	1.65
The amount of attention my group gave to managing the structure of the tasks we tackled worked well for me and felt comfortable.	1.16	.42	7.65	1	.006	.10	3.21

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	The extent to which my group asked its members to create and conform to structure in dealing with tasks was a good “fit” for my natural preference.	1.52	.43	12.18	1	.001*	.18	4.60
	The extent to which my group allowed me to come up with or contribute to the structure to our tasks was comfortable and fit me well.	.99	.42	5.44	1	.02	.10	2.71
	The amount of attention my group concentrated on and structured authority caused it to be near enough so that it was helpful.	1.43	.42	11.15	1	.001*	.18	4.20
	The amount of attention my group concentrated on and structured authority caused it to be so near that it was suffocating.	-.21	.38	.30	1	.58	.06	.81
	I was able to use my own inner energy as a consequence of working with members of my group.	.56	.39	2.14	1	.14	.08	1.76

Working in a group built up and increased my energy for the tasks on which we worked.	.37	.38	.97	1	.32	.07	1.45
Working in a group drained my energy for the tasks on which we worked.	-.02	.37	.002	1	.96	.002	.98
Working with my group assisted in providing me with a learning environment that helped me better understand the tasks at hand.	.14	.38	.13	1	.71	.01	1.15
The extent to which my group allowed me to contribute to our learning environment was comfortable and fit me well.	.99	.42	5.46	1	.01	.19	2.67
Working with my group allowed me to handle information in a way that was natural for me.	1.38	.42	10.48	1	.001*	.15	3.99
I used different ways of handling information when solving problems in ways that were natural for me.	1.43	.44	10.54	1	.001*	.20	4.19

My group allowed me to come up with or contribute to the different ways we handled information when solving problems.	.97	.42	5.20	1	.02	.06	2.62
My group balanced task concerns and personal or interpersonal needs of group.	.96	.45	4.37	1	.03	.18	6.42
I was able to come up with or contribute to ways of balancing task concerns and personal or interpersonal needs of group members.	.52	.40	1.69	1	.19	.09	1.68
My group balanced task concerns and personal or interpersonal needs when considering the most important aspects of a problem.	.44	.40	1.25	1	.26	.12	1.56
My group balanced task concerns and personal or interpersonal needs when moving toward decisions and action.	1.37	.42	10.35	1	.001*	.21	3.96

Note. * $p < .002$. McFadden (1974) created a popular well-known pseudo R^2 procedure and has written extensively about this subject. McFadden suggested that a pseudo R^2 score between 0.2 and 0.4 “represent an excellent fit” (1978, p. 307).

A statistically significant greater number of members of the treatment group reported that the amount of attention their group gave to ideas or options that were novel worked well for them and felt comfortable than did members of the control group. This level of satisfaction is important, as it permits group members to engage in a pursuit of new ideas at a level each finds appropriate. Similarly, a statistically significant greater number of the treatment group felt that their groups asked their members to create and conform to structure in dealing with tasks in ways that resulted in a good “fit” for their natural preference and that their group concentrated an appropriate amount of attention on authority and structured it in such a way that it was near enough so as to be helpful. Again, as individuals have varying amounts of need for structure and attention to authority when problem solving, having greater numbers of students in groups that fit their needs increases their satisfaction with the process and escalates the time spent on task.

A statistically significant number of students who were grouped using *VIEW* results also indicated a greater level of satisfaction with how their groups permitted them to handle information and how they were able to handle that information specifically when solving problems. This indicates that students who were in the treatment groups were better able to grapple with those problems facing them, with some choosing to rely upon their internal resources while others elected to seek external views and insights from others when considering how best to solve a problem. Finally, a statistically significant number of students from the treatment group indicated that their groups balanced task concerns and personal or interpersonal needs when moving toward decisions and action. This suggests that those group members who are more person-oriented are more satisfied when their group considers how a given solution will affect others, while those who are more task-oriented prefer groups

that concentrate upon seeking solutions that get the task at hand completed. Permitting students to engage with cooperative groups where others attack problems, work, and devise solutions in more similar ways increases their satisfaction with the process.

Future Considerations

As the students in America's college and university classrooms become increasingly diverse, cooperative grouping is one strategy that can be used to boost student performance (Sharan, 1990, 1994; U.S. Department of Education). College and university instructors seeking an efficient, effective, and expeditious way of grouping students in their classes might do well to consider using *VIEW* to assist them in so doing. Especially in situations where an instructor might be working with students for a single term, *VIEW* provides data regarding each individual's orientation to change, manner of processing, and ways of deciding that would be very difficult to obtain in a short period of time at the beginning of a term or semester. Early access to this information also permits faculty to place students in cooperative groups as early as possible, thus permitting greater benefit to students who are able to engage in the process for a greater period of time.

Colleges and universities interested in increasing the number of their students' cooperative group experiences, or in improving those experiences, might invest in training for instructors regarding some of the dynamics at play and provide *VIEW* testing for those classes where group work plays a major role. Faculty and students who express reluctance to engage in cooperative group work might be more willing to do so if they better understood the dynamics that undergird such an experience. Students who are grouped with those who share a more common orientation to change might also find the experience more enjoyable and

productive, permitting them to more greatly benefit from the experience (Stronge, 2007).

Future studies might investigate how group performance changes if individuals are grouped with those who have a different orientation to change, specifically if explorers are intentionally grouped with developers. It would also be helpful to investigate whether shaping groups using information mostly about each individual's manner of processing and ways of deciding would also affect their group experience. Attempts at sharing information with students about orientation to change, manner or processing, and ways of deciding without administration of *VIEW* might also be examined to determine whether this has an effect on levels of satisfaction with cooperative group experiences.

Conclusion

While group work in classrooms is increasingly popular, with repeated studies demonstrating that student engagement and learning are improved when they work in cooperative groups (Carini, Kuh, & Klein, 2006). As many colleges and universities are trying to improve their students' learning experiences within and out of the classroom, increased use of cooperative grouping for students is desired by many instructors who are working to make this happen (Baer, 2003). Several problems face instructors when attempting to form cooperative groups, however. Many students express a dislike of such work, often based on previous negative experiences (Breneiser, Monetti, & Adams, 2012). Similarly, many instructors remain unconvinced about the value of cooperative group experiences and are unsure how best to go about instituting groups in their classrooms (Missett, Brunner, Callahan, Moon, & Azano, 2014; Sharan, 1994). Finally, the relatively short duration of most college and university classes, and the limited time instructors see students each week, inhibits their ability to use meaningful

knowledge about the students to form their cooperative groups (Carini, Kuh, & Klein, 2006; Sharan, 1990).

We do not yet fully understand what makes some groups more successful than others. A variety of factors converge to make cooperative group work complex, dynamic, and multifaceted. When students are working in groups with those whose orientation to change is similar to their own, however, the findings of this study suggests that their perceptions regarding the efficacy, efficiency, and effectiveness of the group are improved. This permits members of cooperative groups to spend more time working on the tasks at hand and less involved in disputes about how best to proceed. Administering *VIEW* to students before groups are formed, and then using the results of that assessment to place students in groups where others share their preferences for orientation to change and ways of deciding seems to positively affect their perceptions of how well that group functions.

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