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ABSTRACT

This study investigated whether there were differences between classrooms of expert and novice elementary teachers, examining whether teaching experience would affect flexibility in the clasroom, whether teaching experience would influence communications between all members of the classroom, and whether teaching experience would affect the degree of cohesiveness in the classroom. A group of 35 experienced and 35 novice elementary teachers from New York State schools participated. Researchers conducted observations and videotaped the teachers. For each teacher, one 50-minute observation included use of the Classroom Systems Observation Scale (CSOS), an instrument that determines the level of flexibility, communication, and cohesion evident in the elementary classroom. Results indicated that expert teachers' classrooms had significantly higher levels of flexibility within the balanced range of functioning than novice teachers' classrooms. Expert teachers also had a significantly higher level of communication on the CSOS than did novice teachers. However, there was no difference between the groups on the dimension of cohesion. An appendix presents sample items from the CSOS. (Contains 35 references.) (SM)

Running Head: CLASSROOM SYSTEMS OF TEACHERS

Differences in the Classroom Systems of Expert and Novice Teachers

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Abstract

This study uses a systems perspective to examine whether differences exist between classrooms of expert and novice teachers on the Cohesion, Communication, and Flexibility dimensions of the Classroom Systems Observation Scale (CSOS). Principals from 10 private and 8 public schools in New York State identified 35 expert and 35 novice elementary school teachers. One 50-minute observation using the CSOS was conducted for each classroom. Results showed that expert teachers' classrooms had a significantly higher level of flexibility within the balanced range of functioning than novice teachers' classrooms. Expert teachers were also found to have a significantly higher level of communication on the CSOS than novice teachers. No difference between expert and novice teachers' classrooms was found on the Cohesion dimension. These findings will add to the information gathered about systems theory as it relates to the classroom environment.

A major goal of research in education is to examine what variables contribute to the improvement of students' learning and achievement. Students spend up to six hours in a school setting, while elementary students in particular spend the majority of this time in one classroom interacting with each other and the teacher; it is important that researchers understand what factors influence students' learning in this setting.

Research on learning environments has examined the influence of the classroom in relation to affective and cognitive student outcomes. Wang, Haertel and Walberg (1993) reviewed the literature on education to identify factors that may influence students' learning. Results indicate that classroom management, as well as academic and social interactions between students and teachers had a direct influence on students' learning. "Positive teacher and student social interaction contribute to students' sense of self-esteem and foster a sense of membership in the classroom and school" (Wang, Haertel & Walberg, 1993, p. 277).

Many studies on learning environments have been conducted on how students perceive their classroom environment and its affect on them. In a review of literature on learning environments, Fraser (1986) found a relationship between students' perceptions of the classroom environment and their attitude towards learning and academic performance. Studies on the classroom environment show that relationships exist between students' perceptions of the learning environment and their sense of responsibility to

perform well in class (Wang & Walberg, 1986), their attitude and knowledge of the subject being taught in class (McRobbie & Fraser, 1993), and scores in English and math (Byrne, Hattie, & Fraser, 1986). Overall, these studies show that the classroom environment has an influence on the student socially, emotionally, and academically.

Case studies, observations, and self-report instruments to assess perceptions of teachers and students have been used by researchers to assess learning environments (Fraser, 1991). For instance, many instruments have been developed to assess students' and teachers' perceptions of their classroom environments such as Learning Environment Inventory (Fraser, Anderson, & Walberg, 1982), the Classroom Environment Scale (Moos & Trickett, 1974), and My Class Inventory (Fisher & Fraser, 1981). These self-report instruments assess respondents' perceptions of the classroom environment, and thus give a subjective view of the learning environment. The Classroom Systems Observation Scale (CSOS) (Fish & Dane, 1995) is one instrument that evaluates dimensions of the classroom environment using an outside, objective observer. The CSOS is used to assess the functioning of the classroom from a systems perspective (Fish & Dane, 1995).

Systems theory posits that interactions and events that occur in the classroom environment influence all members. Circular causality, recurring interaction patterns among

individuals, can be seen as constantly operating in the classroom environment. For example, teachers' beliefs influence their behavior which in turn influences students' beliefs and behaviors towards themselves and others, which then influences teachers' beliefs. With this perspective in mind it is important to identify what teacher beliefs and/or characteristics influence the classroom system.

"Everything the teacher does, as well as the manner in which he does it, incites the child to respond in some way or other, and each response tends to set the child's attitude in some way or other" (Dewey, 1960, p.59). One characteristic that has been shown to influence the system of the classroom is teachers' experience. Research has shown that teachers' experience influences how teachers react in a classroom, such as presenting a lesson (Cleary & Groer, 1994; Livingston & Borko, 1989; Westerman, 1991), disciplining their class (Sabers, Cushing, & Berliner, 1991), and dealing with change (Cleary & Groer, 1994, Livingston & Borko, 1989; Westerman, 1991).

As mentioned previously, the classroom environment has been shown to influence students' performance and attitudes. A main figure in the classroom is the teacher who some believe "significantly influences the psychological climate of his class" (Tonselson, 1982, p. 98). This study seeks to investigate whether teachers' experience influences the level of communication, cohesion and flexibility in the classroom.

Systems Theory

All systems have general characteristics that are true whether it be a human system, the solar system, the family system, or the school system. General systems theory looks at the whole picture and the interaction of component parts with each other, as opposed to looking at the component parts as separate and unrelated (Becvar & Becvar, 1982; Nichols & Everett, 1986). Systems theory is an approach that goes beyond looking at the interaction between two people; instead it investigates the interaction of all members and how the various relationships influence that system.

Systems theory has been frequently used when working with families. The conditions that are found to exist in the family system can also be discovered in the classroom system (Conoley, 1987; Lightfoot, 1978). Conoley (1987) found that schools and families are functionally, structurally, and culturally similar. The classroom is a complex system composed of the teacher, the students, and the transactions among them. The classroom, like the family, has a certain structure. Structure describes established transactional patterns in which group members interact. It consists of covert rules and a hierarchical structure that controls interactions (Minuchin, 1974; Nichols & Schwartz, 1995). In the classroom the teacher is at the top of the hierarchy and the classroom, like most groups, has overt and covert rules. During the first week of school, the teacher will

usually state the rules of the classroom and have a listing of them posted on a wall. In addition, there are also unspoken rules, such as turn taking in group discussions or when one is allowed to leave one's seat without permission (e.g., sharpening pencils or throwing away garbage).

Circular causality, and homeostasis are also important concepts that are essential parts that make up the framework of systems theory. Circular causality is a "series of interacting loops or repeating cycles" (Nichols & Schwartz, 1995, p. 590). Circular causality in the classroom can be demonstrated when a teacher's communication to students influences how the students behave in the classroom which in turn affects how the teacher reacts to the students. A system always strives to maintain the status quo. Homeostasis refers to a system's ability to regulate itself so it maintains balance and consistency when outside influences try to exert change (Nichols & Schwartz, 1995). The members of the classroom are always trying to maintain homeostasis by regulating themselves because of influences from external sources (e.g. school environment). For example, when an assembly disrupts the class' daily schedule the teacher will strive to maintain regularity in the classroom by following classroom routines and rules as much as possible.

Minuchin, a proponent of systems theory, expanded on the basic tenets of general systems theory to include adaptation and identity. Adaptation, refers to a group adjusting to new

circumstances that occur due to developmental and situational changes. A teacher must be aware of what is occurring in the classroom and be flexible enough to alter his or her plans when necessary. There are times when students do not understand a particular lesson and a teacher must be able to recognize this and adapt to the needs of his or her students. Furthermore, a teacher must be aware of the students and the emotional problems they may be experiencing and take this information into account when enforcing rules or administering punishment.

Another component, the matrix of identity, gives the child a feeling of association with the group and at the same time encourages individualism. The class helps foster a child's sense of membership along with a perception of discrete uniqueness. The child belongs to a class that has its own set of rules, routines, and space (Fish & Jain, 1988). Here the child functions as part of the group and will identify himself or herself as belonging to that particular class. For example, during recess students from the same class will usually play together, possibly even competing together as a team against other classes. Within the classroom the child is a separate individual, with special talents, abilities, and a unique and distinct personality. From a classroom systems' perspective, one wants to promote both a student's sense of belongingness and his or her separateness.

One technique to evaluate the system of the classroom is the Classroom Systems Observation Scale (CSOS) (Fish & Dane, 1995). This is an observational instrument that evaluates the interaction between all members of the classroom on three dimensions: level of flexibility, cohesion, and communication. The CSOS is based on the Circumplex Model of Marital and Family Systems (Olson, Russell, & Sprenkle, 1989) and consists of three dimensions: Cohesion, Communication, and Adaptability. Two family instruments, FACES and the Clinical Rating Scale, use these dimensions to describe family functioning (Olson, Russell, & Sprenkle, 1989). The CSOS consists of the same three dimensions, except that adaptability is referred to as flexibility. A balanced system is considered to exist when there is equilibrium between two opposite conditions. For example, for the flexibility dimension the scores may fall between the extremes of chaotic on one end of the distribution or rigid on the other end, if the score falls in the middle on the range, in the flexible or structured area, then it is considered to be balanced.

The classroom system has many aspects that can affect students' performance. Because the teacher plays such a pivotal role in the classroom, his/her experience may have an influence on the classroom system.

Experienced vs. Novice Teachers

Research has examined the differences that exist between experts and novices in various areas. A review of the literature on experts and novices by Chi, Glaser, and Farr (1988) found that within their particular domain, experts have superior self-monitoring skills, are able to examine a problem qualitatively, solve problems quickly and fairly accurately, and can process large meaningful patterns within their subject area. Furthermore, in other studies experts have consistently been shown to have a more elaborate knowledge base and perceive problems on a deeper, more complex level than novices (Gallagher, 1994; Weinert, Schrader, & Helmke, 1990).

Research on expert and novice teachers has utilized two main approaches to collecting data. Some investigators (Carter, Cushing, Sabers, Stein, & Berliner, 1988; Sabers, Cushing, & Berliner, 1991) have examined these differences by presenting videotapes or slides of a classroom lesson to teachers and asking for their interpretations. In the other technique the researcher observes a lesson, takes extensive notes and/or tapes the lesson, and questions teachers about their lesson both before and after they teach (Cleary & Groer, 1994; Leinhardt, 1989; Livingston & Borko, 1989; Westerman, 1991).

Results have shown that experts are more capable than novices at comprehending and describing classroom phenomena in-depth (Carter et al., 1988; Peterson & Comeaux, 1987; Sabers et

al., 1991). In addition, these studies have found that experts used students questions and responses to guide discussion (Cleary & Groer, 1994; Livingston & Borko, 1989; Westerman, 1991), were more flexible, more able to connect students' questions to the lesson (Leinhardt, 1989; Livingston and Borko, 1989; Westerman, 1991), used more interactive decisions (Cleary & Groer, 1994), and were able to interpret students' behavior (Carter et al., 1988; Sabers et al. 1991). Furthermore, experts were able to offer possible solutions for problems that they observed in the classroom (Sabers et al., 1991).

In contrast, novices had difficulty presenting their lessons in a connected and meaningful way (Leinhardt, 1989) and were more concerned about their teaching effectiveness over student understanding (Livingston & Borko, 1989; Westerman, 1991). Furthermore, novice teachers did not pick up on students' cues nor did they deviate from their lesson plans (Cleary & Groer, 1994).

Results from these studies show that expert and novice teachers react differently to their students and the way they present a lesson. "Teaching is a complex act requiring the moment-by-moment adjustment of plans to fit continually changing and uncertain conditions" (Lampert & Clark, 1990, p. 21). In order to be flexible, a teacher must be aware of what is occurring in the classroom and be willing to adapt. Because expert teachers are more sensitive to the performance cues from

students than novice teachers (Borko & Shavelson, 1990), they will be able to adapt the lesson so that the students will understand. Novice teachers are more structured and spend more time focusing on lesson content and discipline, and less time reacting to and altering their plans to meet their students' needs. If a teacher is adapting a lesson to meet students' concerns and needs, this should help the student learn the information. Therefore, flexibility is an important skill for teachers to acquire.

Most of the research that examined differences in teachers based on experience have not investigated the effects of these differences on the system of the classroom. The purpose of this study is to investigate whether teachers' experience is related to the cohesion, flexibility, and communication dimensions of the CSOS at an elementary school level. This information will be useful to help teachers and other school personnel determine possible causes for an unbalanced classroom environment and design appropriate interventions to help improve the classroom system. Research on learning environments has found that a relationship exists between students' affective and cognitive outcomes and their perceptions of the classroom environment (Fraser, 1986). Therefore, helping to improve the classroom system will benefit the students on a cognitive, social, and emotional level. This study seeks to answer the following questions: (1) Does a teacher's experience influence the

communications between all the members of the classroom? (2) Do experienced teachers have a more flexible classroom than novice teachers? (3) Will teachers' experience affect the degree of cohesiveness in the classroom? Based on the findings of previous research, the following hypotheses are proposed:

1. Classrooms with expert teachers will obtain a score that reflects a more balanced flexibility score than classrooms with novice teachers on the Flexibility dimension of the CSOS.
2. No differences will be found between classrooms of expert and novice teachers on the Cohesion and Communication dimensions of the CSOS.

METHODS

Participants

The sample consisted of 35 experienced and 35 novice elementary school teachers from 18 schools in New York State. The schools consisted of nine private and eight public schools in an urban region, and one private school in a suburban region. Teachers who had less than one full year of teaching experience were considered novices. Teachers who displayed exceptional teaching ability as per principal nomination, had five years or more teaching experience, and had one or more years experience at their present grade level were considered expert teachers. The

average number of years for experienced teachers was 18 years, with a range from 5 to 43 years.

Measure

The Classroom Systems Observation Scale (CSOS) (Fish & Dane, 1995) is an observational instrument that is used to determine the level of Flexibility, Cohesion, and Communication evident in an elementary school classroom (See Appendix A for sample items from the scale). Flexibility is determined by the level of adaptability of the teacher and students in the classroom. The level of Cohesion in the classroom is determined by the emotional bonding and supportiveness among the students as well as between the teacher and the students. Both the Flexibility and Cohesion dimensions of the scale are curvilinear, where the outer two levels represent unbalanced functioning, and the two mid-levels represent balanced functioning. The four levels of flexibility are: rigid (very low), structured or flexible (moderate), and chaotic (very high). Cohesion also has four levels which are: disengaged (very low), separated or connected (moderate), and enmeshed (very high). The Communication dimension is reflected in the exchange of thoughts, feelings, and ideas in the classroom. The Communication dimension is linear, ranging from low to high.

The interrater reliability for the three dimensions are: Cohesion (.83), Flexibility (.89), and Communication (.61). In addition, the test-retest reliability for the 3 dimensions:

Cohesion (.64), Flexibility (.44) and Communication (.54) are moderate (Ishofsky, Fish, & Sullivan, 1995). The CSOS has also been shown to have adequate construct validity (Berkson, Berger, Fish, & Dane, 1995).

Procedures

Consent was obtained from principals to conduct research in their schools. The principals identified novice and expert teachers in their schools using the criteria described above. After the principals nominated the teachers, the identified teachers were informed about the study and their consent to be observed was obtained.

Two researchers, one graduate student and the other the author, collected the data for the pilot study which consisted of 20 observations (10 expert and 10 novice teachers). Both of these researchers were trained by an expert using videotaped classroom situations. In addition, practice observations in classrooms were conducted as part of the training process. The two researchers obtained an interrater reliability score of .80 with an expert prior to the collection of the data. For the next 50 observations, interrater reliability for the three dimensions for this study was obtained by the author and another graduate student for 20% of the observations. Cohesion (.80) was significant at the $p<.01$ level, and Flexibility (.63) and Communication (.68) were significant at the $p<.05$ level.

One 50-minute classroom observation using the Classroom Systems Observation Scale was conducted by the researcher for each teacher. In all instances, the researcher sat in the back of the classroom to observe and record results.

Results

A series of t tests were employed to determine whether differences exist between experienced and novice teachers on the Communication, Cohesion, and Flexibility dimensions of the CSOS. Descriptive statistics for novice and experienced teachers on the three dimensions of the CSOS are presented in Table 1. The results on the Flexibility dimension of the CSOS indicated that experienced teachers' classrooms were significantly more flexible than novice teachers' classrooms, ($t=-3.497$, $df=68$, $p=.001$). The results on the Communication dimension of the CSOS showed that experienced teachers' classrooms had a significantly higher level of communication than novice teachers' classrooms, ($t=-2.014$, $df=68$, $p=.048$). No significant differences were found on the Cohesion dimension ($t=-1.251$, $df=68$, $p=.215$). This shows that novice and experienced teachers' classrooms do not differ on the level of support and bonding among members of the class.

Table 1

Means and Standard Deviations for Teacher Experience

Dimensions of CSOS	Novice Teacher Mean	SD	Expert Teacher Mean	SD
Cohesion	2.18	.35	2.27	.27
Flexibility	1.89	.27	2.09	.22
Communication	3.50	.49	3.74	.52

Discussion

This study evaluated the classroom using a systems perspective. Systems theory investigates the interactions among members of a group and the affect that these group members have on each other as well as their affect on the basic nature of the group itself. The present study investigated whether teacher experience has an influence on the classroom system.

As predicted, teachers' experience was shown to be related to the level of flexibility in the classroom. Expert teachers were shown to have a statistically significant higher level of flexibility in their classrooms than novice teachers. This demonstrates that teacher experience does affect how much change and adaptability occurs in the classroom. The teachers' ability to be responsive to students and adapt lessons based on what occurs in the classroom has been demonstrated in previous research (Leinhart,

1989; Livingston & Borko, 1989; Westerman, 1991). In contrast, novices have difficulty picking up student cues or deviating from their lesson plans (Cleary & Groer, 1994). On the Cohesion dimension of the CSOS no significant difference was found between expert and novice teachers' classrooms. This suggests that teachers' experience does not influence members' sense of belonging. This supports the hypothesis.

It was predicted that communication would not differ based on teachers' experience. This hypothesis was not supported. Expert teachers' classroom were shown to have a significantly higher degree of Communication. The Communication domain of the CSOS has been defined as having classrooms with the following characteristics: "open discussion related to the topic, attentive listening, clarity of message, and continuity of material presented" (Fish & Dane, 1995). Research on expert and novice teachers confirms some of this definition. Because experts are more concerned than novices that students understand the information presented in lessons (Livingston & Borko, 1989) and they use students' questions and responses to guide discussion (Cleary & Groer, 1994), they may encourage more open discussions in the classroom. In relation to clarity and continuity of the lesson, experts have an ability to connect past lessons with current lessons (Leinhardt, 1989; Westerman, 1991) while novices had difficulty presenting their lessons in a connected and meaningful way (Leinhardt, 1989). Furthermore, when questioned,

novices are unable to remain on topic and connect the students' questions to previous or current lessons (Livingston & Borko, 1989; Westerman, 1991).

One limitation to this study was that the majority of the observations occurred in an urban setting. Thus, the results of this study could not generalize to rural or suburban areas. Another limitation of this study is the definition of an expert teacher as someone nominated by the principal. When asked to nominate expert teachers some principals stated that they would consider most of their teachers as experts in the field of teaching. It may be more appropriate to consider the results of this study differences between experienced and novice teachers.

Future research could examine if there is a relationship between the classroom system and student achievement. Burden and Fraser (1993) state that the impetus has moved from studying individual characteristics such as intelligence to a more systemic approach to explain the learning process. Previous research has shown a relationship between some classroom environment factors (e.g. Cohesiveness, Order and Organization, and Rule Clarity) and students' achievement (Byrne, Hattie, & Fraser, 1986). Another area that could be investigated is whether the three dimensions of the CSOS differ for primary (K-2) and middle elementary grades (3-6). In addition, future research could investigate whether observations of different subjects (e.g., math, science, social studies, and reading) would produce different

results on the Cohesion, Flexibility, and Communication dimensions of the CSOS.

This research can benefit many members of the school environment. This study has demonstrated that novice teachers have classrooms that are less flexible and lower in communication than expert teachers. An increase in hours spent in the school as a student teacher and college lessons geared to help student teachers reflect and think about their teaching (Livingston & Borko,1989) may be an effective technique to help improve these two areas. This information supports the use of mentors for new teachers. The CSOS could be used by mentors to help identify areas to be strengthened for new teachers. With this information the mentor and the novice teacher could work together to develop appropriate interventions which may improve educational practices within the classroom. A classroom that has a higher degree of flexibility and communication will benefit both the teacher and the students.

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Appendix A

Table 1
Sample Items from the Classroom Systems Observation Scale

	Classroom Cohesion
Emotional Bonding	
C-1	Teacher encourages class to work as a group.
Supportiveness	
C-16	Students assist other students with academic work.
Boundaries	
C-17	Students share classroom space.
	Classroom Flexibility
Leadership	
F-4	Teacher is responsive to students' need for orientation.
Discipline	
F-6	Teacher considers circumstances in enforcing consequences.
Negotiation	
F-9	Decisions made through teacher-student compromise.
	Classroom Communication
Listener's Skills	
CO-1	Teacher listens to students without interrupting.
Self-disclosure	
CO-9	Teacher speaks about friends & families with students.
Clarity	
CO-10	Teacher verbal messages are clear & consistent.

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