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Teacher Variables, Classroom Structure and Student Achievement

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Abstract

The focus of this review is to examine teacher variables, classroom structure and student academic achievement. The available literature on job satisfaction, motivation, and creativity relating to the teaching profession, relationships between teacher variables and student achievement and the effects of single-grade and multi-grade classroom structure on student achievement is reviewed. The scope of the review includes teacher job satisfaction, teacher motivation, teacher creativity, teacher variables and student achievement and classroom structure. There appears to be a link connecting teacher job satisfaction, teacher motivation and teacher creativity. Investigations assessing relationships among teacher variables and student achievement, and comparisons of student achievement between classroom structures have yielded mixed and contradictory results.

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Teacher characteristics, classroom structures and student achievement have been the focus of numerous studies. Literature examining teacher characteristics as predictors of student academic achievement has yielded mixed results. Similarly, evidence from examinations between single-graded and multi-graded classroom structures and their effects on student achievement has been contradictory. This review examines teacher job satisfaction and motivation, two variables lined with student achievement. Links are also reported between three teacher variables, (job satisfaction, motivation, and creativity) as potential predictors of student academic achievement and introduces an additional variable of classroom structure (single-grade/multi-grade). It is reasonable to hypothesize that existing relationships of selected teacher variables and student achievement could interact with additional variables, in this case, classroom structure.

Relationships between teacher variables and student achievement suggest future research to clarify previous results of differences in student performance between classroom structures.

Teacher Job Satisfaction

Past theories concerned with the constructs of job satisfaction, motivation and their relationships to work performance include Freud's personality theory of the id, ego and superego, Maslow's human need theory, Cammann's quality of work life movement and Hackman and Oldman's job design theory. From their research it can be suggested that teachers' levels of job satisfaction and motivation may affect their work performance and that these variables could be strong indicators of the educational process (Cheng, 1996; Czubaj, 1996).

Investigations have examined the impact of the work environment and job satisfaction on teacher behavior and student performance. Teacher job satisfaction has been shown to have a significant positive relationship to student academic achievement and work motivation

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(Baughman, 1996). Baughman's investigation into teacher job satisfaction resulted in five factors that were shown to have the strongest relationship to teacher job satisfaction. Engaged teacher behavior (high morale, supportive staff and trust and friendship among faculty), supportive principal behavior (social and task achievement needs of school staff), academic emphasis (degree the school is driven toward academic excellence), frustrated teacher behavior (focus is on teaching and learning as opposed to rules and procedures), and morale (school environment of friendliness, openness and trust) were all strong predictors of teacher job satisfaction.

Research has suggested that personal investment and job commitment of teachers is critical for an effective work culture and teacher dissatisfaction will contribute to both the suffering of teachers and students (Wu & Short, 1996). Professional growth, self-efficacy, and status were predictors of teacher job satisfaction. The degree to which a teacher identifies with the school, is also an indicator of job satisfaction (Ma & MacMillan, 1999). Additional indicators of teacher job satisfaction include teachers' perceived ability to positively contribute to the school, conditions that allow a teacher to feel valued in the school, and teachers' individual perceptions of cooperative and meaningful school involvement (Ma, & MacMillan, 1999).

It is suggested that suggests that job satisfaction or dissatisfaction is a perceived relationship between what an individual wants from their job and what an individual perceives they are receiving from the job (Luce, 1998). Davis & Wilson (2000) give their overview of teacher job satisfaction. They state that having choice within the work environment promotes "flexibility, creativity and initiative...while having little choice leads to feelings of being controlled, tenseness, negative emotions" (p. 3), job stress and job dissatisfaction.

Teacher Motivation

There are numerous studies on motivation and the educational process with the learner being the focus of the research. There is existing but limited research with teacher motivation as the focus.

Intrinsic Motivation

Researchers distinguished between intrinsic and extrinsic rewards. Intrinsic motivation means doing a task for its own sake. Rewards are personal and one receives emotional benefit from the task itself or in this case, the teaching job. An example of this is professional development and personal achievement. Extrinsic motivation means doing a task in order to receive something else. Rewards are tangible and concrete. An example of this is job salary and benefits. Of intrinsic and extrinsic motivation, the former plays a greater role in teacher motivation and teacher job satisfaction (Ellis, 1984; Latham, 1998).

The major dynamics involved in loving teaching is teacher motivation and teacher efficacy (Czubaj, 1996). Teacher efficacy, is the concept that teachers believe that their beliefs and behaviors directly affect students. When a teacher is intrinsically motivated, students can benefit from this and learn to love education (Czubaj, 1996).

Expectancy theory is used to argue that both intrinsic and extrinsic play a role in teacher behavior. Teachers are moved into action when they believe that a particular goal will result in desired outcomes (rewards) and when they believe the goal is attainable. If their experience has shown them that particular goals are difficult to achieve, their expectations run opposite to the goals. For example, if teachers believe students cannot reach new curriculum standards or that

they will not be supplied with adequate resources, extrinsic, tangible rewards will be insufficient to motivate teacher behavior (Lashway, 1999).

Needs and Drives

There are seven suggested “needs” for teacher motivation. They include “group inclusion, trust, ontological security, avoidance of anxiety, symbolic/material gratification, maintenance of self-concept, and a sense of facility” (Czubaj, 1996, pg. 4). Teachers claim that if they can reach students and they are successful, this is a drive, and a reward for their effort. Within the construct of motivation is a higher self, which is a drive or state without stress. To function at a higher self is to contribute, to learn for its own sake, to be productive and creative and to perform at the highest level to achieve intrinsic satisfaction (Czubaj, 1996).

* Studies have shown that teacher motivation is linked with teacher job satisfaction. Significant positive relationships exist between principal’s empowering behaviors and teacher motivation, and teacher motivation and teacher job satisfaction. Principals play an important role in maintaining teacher empowerment (referred to as motivation) and job satisfaction. Principals can nurture teachers’ intrinsic motivation by fostering a cooperative, collaborative and encouraging school environment (Davis & Wilson, 2000).

Similar theoretical approaches are the cognitive model of intrinsic empowerment and the model of self-determination. Generally stated, teachers’ behaviors are the result of personal choices and by the work environment (Davis, & Wilson, 2000). The cognitive model of intrinsic motivation is a four-factor model. These factors include: impact (the degree to which one perceives his/her own behavior as producing the intended effects, competence (perceived skill at

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a given task), meaningfulness (perceived value of the task goal), and choice (intentional selecting of behaviors that will promote desired outcomes) (Davis, & Wilson, 2000).

Brunetti (2001) postulated two questions in researching teacher motivation and satisfaction. Are high school teachers satisfied with their work? Of those who are satisfied, what are the sources of motivation to stay? High teacher job satisfaction rates were reported. Reasons as to why teachers remained at their jobs included salary, benefits and serving society as well as seeing students learn and grow, an intrinsically motivated factor. When teachers were asked what they liked most about their job, 89 percent responded with intrinsic factors such as having an impact on a child's life and watching a child's development. Extrinsic factors such as having summers off were identified by only 3 percent of the teachers surveyed (Latham, 1998).

Extrinsic rewards such as salary may serve to reduce job dissatisfaction but intrinsic rewards such as personal development and classroom enjoyment are what contribute to job satisfaction (Luce, 1998).

School Culture

It has been suggested that school culture is also a contributor to teacher motivation and job satisfaction. School culture is defined as the historically transmitted degrees of values and beliefs of the school community (teachers', students' and principals') (Stolp, 1994, p. 1). Five dimensions of school culture have been outlined in the literature.. They include academic challenges, comparative achievement, recognition for achievement, school community and perception of school goals (Stolp, 1994). School culture is an important factor that correlates with student achievement, student motivation, teacher motivation, and teacher job satisfaction

(Cheng, 1993; Stolp, 1994). Positive school cultures have been correlated with higher teacher motivation and higher teacher job satisfaction (Stolp, 1994).

Teacher Creativity

Early theories of creativity include sequential multiple-step processing models by Dewey and Wallas. Each of the early models included a preparation stage (formulation of the problem), an incubation stage (setting the problem aside), and illumination stage (achieving insight into the problem), and a verification stage (testing the solution). Torrance developed a similar model and added a fifth stage of actually doing something with the idea or solution (Glass, Holyoak & Santa, 1979; Starko, 1995; Libby, 1994; Solso, 1988).

The Geneplore model of creativity is the process by which an individual generates, refines and regenerates mental representations of task demands and goals. Generation and exploration are the two dimensions within this model. In the generation phase, an individual constructs incomplete mental representations. These are referred to as pre-inventive structures. This initial process prompts further creative activity in the exploration phase. In this phase of creative behavior the pre-inventive structures are refined and modified to meet the goals of the task at hand (Bink & Marsh, 2000).

The Componential Model of creativity contains three major components. Domain-relevant skills are basic skills that lead to competent performance in a given area. Creativity-relevant skills involve skills that aid in creative performance in multiple areas (cognitive style, working style and divergent thinking abilities). Task motivation involves motivational variables that

establish an individual's approach to a given task. General skills contribute to creativity and give less support to a domain-specific approach to creativity.

A complementary model to the componential model is the Creativity Intersection Model (Conti, Coon, & Amabile, 1996). The Creativity Intersection Model is the most appropriate model in the context of teaching as it connects three areas crucial to creativity. The three components of the model are domain skills, creative thinking and working skills, and intrinsic motivation. In order for creative activity or behavior to occur, all three components must be in place (Conti, Coon, & Amabile, 1996). The teaching profession will be used as an example to explain the three components of the Creativity Intersection Model. Within domain skills an individual must be trained as an educator, within creative thinking and working skills a teacher must look at a task (eg. teaching a class lesson) from many viewpoints), and within intrinsic motivation a teacher must love or have a passion for teaching.

Three hallmarks of intrinsic motivation identified by Amabile include interest, competence and self-determination. Interest is an individuals' will to be more motivated to do something that is of interest rather than boring. Competence is an individual's will to move them self into action if the individual is confident in their ability to perform a specific task. Self-determination is a sense that an individual exhibiting a behavior because of their own reasons, because they have chosen to do so and not for someone else's reasons (Starko, 1995). Amabile's theory is summed up by stating that it is important for people to "foster the motivation and positive attitudes that keep individuals' committed to a task long enough for exploration, problem finding, and creative thinking to take place" (Starko, 1995, pg. 119).

Adult Creativity

All people have creative ability (Segal, 2001). Research on adult creativity has suggested that creativity is dependent on many social factors. These factors include social environment, cultural values, attitudes and practices (Kerka, 1999). An individual can have the potential for creativity, but potential alone is not sufficient for creative productivity. A combination of factors is needed for creative achievement. These factors include intelligence, perseverance, and social and cultural factors. It is argued that if any one of the factors is missing, creative achievement will not result (Martindale, 1996).

Although creativity research has not focused on teachers' specifically, there is a body of work available. With regards to gender statistically significant differences have been reported between men, women and levels of creativity while insignificant outcomes have also been reported (McElvain, J.L., Fretwell, L.N., & Lewis, R.B., 1963).

Dr. Paul Torrance is one of the leading researchers in creativity and creativity assessments. The basis for creativity assessments is the cognitive concept of divergent thinking. Torrance defined divergent thinking as being characterized by four components of ideas, which he termed mental characteristics. These four idea components include fluency, flexibility, originality and elaboration (Libby, 1984). Torrance developed one of the most valid and reliable assessments of creativity: The Torrance Test of Creative Thinking (TTCT). The TTCT assesses creativity on two dimensions: verbal creativity and figural creativity. In assessing creativity, Torrance defines these two dimensions in terms of mental characteristics. Mental characteristics in verbal creativity involve fluency, flexibility and originality. Mental characteristics in figural creativity involve fluency, originality, elaboration and also abstractness of titles and resistance to premature closure (Cropley, 2000; Segal, 2001).

It is suggested that four criteria be used in an assessment of creativity. One or more of the following must be satisfied for responses to be considered creative. Responses must include novelty and usefulness, reject ideas previously accepted, result from intense motivation and persistence and come from clarification of a problem that was previously vague (Matlin, 1989).

Additional Links (Teacher Motivation and Teacher Job Satisfaction)

Additional studies have confirmed the link between teacher motivation and job satisfaction. A limited number of studies have also reported a link between teacher motivation, teacher job satisfaction and teacher creativity. Pastor and Erlandson (1982) have reported results that show teachers are motivated more by intrinsic rather extrinsic rewards. The results of their survey showed that factors involved in teachers' perceived job satisfaction include expression of creativity, and opportunity for learning. They also concluded that teachers' motivation and job satisfaction are achieved through reaching and affecting students, receiving recognition, and feeling a sense of responsibility (Ellis, 1984). Reiger and Stang (2000) state that teachers' attitudes and creativity are important factors. But these factors must be accompanied by motivational structures.

The concept of teacher motivation and its contribution to student achievement is a positive and productive cycle. Teachers that are highly motivated teach their students to become highly motivated themselves, and so the cycle repeats (Czubaj, 1996). It is reasonable to hypothesize that creating a school environment that facilitates teacher development, fosters independence in teaching for student learning, and fosters a cooperative learning environment will increase teacher job satisfaction, teacher motivation and teacher creativity.

Teacher variables and student achievement

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Studies have examined relationships between teacher characteristics and student performance. Variables include teacher organization (structure indicated by presence/absence of behavioral objectives and organization of outlines given to each student) (Land, 1980), direct verbal behavior of teachers (Chidolue, 1996), positive/negative teacher affect behaviors, teacher personality (Fox & Peck, 1978), goal directed teacher behaviors, (Lawrenze, 1975), motivation, and teacher job satisfaction (Baughman, 1996). No significant relationships have been reported between teacher enthusiasm and student achievement but significant relationships have been observed between teacher structure and student achievement.

Research of relationships between teacher motivation and student achievement has yielded varied results. Nonexistent relationships between these two variables have been reported while in other cases, significant positive relationships have been found between teacher motivation and student performance. In the same cases, higher levels of teacher social interaction were related to higher levels of teacher motivation (Bishay, 1996). These higher levels of teacher motivation could in turn lead to increases in student academic achievement (Bishay, 1996).

Significant relationships have been found between direct verbal behavior of teachers, higher student achievement and more positive student attitude toward teachers (Chidolue, 1996). Examinations of teacher effectiveness and student achievement gains revealed that effective teachers contribute to academic gains regardless of students' individual achievement levels. Relationships also exist between teacher characteristics (eg. self-concept) and student achievement and skill gain (Fox & Peck, 1978). There have been reported relationships between negative teacher affect behaviors and lower student achievement significant relationships between teacher personality and changes in students' achievement over a school year.

Although relationships of selected teacher variables and student achievement varies from grade level to grade level and subject to subject, it is reported that there were no significant relationships between selected teacher variables and student achievement across grade levels and subjects (Rossmiller, 1985). Classrooms that were goal directed have higher academic achievement than classrooms that were not goal directed (Lawrenze, 1975). Selected teacher variables accounted for one-fifth to one-third of the total variability in student achievement scores. Selected teacher variables can be reported as predictors but there are obviously other variables (student and teacher) that are involved in predicting academic achievement in this case and potentially many others (Lawrenze, 1975).

Classroom Structure

If relationships exist between teacher variables and student academic achievement, it is possible that this relationship could interact with other variables, classroom structure for example. It is first important to differentiate between multi-grade grouping and multi-age grouping as the literature examines and refers to both. There are two reasons why the multi model exists. The multi-age model reflects pedagogical philosophy and claims benefits for student achievement as the child remains in the same classroom for at least two years. The multi-grade model relates to administrative consideration and is done out of economic necessity (Naylor, 2000). Sometimes the terms ungraded, nongraded, continuous practice, mixed or multi-age grouping are used interchangeably (Katz, 1992). It should be noted that classroom grouping is not contingent upon any specific educational theory or practice. It refers only to the organizational structure of the classroom (Way, 1980).

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Historically, the multi-graded model was a common form of classroom organization, from the days of the one room schoolhouse until today. One teacher would teach all students in the community, in all grades and the instruction would be altered depending on the age and development of the child. The one room schoolhouse represented 70.8% of all public schools in the United States (Trusty & Beckenstein, 1996). In recent decades, the multi-graded system has shifted from a pedagogical philosophy to an administrative device to cope with declining student enrollment or uneven class sizes (A.H. Hutton, personal communication, June 23, 2001).

Many researchers have commented on the lack of evidence in the area of multi-graded education. The National Education Association reported that there was extensive research that focused on ability grouping, but results had been inconclusive (Rule, 1983). It has been reported that in past decades there was not any conclusive research in the area of multi-graded education and that research in to student achievement still remained to be obtained (Rule, 1983).

Many have complemented multi-grade model for its student benefit. It is suggested that this type of heterogeneous grouping promotes cognitive growth, helps develop social skills, and reduces anti-social behavior because the teacher can have an individualized focus on students' wide ranges of ages and abilities (Russel, Rowe & Hill (1998); Naylor, 2000). Students in lower grades within the multi-grade classroom can benefit from being exposed to the more advanced work, students in higher grades can review previous material and all children can stimulate each other's cognitive development (Veenman, 1995). Other proponents of multi-age grouping argue that the multi-age model provides an atmosphere of individualized learning and helps to increase a child's security because the academic setting is stable for the years that the child remains in the same classroom (Way, 1980).

Academic Research Findings

Numerous investigations lending support to the multi-grade classroom structure have been reported. An investigation showed that students in multi-graded classrooms were doing as well as or better than students in single-graded classrooms in terms of academics (Vincent, 1999). A review of the literature showed that of the sixteen studies that used standardized tests as a measure of achievement, only one showed results that favoured the single-grade classroom structure over the multi-age or nongraded classroom structure (Nye, 1995).

An additional study by through a meta-analysis of research comparing single-graded and nongraded schools in the United States and Canada, found that in only 9% of the studies did the students in multi-grade classrooms perform worse than their single-graded counterparts. The studies that reported higher academic achievement in nongraded schools found superior performance by multi-graded students (Vincent, 1999). Similar results have been reported by other researchers (Veenman, 1995). Also, students in nongraded schools have been shown to have higher academic achievement results when compared to students in graded schools (Vincent, 1999; Veenman, 1995; Hafenstein, 1993).

Research has not always provided support of academic benefit for students in the multi-graded classroom structure. Veenman (1995) reported on a carefully matched study of the achievement effects of multi-grade class assignment on selected areas of academics. Results showed no significant differences between the multi-grade student and the single-grade Students (Rule, 1983). Veenman commented that a potential confound between grade level and ability could have been the reason why no significant achievement differences were found between the multi-grade classes and the single-grade classes. Further that there is no empirical

evidence to support the assumption that student achievement may suffer in multi-grade and multi-age classrooms.

Miller (1991), Nye (1995), Trusty and Beckenstein (1996), and Vincent (1999), have reported on additional academic comparisons between students in single-grade and multi-grade structures. They concluded that there are no significant differences between the two structures. The multi-graded system did not hinder academic performance and therefore supports the multi-graded classroom model as a possible alternative to single-graded organization. Similarly, Way (1980), Russel, Rowe and Hill (1998) found no significant differences and some significant negative differences in different academic areas. It must be noted that in two different years of data collection in the study by Russel, Rowe & Hill, different results were obtained. In the year of different results, negative effects were observed however not significant.

Reviews of achievement differences between students in single-graded and multi-graded classrooms have yielded mixed results. Controlled research in the area of multi-graded education is still in its infancy (Kinsey, 2001). Even with use of standardized tests as measures of academic achievement, results are not conclusive as to which classrooms yield better student academic achievement.

To the Future

Throughout the discussion of teacher variables, there have been links connecting motivation, job satisfaction and creativity. However, investigations assessing relationships between teacher variables and student achievement and investigations comparing single-graded and multi-graded classroom structures have yielded mixed and contradictory results. It is reasonable to hypothesize that relationships may exist between these specific teacher variables and their students' academic achievement. Attempting this research could yield a more accurate result when assessing student academic achievement between single-grade and multi-grade classroom structures.

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