PUPIL DIFFERENCES AND COOPERATIVE LEARNING

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Abstract

In order to understand the relationship between cooperative learning and pupil differences, this paper conducted a review of literature of pupil differences. Then, a review of literature about effects of pupil differences on cooperative learning was conducted. At last, a literature review about research of cooperative learning activities design towards different individuals was conducted.

So far, the research on the effect of pupil differences towards cooperative learning showed two trends. Some literature focused on the benefits brought by heterogeneous grouping, other work had sought to know whether heterogeneous group was more effective than homogeneous group in cooperative learning or not. In the end, there was no evidence showed that whether pupil differences were good or bad for cooperative learning. On all accounts, it was interesting to get a special research result: there were nearly no difference between mixed-sex group members in some perspectives.

No matter how the relationship between pupil differences and cooperative learning, two points can be take into accounted to support cooperative learning. One is to increase the attention to pupil differences. The other is to integrate cooperative learning with other teaching methodologies, for instance, differentiate instruction.

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CHAPTER 1

INTRODUCTION

Cooperative learning is now a popular teaching methodology in the Western world and many other countries. However, the cooperative learning strategy is new to English teachers in China.

Cooperative learning involves varied individuals working together to pursue a common goal. However, teachers have to teach individuals with differences, such as gender, age and ability. The pupil differences are puzzling some teachers because they think it is difficult to adopt a cooperative learning activity to fulfill the need of each student. Meanwhile, some take heterogeneous students as an important element in carrying out cooperative learning. Two questions are asked by teachers: Do pupil differences result in positive or negative influences on using cooperative learning? Do the influences brought by pupil differences have any implication on the design of cooperative learning activities?

Statement of the Problem

The problem to be addressed is “What effects do pupil differences have on the effectiveness of cooperative learning?”

Delimitations of the Research

The research will be conducted through the online Karrmann Library of University of Wisconsin-Platteville and Google for about sixty (60) days. Primary searches will be conducted via the Internet through EBSCO host with ERIC, Wilson Databases, and

PsycINFO as the primary sources. Key search topics included, “pupil differences and cooperative learning”, “student differences”, “learner diversity”, “students with different abilities and cooperative learning”, “multiage and cooperative learning”, “gender and cooperative learning”, and “personality and cooperative learning”.

Method of Approach

At first, a review of literature of pupil differences will be conducted. Then, a review of literature about effects of pupil differences on cooperative learning will be conducted. Finally, a literature review about research of cooperative learning activities designed for different individuals will be conducted. All the findings will be presented in this research.

Definition of Terms

Cooperative learning is a teaching methodology when small groups use a variety of learning activities to improve their understanding of a topic, questions, issues or a subject.

Pupil differences mean students have varied personal backgrounds, such as, gender, age and ability. In 2005, Felder and Brent divided it into three types: “learning styles (characteristic ways of taking in and processing information), approaches to learning (surface, deep, and strategic), and intellectual development levels (attitudes about the nature of knowledge and how it should be acquired and evaluated)” (p. 57).

Linkage to Theory

Social interdependence theory is the basis of cooperative learning. According to

Johnson & Johnson, Deutsch & Johnson say, “Social interdependence exists when individuals share common goals and each individual’s outcomes are affected by the actions of others” (Johnson & Johnson, 1998, para. 8). It is assumed that the type of interdependence structured determines interactions between students, and the style of interaction determines individual achievement, motivation and interpersonal attraction. In this way, it is possible for teachers to apply the theory to daily teaching as to improve instruction and solve problems in using cooperative learning activities.

No specific theory was found to address pupil differences. However, researchers do address the topic, and a review of key ideas is provided in the review of literature.

CHAPTER 2

REVIEW OF RELATED LITERATURE

What are pupil differences?

In China , it is common that a teacher has to face a large class. That is to say, the teacher has to deal with varied students with different backgrounds, such as gender, age, ability, personality etc. Just like it is impossible to find two leaves that share the same appearance, it is inappropriate to reckon that students are the same although they are of the same gender, age and ability. Thus, what is the definition of pupil differences?

Understanding pupil differences is essential to how a teacher teaches and helpful to design objectives and student outcomes. According to Hayden's research in 2006, each student learns in a different way, and the way to recognize the learning differences is to review the following distinct intellectual functions: receptive function, learning and memory function, cognitive and thinking function, expressive function and personality function. It seems that the analysis of intellectual function does not directly describe the meaning of pupil differences. It takes time to understand Hayden's research results, instead, in 2005, Felder and Brent explained the student differences in another way, they thought "Students have different levels of motivation, different attitudes about teaching and learning, and different responses to specific classroom environments and instructional practices" (p. 57). They divided the student differences into three types: "learning styles (characteristic ways of taking in and processing information), approaches to learning (surface, deep, and strategic), and intellectual development levels (attitudes about the nature of knowledge and how it should be acquired and evaluated)" (p.57). Student differences in the research of Felder and Brent were

in the context of learning. Nevertheless, do students only vary when they are learning?

On the first day of teaching, it is impossible to know each student's motivation to learn, ability and learning preference at once. Hence, on the first day, experienced teachers always engage their students in warm-up activities to learn students' names, personalities, interests, beliefs and other background. These positive activities can help the teacher and students develop a closer relationship. Actually, these teachers were collecting different information about each pupil rather than just conducting a warm-up session. Those teachers "know that an individual learner's culture, family background, and socioeconomic level affect his or her learning. The context in which someone grows and develops has an important impact on learning" (Guild, 2008, para. 3).

However, each student has his or her unique characteristics. Some characteristics are merits while some are shortcomings. So many differences turn learning into a complex process for both the student and teacher.

Difference may indicate diversity in some fashion. It includes a wide range of characteristics. If in this way, according to Huitt's article in 1997, pupil differences may include gender, race, family, religion, interests, physical or emotional challenges, skills and abilities, and life experiences. In 2005, Felder and Brent also found, "Diversity in education usually refers to the effects of gender and ethnicity on student performance" (p.57). But according to Huitt (1997), "There are a variety of individual differences that must be of concern to classroom teachers. Some of the most prominent are academic ability, gender, learning style, and ethnicity and culture" (para. 1). Why did Huitt choose to emphasize some of the student differences rather than all of the ones listed? Do the teachers believe that ability,

gender and learning style are the most important diversities among students?

Do Pupil Differences Effect Cooperative Learning?

Today, cooperative learning is no longer a strange jargon to Chinese educators, though some teachers are barely adopting the concept of cooperative learning in their classroom. Cooperative learning focuses on diversities among students. When a teacher is using cooperative learning, he or she should organize heterogeneous groups. This means the teacher intentionally distributes several students with different backgrounds into groups. In this way, it is possible for the members of the group to present varied individual quality, such as results of different academic ability, gender, learning style and intelligence.

It is clear that heterogeneous groups are important to carry out cooperative learning. But the teachers who have large-size classes are puzzled by the numerous types of students. They find it difficult to implement a cooperative learning activity to satisfy all the students. Is it still necessary to assign several types of students to the same group?

So far, the literature on the effect of pupil differences towards cooperative learning indicated two trends. While some literature has focused on the benefits brought by heterogeneous grouping, other research studies have sought to answer the question of whether heterogeneous group is more effective than homogeneous group in cooperative learning.

Much of the research emphasizing benefits of heterogeneous groups has covered the social interdependence theory. Social interdependence theory is the basis of cooperative learning. According to Johnson & Johnson, Deutsch & Johnson say, “Social interdependence

exists when individuals share common goals and each individual's outcomes are affected by the actions of others" (Johnson & Johnson, 1998, para. 8). It is assumed that the type of interdependence determines interactions between students, and the style of interaction determines individual achievement, motivation and interpersonal attraction. How does interdependence function in the specific context of the cooperative learning style of teaching?

Actually, there are two types of social interdependence: positive interdependence and negative interdependence. According to Alberta Canada Department of Education in Edmonton, "Positive interdependence is the perception that group members are connected and need each other in order to be successful in accomplishing a common goal" (1995, p.8). Negative interdependence happens when "the actions of individuals obstruct the achievement of each other's goals" (Johnson & Johnson, 2005, p.287). In a Cooperative Learning activity, if students with different characteristics can create a positive atmosphere that helps each student gain achievements the activity will be more successful. This type of positive interdependence will increase the success of Cooperative Learning activities. Kagan thought positive interdependence was the most critical component of cooperative learning (1992). With the same point of view, Johnson, Johnson, and Smith took positive interdependence as an essential element for successful cooperative learning groups (1998).

In the cooperative activities, students work on the same goal; freely mix with each other without any racial or ability discrimination; share and exchange useful thoughts; build the solution to problems on the basis of their strengths and even weakness; share their experiences with one another to gain knowledge. All these are based on a mutual support, respect for each other and to benefit from each other in a friendly and professional manner

(Millis, 2002). No matter what the differences are, if they can benefit to each other, their differences will not impair the Cooperative Learning instruction. “Group members must perceive they are linked to each other in such a way that one cannot succeed unless everyone succeeds” (Huss, 2006, p.21).

Besides the research on social interdependence theory, the proponents of the Cooperative Learning have proposed the following advantages when using heterogeneous groups in cooperative learning.

First, heterogeneous groups can enhance both male and female students’ achievement. Usually, most people believe that males and females are good at different academic field respectively. For instance, men are supposed to have more intelligence in the field of science while women are more experienced in the arts. Unexpectedly, Petersen, Johnson & Johnson, and Smith disproved this theory by observing heterogeneous grouping from heterogeneous grouping. Their observations were held towards students in heterogeneous groups of gender, ability and original classroom when adopting the Cooperative Learning activities. They found no difference between genders in achievement, though achievement differences did exist among different genders initially. According to their research, “Social interdependence theory predicts that interaction with cooperative learning groups would result in a process of acceptance characterized by equal status of male and female pupils” (Petersen and Johnson & Johnson, 1991, p.717).

Second, successful collaboration in cooperative groups requires students with different learning styles and intelligences to make special contributions to the group task (Webb, Nemer, & Chizhik, 1998). For instance, a discussion on family history needs varied ideas

from different student with different family backgrounds and personal experiences. If all the students in a group share the same background, they may endure similar experiences but not gain information from their outside world in regards to other backgrounds.

Similarly, Huss (2006) made some conclusion from research, "[T]he backgrounds and experiences of all students are important for enriching learning in the classroom. As preparation for life beyond the classroom, it is essential to provide students with opportunities in multiple contexts to understand and interact with diverse perspectives" (p.20).

Third, gifted students can gain self-esteem by interacting with mixed ability groups (Melser, 1999). Adams-Byers, Whitsell and Moon (2004) had a study on "student perceptions of differences in academic and social effects" which "occur when gifted and talented youth are grouped homogeneously (i.e., in special classes for gifted students) as contrasted with heterogeneously" (p.7). They found that a few of the participants prefer heterogeneous classes to homogeneous classes, because heterogeneously grouped learning enables gifted students to reach at high class ranking with little work. Melser and Adams-Byers both detected the improvement of confidence in gifted students. However, it might not be a positive influence to the confidence of lower-ability students.

Lastly, Baer (2003) concluded from his research that heterogeneous groups made it possible to "promote nonacademic goals of cooperative learning, such as improving intergroup relations, while grouping students in ways most likely to result in the highest levels of student achievement" (p. 173).

Nevertheless, some researchers were skeptical about the efficiency of heterogeneous group. At first, not every group member reached the same learning goals. In other words,

achievements differed among members who have varied abilities, gender and personalities in heterogeneous groups. In 1982, Webb found differences among students in the view of students' ability, gender and personality. In detail, "medium-ability students in uniform-ability groups achieved more and received more explanations than in mixed-ability groups" (Webb, 1982, p.642); males gained greater achievement than females; introverted students outperformed extroverted students while extroverted students were more likely to receive answers to questions(Webb, 1982).

Second, lower ability students may hinder the performance of higher-ability students (Hill, 1982). It is possible that lower-achievement learners limit the development of higher ones. Because of the lower level of medium and low ability students, high-ability group members sometimes spend more time on helping medium and low ability students than working on their problems. In addition, the lower-level students with limited achievement provide fewer solutions to problems.

Third, the low-ability students become "listeners" of higher-ability students. That is to say, the low-ability students are simply told the answers by higher ability students, and they do not learn how to accomplish the work on their own (Salvin, 1984).Thereby, low-ability students cannot improve as much through the cooperative learning environment.

Fourth, as Baer wrote, "Homogeneous grouping could result in significant achievement gains, at least among average and high achieving students, while doing no harm to the achievement of low-achieving students"(2003, p.173). Thus, does it mean that homogeneous and heterogeneous grouping makes no difference?

Among the advantages and disadvantages of heterogeneous groups mentioned above,

some educators and researchers appreciate and encourage mixed groups while some think that “[c]ooperative learning will flounder because some large number of students will be disadvantaged and another potentially valuable educational innovation will join the list of failed panaceas” (Genovese, 2005, p.575). There is no conclusive evidence that shows whether pupil differences are good or bad for cooperative learning.

On all accounts, it was interesting to get a special research result from Petersen in 1991. We concluded that there was nearly no difference between mixed-sex group members in achievement, verbal participation in the group, perceived leadership, and status in cooperative learning. Moreover, “[t]he results are consistent with the proposition that group composition in terms of sex is not a significant influence on the outcomes of cooperative efforts” (Petersen, 1991, p.733).

Implications to design cooperative learning activities

Through the review of pupil differences and cooperative learning, it comes into focus that the heterogeneous students effect cooperative learning in both positive and negative way. After all, both the proponents and opponents of heterogeneous groups have looked into teaching strategies to make up the shortcomings of differences in students.

In 1995, a book named *Teaching for student differences* had an insight into strategies to pupil differences. It presented and classified the strategies into four types: generic strategies; organizational and instructional strategies; general adaptations and adaptive techniques; strategies by categories of differences. No matter how the types varied, “[f]lexibility is the key to providing instruction which maximizes opportunities for all students to learn” (p. 12).

Specifically speaking, vary instructional time, environment, resources, materials presentation, assignments and the nature of instruction. (Alberta Dept. of Education in Edmonton, 1995)

Moreover, according to the individual experience of Kathleen Fulginiti, the same materials may vary usages-change the same materials into varied objectives and expectations for each level of learners. For example, gifted learners "might invent their own questions on the back and trade them around" (Arnette, T., et al, 2003, p.44). At the same time, lower level learners might work with friends and classmates to complete the tasks. (Arnette, T., et al, 2003)

With the rise of gifted education, Huss (2006) found that "gifted youngsters need to individually progress at a faster pace even if the curriculum has been modified to emphasize density and complexity" (p.23). In other words, sometimes, high-ability students need rather difficult problems and need to finish them on their own. In addition, Huss (2006) indicated that adopting heterogeneous and homogeneous groups works to keep balance in the learning environment. Does the strategy work for students at a lower academic level?

Likewise, in 1999, Melser's study on gifted education strategies supports the combination of homogeneous and heterogeneous groups in cooperative learning. Melser wrote, "The use of flexible grouping or changing groups may be an important key for using cooperative learning…" (p.315). As Melser suggested in 1999, in an accelerated reading program, the teacher might choose homogeneous groups as to insure the uniform-ability students improve together. Then, "the teacher may have heterogeneous groups for students who are working on a new concept or completing a non-academic activity" (p.315).

In 2000, Schniedewind and Davidson described some techniques in their article called

“Differentiating cooperative learning”. They deemed that the typical cooperative learning strategy encourages teachers to teach to the middle but not the academic needs of both high and low-ability students thoughtfully. Schniedewind and Davidson thought, when teachers bring cooperative learning into practices, teachers “can personalize students learning, help students collaborate while challenging each individual in the context of a group effort, and encourage students to appreciate their peers’ diverse competencies and experiences” (p. 24).

How do you deal with a wide range of abilities in one class? In 2003, some educators answered the question--in order to strike a balance on students’ abilities, organize teams of four students made up of one high-ability, one low-ability, and two medium-ability students. Thus, when students work together to solve a problem, each member of the team includes the lower ability student, takes turns to discuss and give the solution. Every group member has the responsibility and opportunity to enjoy the rewards and improvements of Cooperative Learning (Arnette, T., et al, 2003).

Most of the strategies are conducive to the variety of different academic ability, while some focus on gifted education in cooperative learning. If the teaching skills toward gifted students can be of use in designing cooperative activities for normal students, it might be an inspiration to work out the relationship between pupil differences and cooperative learning.

CHAPTER 3

CONCLUSIONS AND RECOMMENDATIONS

Recapping to the previous chapters, it appears obvious that most of the research in the literature review was published after 2000. From the date of the research, it indicates that the more developed the cooperative learning teaching, the more the focus is on pupil differences within cooperative learning activities. Although the relationship between pupil differences and cooperative learning cannot be proven, they are indeed related to each other in both positive and negative ways.

Pupil differences, also called learner diversity, assemble the different gender, race, personality, abilities, and many other students' perspectives into a classroom will enrich the class. If we put the pupil differences into a cooperative learning environment, they become important elements of cooperative learning teaching. That is to say, heterogeneous grouping brings up benefits to cooperative learning: improvement of student from each level; self-esteem boosting for high-level students and promotion of inter-group relations.

Even though heterogeneous groups have some positive effects on the Cooperative Learning, they also cause concerns. As far as the problems are concerned, some considerations were listed by some researchers:

Firstly, low, medium and high ability learners achieve differently, though they improve together. Certainly, the varying of teaching time, environment, and resources can be a way to differentiate cooperative learning. Give each individual students comfortable time, environment and resources in teaching to ensure and strengthen their achievement.

In addition, some educators found that lower-ability students might impair high-ability students. To avoid such a case, schools should provide more opportunities for high-ability students to finish more challenging tasks, thus encouraging the performance of high-ability students.

Another research study indicated that the low-ability student is a knowledge “receiver” rather than a “sender”, and they cannot complete the study by themselves. In order to keep balance of each level, the most appropriate group should consist of one high-ability, one low-ability and two medium-ability students. In this way, with less pressure from authority (high-ability student) in one group, the low-ability students interact more, and then gain more knowledge. However, except for the differences on academic abilities, teachers should also learn to organize other pupil differences to help students gain positive interdependences.

Unexpectedly, the comparison between homogeneous and heterogeneous grouping even showed similar efficiency in cooperative learning. How about using both heterogeneous and homogeneous groups? Personally speaking, adopting heterogeneous and homogeneous groups together is a fashionable grouping method that might strengthen the merits while reducing the shortcomings of the two groupings.

In the literature review, every strategy was proposed to solve only one problem. Up until now, there was no specific technique to fit every situation in cooperative learning instruction, nor general idea in designing cooperative learning activities for different students. Of course, it is impossible for teachers to uniform their varied students in order to boost the Cooperative Learning instruction. What are necessary to be updated on groupings in cooperative learning? Anyway, there are two tentative plans:

For one thing, increase teachers' understanding of the importance of pupil differences. Only if the teachers sense the importance and effect of pupil differences, then they may have more focus when designing and adopting cooperative learning. Thus, the teachers become more and more experienced on the importance of pupil differences.

Another suggestion is to integrate cooperative learning with other teaching methodologies to create some variation. For instance, use varied grouping methods. The purpose of each teaching methodology is to help students grasp knowledge. As long as the purpose does not change, the appropriate combination of each method makes sense.

Finally, some high-technique equipments might be used to support the cooperative learning activities. For instance, computers, a fashionable multimedia can present visual and audio resources to attract students. It is a way to engage students with different intelligences.

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