

Using 'Jigsaw II' in Teacher Education Programmes

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Abstract

Most in-service teachers find curriculum modules difficult to understand when they are studying for a part-time degree in education. In teaching in-service teachers about curriculum, the author first encountered difficulty in catering for their different needs arising from their diversified backgrounds. The condition gradually improved when cooperative learning was used as the main teaching strategy. In this paper, the author attempts to share his experience of using Jigsaw II to teach in-service teachers. The successful implementation of Jigsaw II is discussed, including skilful handling of participants' requests, clearing their misunderstanding of the concept of Jigsaw II, and allowing time for the participants to appreciate the beauty of Jigsaw II.

BACKGROUND

Education in Hong Kong is undergoing a fundamental reform that has sparked off a series of changes at various levels: system, school and classroom. One of the notable changes relates to teachers' professional development. Teachers are expected to act as curriculum change agents and leaders in school to develop a school-based curriculum that aligns with the new curriculum framework. A variety of measures are taken to support teacher development, such as the provision of curriculum resources and school-based support for curriculum development and creating time and space for teachers (Curriculum Development Council, 2001). These measures are vital to the successful implementation of the curriculum change, and are particularly helpful to those teachers who have not taken curriculum studies in their teacher training.

As a major teacher education provider, the Hong Kong Institute of Education is proactive in its

programme development and has been offering core modules in curriculum studies since 1994. However, the teaching of curriculum has met with some difficulties. First, student teachers often find curriculum studies a remote subject, especially compared with their major subject. Unlike the major subject, which is a continuation of one of the academic subjects in their secondary education, the subject content of curriculum studies is often perceived as new and hence unfamiliar. Second, it is difficult for student teachers to relate the content of curriculum studies to their own experience, and hence asking them to construct knowledge based on their personal experience is not easy.

The scenario discussed above becomes more complicated when we teach curriculum to another group of student teachers - namely the in-service teachers (hereafter called the participants). These participants are serving teachers who have got a qualified teacher status.

They are taking mixed-mode programmes to upgrade their professional qualification to the bachelor's degree level. Though they all hold a Certificate in Education or Teacher's Certificate, they differ in their teaching experience. It is not surprising to find both novice and veteran teachers in the same class. Unlike the pre-service student teachers, these participants have certain understanding of the concept of curriculum. They know what the school curriculum is, but may not understand how it came about or why a certain kind of curriculum is adopted. The curriculum modules therefore aim to equip them with the necessary skills and knowledge to reflect on their practice, and to evaluate and design a curriculum that suits their school context.

Various methods have been used to teach the participants who are diverse in ability, learning style and teaching experience. These methods include lecturing, individual and group presentation, as well as discussion in pairs, small groups and with the whole class. The discussion method appeals to the majority of the participants as they have something to share and learn from each other. However, a major drawback of the method is that it creates an opportunity for some participants to become "free riders", especially when the discussion is held in small groups. These free riders share the group outcome, but contribute little to the group. This brings harm not only to the group collegiality, but also to the free riders themselves. For the free riders, the gain is minimal, and they end up losing interest in the module. Indeed, the productivity of the group does not reflect the group size, since "the sum of the whole is less than the potential of the individual members" (Johnson & Johnson, 1999, p.71). As a result, the group becomes a pseudo-learning group in which "the interaction among group members detracts from individual learning without delivering any benefit" (Johnson & Johnson, 1999, p.71).

SHARING AN EFFECTIVE TEACHING STRATEGY

Apart from sharing with the readers a new teaching strategy, the paper aims to fulfill two objectives: (1) to explore the usefulness of Jigsaw II in in-service teacher education programmes; and (2) to find out ways to enhance the effectiveness of Jigsaw II.

Cooperative learning is the instructional practice in which students help each other to learn in small groups towards a common goal (Johnson and Johnson, 1999). Much research has been done over the past thirty years on the use of cooperative learning across age groups, ability levels and cultural backgrounds. The results generally suggest that cooperative learning develops higher-order thinking skills (Mathews et. al, 1995), enhances motivation, improves interpersonal relations (Nastasi & Clements, 1991) and peer relations (Slavin, 1985). Most important, it exploits the diversified abilities of pupils to enhance their cognitive and social performance.

Various cooperative learning methods have been developed over the years and put into practice in the classroom. Some of the most extensively researched and widely used methods include Student Teams-Achievement Divisions (STAD), Teams-Games-Tournaments (TGT), Jigsaw II, Team Accelerated Instruction (TAI) and Cooperative Integrated Reading and Composition (CIRC) (Slavin, 1995). Each of these methods has its own characteristics and relevance to different curriculum areas and students in different key stages of learning. For example, while STAD, TGT and Jigsaw II can be adapted for use across most subjects and grade levels, TAI is specifically designed for mathematics in Grade 3-6 and CIRC for reading and writing instruction in Grade 2-8. There are some other popular cooperative learning methods, which include

Group Investigation, Learning Together, Complex Instruction and Structured Dyadic Methods.

Jigsaw II

The cooperative learning method that I have used to teach curriculum to the participants is Jigsaw II, which was developed by Robert Slavin, having adapted Elliot Aronson's Jigsaw technique. The implementation of Jigsaw II comprises five steps: (1) reading; (2) expert group discussion; (3) home group reporting; (4) testing; and (5) group recognition. I will give a brief overview of its implementation, followed by an elaboration with examples.

Overview

First, the materials to be read and learnt are divided into four parts with guiding questions. Each pupil in a group is asked to focus on reading one part of the materials. Upon finishing the reading, pupils from different groups who have read the same part of the materials form an expert group to discuss the materials. After the discussion, the group members go back to their home group reporting what they have discussed in the expert group. After listening to each "expert" in the group, all group members become familiarized with all the four parts of the materials. At the end, testing is performed on individual members to compare their performance. Each group member takes an individual quiz and the score is compared with the base score to calculate the individual improvement score, based on which a group average score is worked out. The group with the highest average group improvement score is given group recognition by getting a group reward. Alternatively, any group which has its average group improvement score reaching a pre-determined level can receive a group reward.

Reading

Take teaching the topic on models of curriculum design for a 3-hour session as an example. Each participant is given an identical set of materials relevant to the topic, as well as an expert sheet. For groups of four, the expert sheet consists of four questions, each of which focuses on one of the four themes of the reading materials. Every member of the group is responsible for finding answers to one of the questions in the expert sheet from reading the relevant part of the materials. The questions in the expert sheet shown below can be randomly assigned to the group members.

1. What are the features and limitations of Tyler's model?
2. What are the features and limitations of Wheeler's model?
3. What are the features and limitations of Walker's model?
4. What are the features and limitations of Skilbeck's model?

Each participant reads the relevant materials for half an hour. Alternatively, the reading of the materials can be done as homework before the class to save the lesson time, especially when the materials are lengthy.

Expert group discussion

Participants working on the same question in the expert sheet form an expert group. Four expert groups are thus formed. In order to facilitate the discussion, some guiding questions can be set for each expert group. Each member is encouraged to take notes of what they have discussed so that they can teach their members in their home group after the expert group discussion. Whenever a problem arises, the participants should try to handle it by themselves before seeking help from the teacher. Conflicts should be resolved using appropriate social

skills. Depending on the type of questions, group consensus may not be necessary. This step can also take half an hour.

Home group reporting

Participants in the expert groups go back to their original home group to teach others the things they have discussed. They are reminded to help each other to master the materials as much as possible. After each member has shared his/her expert knowledge with each other, it is useful for the teacher to conduct a short whole class discussion. The purpose of the class discussion is for clearing doubts, if any, as well as for provoking further discussion of the topic. This step may take an hour to one and a half hours to complete.

Testing

Members of each group take an individual short test after mastering the reading materials. Usually, the test items are in the form of multiple-choice questions. Immediately after the test, members exchange their test papers to mark the answers. The individual test scores are then computed as improvement scores by comparing with the base scores that represent students' past performance. This step takes about half an hour to complete.

Group recognition

If the average group improvement score (calculated by adding the total improvement scores of the members of the group and dividing it by the number of members) reaches a predetermined level, each member of the group will be awarded a group reward. The reward may take the form of a certificate or other forms that the group

members treasure. Each member of the group gets the same reward, irrespective of their individual performance in the test. The purpose is to strengthen their cooperation. This final step takes 10 minutes to finish.

Success of Jigsaw II

In the design of Jigsaw II, Slavin has constructed in it four elements which contribute to its success: (1) mixed-ability grouping, (2) individual accountability, (3) group reward; and (4) equal opportunity to success. These four elements will be discussed below with reference to my experience with the participants.

Mixed-ability grouping

In my class, the participants were carefully assigned to heterogeneous groups in terms of ability, gender and teaching experience, so that each group was a cross-sectional representation of the whole class. Research shows that the performance of low ability students improves in heterogeneous grouping (Webb & Cullian, 1983) because these students receive more elaborated explanations from their high ability peers about the learning materials (Webb, 1992). In the case of high ability students, research shows inconsistent results for their learning outcome. Some research suggests that there is no regression among high ability students (Hooper et. al, 1989); others show that they perform as well in heterogeneous as in homogeneous groups (Nastasi & Clements, 1991; Hooper & Hannafin, 1988). Webb (1992) argues that high ability students learn more in heterogeneous than in homogeneous groups because when giving elaborated explanations to the low ability peers, they reorganize and clarify information in different ways, which enhances the development of their meta-cognition.

Sometimes, the composition of the group has to be revised slightly to smoothen the implementation. On one occasion, after I had carefully allocated the participants to groups, I noticed a male participant in a group showed no interest to participate in the discussion. I talked with him during the break and found out that he preferred to join his neighbour group in which he had friends of close working relations. He said:

I know the merits of learning in a mixed-ability group. I am also using it with my pupils. They seem willing to join the groups that I allocate them to. But as an adult learner, I prefer to work with someone I know.

I accepted his request and noticed that in the new group, his performance measured up to his potential.

Individual accountability

Individual accountability means that the success of a group depends on the individual learning of all the group members (Johnson & Johnson, 1989; Slavin, 1995). Apart from responsibility for one's own learning, each member has to be responsible for facilitating the learning of the rest of the group. Individual accountability exists when the performance of each individual member is assessed, the results are given back to the individual and the group to compare against a standard of performance, and the member is held responsible by groupmates for contributing his or her fair share to the group's success (Johnson & Johnson, 1999). As such, individual accountability motivates the group members to help one another to exert maximum effort in the learning process (Slavin, 1995).

My experience with the participants revealed that it could be difficult for them to accept the concept of individual accountability. Three participants told me that they could not convince themselves that they should be

held responsible for the learning of their group members. They insisted that learning was a personal thing and a person should get what he had paid for. One of the participants remarked:

It sounds strange to me that one has to be held accountable for others' learning. If a person does not want to learn, he should bear the consequence, but not the members of his group.

Another participant reiterated:

It's already very good if everyone can be responsible for their own learning. It will be difficult, if not impossible, to go further to ask them to be responsible for each other's learning.

I respected their views and let each of them form a 'one-man group'. They read the whole set of materials and were responsible for their own learning. After four weeks, one of them changed his mind and asked me to let him join one of the groups.

Group reward

Individual accountability can be fostered by the effective use of group reward based on individual performance (Slavin, 1987). As members know that for each to get a group reward, the performance of the group, which is determined by the sum of each member's improvement score, must reach an expected level. This extrinsic reward motivates them to learn hard for themselves, as well as to help each other to learn well. With other things being equal, group reward and individual accountability enhance the achievement outcomes of cooperative learning (Slavin, 1995).

At first, the participants in my class were interested in receiving a group reward as recognition of their cooperative effort. I gave each member a certificate that I designed. After several times, they were not interested

in the group reward, though I attempted to change the form of the reward each time. Nevertheless, they still made effort to learn hard for themselves and to help each other to learn. They told me that they were intrinsically motivated as they had really learnt something and experienced enjoyment in the process of learning.

One of the participants commented:

Experiencing success in learning itself is an effective reinforcer. I don't think I need any extrinsic reward unless it is very attractive, like a scholarship or a free trip overseas.

Equal opportunity to success

Jigsaw II uses improvement scores instead of test scores for computing the group score. If test scores are used, members of low ability will be perceived as a burden to the group as it is impossible for them to get as high test scores as those of brighter members. It is unlikely that they will see themselves giving as much contribution to the group as other members. With improvement scores, members of different ability are given an equal opportunity to earn points towards the group score so long as they make improvement over their past performance, irrespective of their actual score. The only rival is the self while the other members of the group are friends.

Two of the participants sent me an email saying that they thought it was unfair that their performance could be influenced by other members of their group. One of them wrote:

No one wants a member of low ability in their group as the group score will be dragged down.

It is evident that the participants do not understand that each member can contribute as much to the group as the other, irrespective of their ability. I explained to them that the influence could be positive and negative.

Sometimes, the group got a good score mainly because of the improvement made by the other members of the group. Moreover, this kind of assessment is formative and could only help them learn better. In no circumstances would the group score be counted towards the summative assessment of individual participant.

CONCLUSION

Various overseas studies have suggested that Jigsaw II as a method of cooperative learning can be effectively used across most subjects and grade levels. It not only enhances the motivation and performance of students, but also develops their social skills for group work. From my experience, Jigsaw II can also be successfully employed to teach curriculum studies, a brand new subject, to the local in-service teachers of diversified backgrounds. Nevertheless, the tutor has to be cautious in handling individual participants' needs and interest. It is suggested that the tutor should exercise a certain degree of flexibility in structuring heterogeneous groups so that the members can learn from each other in a collegial atmosphere. Learning in cooperative groups may not appeal to every learner. If an adult learner prefers to learn alone, there is no reason why he/she should be forced to learn in a group, unless his/her mindset of learning has been changed. It is suggested that before cooperative learning is employed in the classroom, the tutor should conduct some problem-solving activities with the participants that require a different mindset so that they will be less resistant to the idea of cooperative learning.

To conclude, for successful implementation of Jigsaw II, the tutor has to handle the participants' requests skilfully (e.g. grouping) and make sure that participants have a clear understanding of each step of the method. Finally, the tutor has to allow time for the participants to appreciate the concept of learning together.

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