Transforming the Teaching Belief of In-service Teacher from Teacher-centered to Student-centered through Knowledge Building

Yujie Chen, Yibing Zhang
School of Education and Science, Nanjing Normal University, No.122, Ninghai Road, Nanjing City, China
ellie29800@126.com, zhyb304@126.com

Abstract: A large number of teachers in China still use traditional lecture-style teaching method in a whole class which is totally teacher-centered and can't completely meet the needs of innovative society, even for the novice teachers who have been just graduated from universities. In order to change this situation effectively and further improve their attitudes toward instructional design, this research try to use Knowledge Building pedagogy to organize a teachers' training program in two design cycles (7 weeks, part time) which are theoretical building cycle and practical building cycle. Participants include 45 in-service vocational school novice teachers in different subjects. Data analysis include: (1) qualitative analysis of teachers' pre-post reflection sheets; (2) the content analysis of teachers' notes on Shuke; and (3) quantitative analysis of teachers' initial and ultimate instructional design cases. Findings suggested that KB can make teachers aware of the importance of the student-centered teaching belief; and after KB their attitudes toward instructional design become much more active and positive.

Introduction

Teacher training is important and highly valued all over the world, especially education reform is blooming recently in China, which highly stressed the importance of teacher training. And the inexperienced teachers are easy to make changes in teaching methods and teaching beliefs, they are actually quick learners, which means that the inexperienced teachers has much potential than veteran teachers to some degree. So in this research, we conducted a teacher training program in Nanjing, which actually has lasted for about 3 years, and is widely distributed in variety of vocational schools. The training include the instructional design, vocational education theory, moral education of teachers, etc.

However, in this program, lecturing is the main method to train teachers, which didn't receive satisfying effects as we expected. For example, an interview about teachers' attitude towards instructional design was conducted with several teachers randomly, and found out that they do not pay much attention to it. Take one math teacher as an example, she mentioned that there are something much important than instructional design, like courseware… What is more, teachers' instructional design documents indicated that they preferred traditional lecture method, which was totally teacher-centered regardless of students.

So to sum up, there are several problems need to be solved. First is about old way of teacher training is a stereotype; and novice teachers have wrong attitudes toward instructional design; last is about their instructional designs are all alike and their teaching belief is teacher-centered. So according to all the problems, changes and innovations are needed.

Many researches indicated the traditional lecture style teaching is not very effective, which was first provided by Dr. Donald Bligh in the 1980s and 1990s. And subsequent work by a variety of authors also has empirically confirmed that lectures were not the best practice for achieving a variety of important educational outcomes (McCarthy and Anderson, 2000;Niemi, 2002; Armbruster et al, 2009). So all these researches indicated that lecturing can not meet the need of innovative society and also teachers can not gain much knowledge. Carl once said that teaching has been viewed as a craft. (Bereiter, 2002), so a craft can never be taught well by lecturing or just listening, the teaching methods can be really diversiform, like practicing, designing, creating, learning from others, collaborating with others and so on. So collaborative learning comes into our sight and is proofed the potential among peer learning. For example, Harasim illustrated the principle of collaborative learning addressed the strong socio-affective and cognitive of learning (Harasim, 2000). And Knowledge Building, viewed as a kind of computer supported collaborative learning, is used in teacher training, for example, like fostering teachers' collective reflection (Hong, 2018), and engaging teachers to collectively learn and work with KF about KB theory and

practice(Hong, Chen, et al, 2010). So that's why Knowledge Building is used as an innovative way to help them make changes in teaching methods and teaching methods in this teacher training program.

The research question is whether knowledge building pedagogy would help novice teacher enhance their instructional design competencies, especially help them improve their teaching methods and correct their attitudes toward instructional design?

Methods

Research Context and Participants

An experienced professor who has devoted himself in Knowledge Building for several years is co-designer of this program as well as training teacher. 45 novice teachers who are in 14 different vocational schools and different subject areas with the average age of 26 years old are the research object. Off-line meeting and online meeting (www.91shuke.com) are held every 2 weeks, which has totally lasted for about 3 months.

Figure 1. Knowledge Building among peer teachers

Figure 2. Knowledge Building through KB walls

Research Design

The whole research was conducted with design-based method and was divided into 2 stages. The first stage is theoretical knowledge building and the second stage is theoretical knowledge and instructional design building. So during the two stages' training, teachers' theoretical knowledge and instructional design competencies will be improved step by step.

Different strategies were implemented and adjusted in each week according to teachers' different performance:

Table 1.Different Strategies implemented in each week.

Week 1	Week 2	Week 3	Week 4	Week5	Week 6
Proposed authentic problems and real ideas Read and built others' ideas	Build community rules and temporary groups. Make future plans on KB walls and share	Theoretical knowledge Building in group and in community. Try to think about how to combine theory building with instructional design	Individual theoretical building & instructional design building. Keep on building in group and community. Use individual reflection sheet to reflect on what they have known.		Preparing final presentation of how you design your class.

And the data sources included teachers' instructional design documents before/during/after this training course; their reflection documents; their notes posted on Shuke (www.91shuke.com) , as well as their interview records.

Analysis and Results

And as for the research question Whether knowledge building pedagogy would help novice teacher enhance their instructional design competencies, especially help them improve their teaching methods and correct their attitudes toward instructional design? First all teachers' teaching methods from their initial instructional design

sheets before Knowledge Building were collected and compared with the methods used in their ultimate instructional design after Knowledge Building training. And through the comparison, their changing on teaching methods might be found. And as for their attitudes' changes, some useful data collected from their reflection documents and their notes on Shuke will be analyzed.

Figure 3 is about all teachers' teaching methods applied before Knowledge Building in their instructional design sheets. Figure 4thods applied after Knowledge Building.
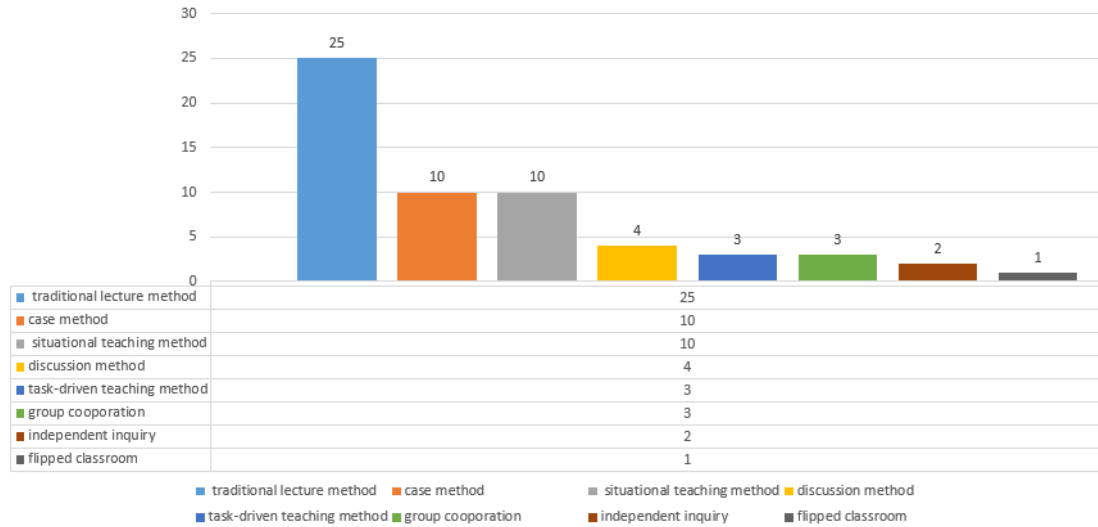

traditional lecture method	25
case method	10
situational teaching method	10
discussion method	4
task-driven teaching method	3
group cooporation	3
independent inquiry	2
flipped classroom	1

traditional lecture method · case method · situational teaching method · discussion method · task-driven teaching method · group cooporation · independent inquiry · flipped classroom

Figure 3. Teaching methods applied before Knowledge Building

traditional teaching method	19
case method	5
situational teaching method	9
discussion method	17
task-driven teaching method	8
group cooperation	14
independent inquiry	8
flipped classroom	1
layered teaching method	1

traditional teaching method · case method · situational teaching method · discussion method · task-driven teaching method · group cooperation · independent inquiry · flipped classroom · layered teaching method
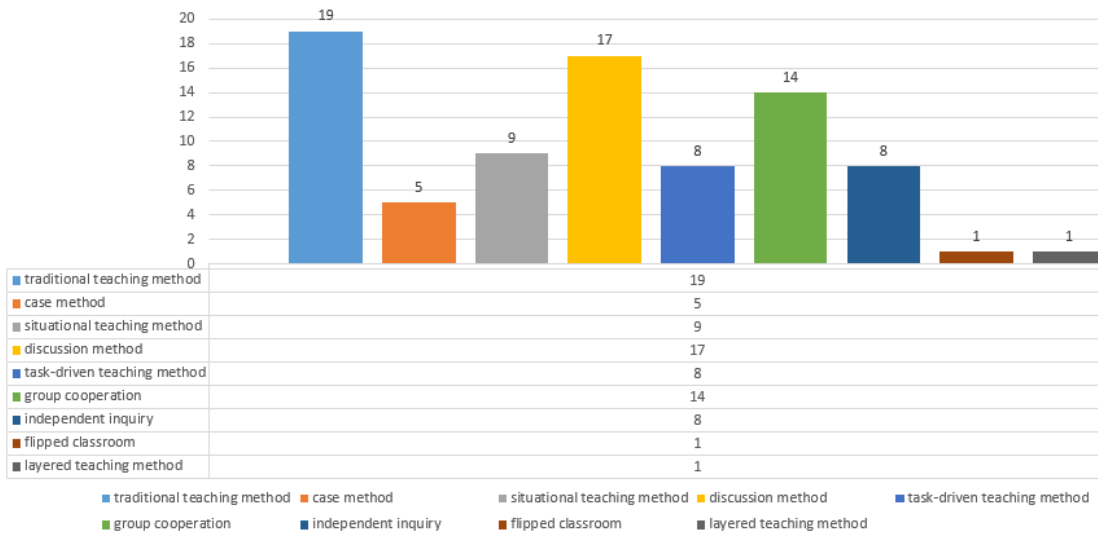
Figure 4. Teaching methods applied after Knowledge Building

Compared these two charts carefully, results are indicated that the types types of teaching methods are almost same before and after the training, but the quantities distribution has changed a lot: first of all, the amount of traditional lecture method decreased significantly; and the amount of discussion method, group cooperation, independent inquiry increased significantly, which indicated the participants were aware of the importance of student-centered.
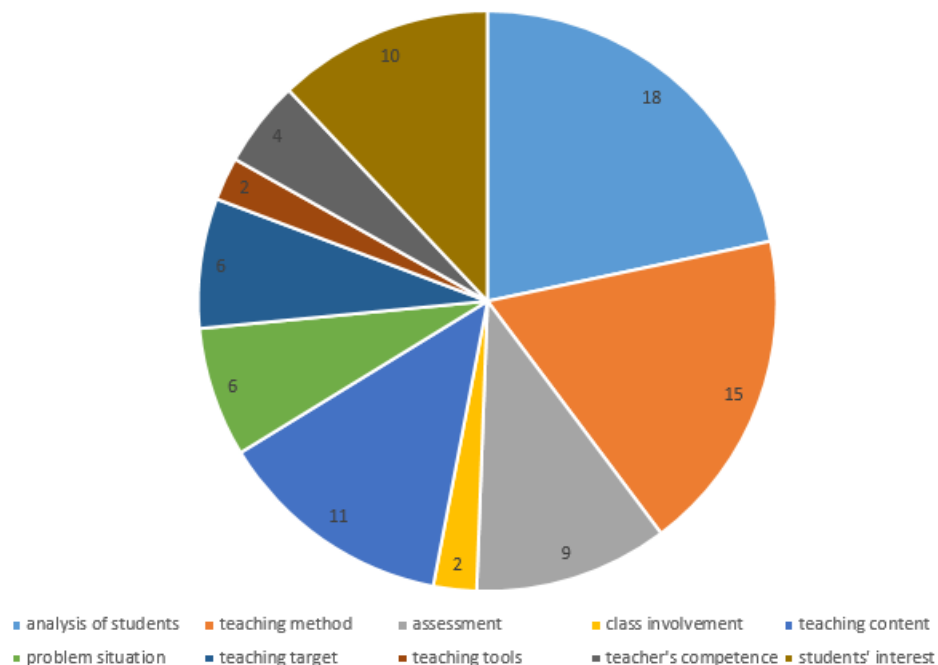
Figure 5. Factors that should be considered in instructional design

And the data in figure 5 is from their reflection documents, which found out the factors that they think should be considered in instructional design. Analysis of students is the most important factor that should be thought in instructional design, which also indicated that they were changing from teacher-centered to student-centered.

As for novice teachers' changing attitudes, content analysis of their notes on Shuke will be done. And a coding scheme revised Henri's 1992 model is used (table 2). So in this model, from phase 1 to phase 5, participants are changing from knowledge sharing to knowledge building, which means the degree of initiative is more and more stronger, and indicated their attitudes' changing.

Table 2. Henri's 1992 model of content analysis as revised by Gundwardena, Lowe and Anderson (1997)

Phase 1	Sharing and comparing
Phase 2	Discovery and exploration of difference
Phase 3	Negotiation of meaning and co-construction of knowledge
Phase 4	Testing and revision of ideas
Phase 5	Awareness of newly constructed knowledge

Here is one of a possible coding example:

Table 3. Possible coding plan

Notes	Possible Coding
Traditional information teaching methods can not be ignored. In fact, even if students are shown some boring video in a class, they will find it much more interesting than having traditional class. The key is how to select teaching materials related to this class.	1. Sharing and comparing
My idea is that the method of using only one instructional design is useful, but sometimes it is hard to control, which may lead to the fact that it can not meet with the basic requirement of a class. In fact, this way for the teacher's teaching ability to inspect a high degree.	2. Discovery and exploration of difference
Although different opinion about portfolio assessment, a better opinion is that comprehensive practice requires new evaluation idea and method. It is opposed to the classification and evaluation of students by quantitative means, and advocates the use of "self-reference" standard to guide students to conduct "self-reflective evaluation" of their various performances in comprehensive practical activities…	3. Negotiation of meaning and co-construction of knowledge

After the mid-term examination, I reranked their scores and made an increasement, which was compared with their scores when they just entered the school. The increase was ranked in descending order, and then the first one who made progress was the first one to choose a seat, and the second one was the second one to choose a seat and so on.	4. Testing and revision of ideas
My conclusion is that as a new teacher, we can imitate some good teacher skills in class, and find new ways, like gestures and controls the whole class.	5. Awareness of newly constructed knowledge

Discussion

So next step, coding will be continued and content analysis for the whole participants will be done to verify the result that their attitudes toward instructional design are going through changes.

And second guessing is the participants are changing their teaching belief from teacher-centered to student-centered, this is truly occurred. But why this transforming can happen and why it can change suddenly? It might because before this training, the participants did not realize that the teaching belief of student-centered is deep inside, in other words, it is a kind of tacit knowledge, and Knowledge Building makes teachers have chance to face their knowledge deep inside and expose it, make the tacit knowledge into explicit knowledge. That might be the reason for the transforming could happened.

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