What impact does teacher training have on the students’ performance?

The effects of a teacher training programme on the students’ outcome

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Abstract

International educational research focuses on the professionalization of teachers. An important question is which competences are needed to be a professional teacher. One of the answers is that teachers’ social-pedagogical competence is an important factor which affects the students’ learning outcome.

A developmental project was launched to shed some light on the relationship between social-pedagogical competences and the adult students’ outcome of teaching programmes. The project was implemented in four Danish institutions that teach adults in the general subjects. The project includes a programme in which teachers are trained to use a specific teaching method: cooperative learning (CL). This method focuses on social interaction among students.

By using the specific method it is assumed that students develop better skills in some areas compared to students taught with traditional adult educational principles.

This study examines the extent to which the training programme for teachers is effective; that is, do teachers develop the ability and willingness to apply the specific method? The results show that teachers are able to apply the method in a reflective way. The results also show that teachers actually use the method.

The study examines the effects of the application of this method on the students. The results show that some effects are evident. The students are first and foremost more willing to cooperate. However, no effects can be documented on a number of other areas, including the perception of the learning environment, the perception of being integrated in the classroom, increased satisfaction with the teaching programme, higher completion rate or better marks.

The results raise a discussion: what kind of teacher training and which adult educator competences can be expected to have a wider positive impact on the students’ outcome?

Introduction

What characterises a professional adult educator? What is professionalism? Which skills should a professional adult educator have?

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These issues have been subject of education policy discussions and acted as an important research question for more than twenty years. In an overview of adult learning programmes in Western Europe professionalisation is said to be the ‘rationale’ behind the interest in adult education (Jarvis & Chadwick, 1991). Likewise, professionalisation is the central theme in the publication Qualifying adult learning professionals in Europe. In the publication it is stated that ‘the professional development and the quality of teachers and trainers have been recognized as a priority in various European policy documents and initiatives in the field of lifelong learning’ (Nuissl & Egetenmeyer, 2008, p. 7).

A comparative study of Asian and European perspectives on adult educators, Teachers and Trainers in Adult Life Long Learning, also highlights the theme of professionalism. As a consequence the following questions are raised: ‘Which Competences do teachers and trainers need in order to provide high-quality educational offers? Which competences will be needed in the Future?’ (Egetenmeyer & Nuissl, 2010, p. 11). In the publication several answers are given to these questions.

The same questions have been addressed by a number of studies over the years. In 1978 a Delphi study of the future need for adult educators’ competences was conducted in the USA and Canada (Rossman & Bunning, 1988 (1978)). The results indicated that ‘knowledge of the psychology of the adult’ was the knowledge that was given the highest priority and communication skills (including listening skills) were the most important skills. A follow-up study reached similar results (Daniel & Rose, 1988 (1982)).

In a recent Delphi study on Core Competences of Adult Learning Facilitators in Europe many of the competences that were also required 30 years earlier in another geographical context were found. The study shows that the ‘ability to create a safe learning atmosphere (not intimidating)’ and, more generally, skills in ‘group management and communication’ are among the most important competences (Bernhardsson & Lattke, 2011).

A Nordic study based on interviews with different adult educational stakeholders found that ‘the ability to implement methods involving the students’ and ‘knowledge of psychology of the adults’ are highly evaluated competences in adult teachers (Marquard & Sørensen, 2011).²

A common and highlighted element in most studies on the requirements for adult professionals’ competences is skills in ‘group management and communication’ and – as a consequence hereof – the ability to ensure an active learning environment. It is therefore a plausible assumption that the development of teachers’ capability to conduct an education programme that places greater emphasis on activities among the students will have a positive effect on the students’ outcome.

These assumptions were examined in a Danish development and research project. It was examined whether the development of teacher competences would have a positive impact on students’ learning

² Several studies on the need for educational competences for adult teachers have been completed in the last 20 years in a Danish context (Bredo & Brinkkjær, 2000; Danneskiold-Samsøe & Ingeberg, 2000; Larson, 1995; Wahlgren, Danneskiold-Samsøe, Hemmingsen, & Larson, 2002; Aarkrog, Andersen, Harrebye, Matzon, & Nielsen, 1997). The general results from these studies are that the need for competences is very complex and depends on the educational context.
outcome. To clarify these matters a project was initiated at four adult education centres. The project included a competence development programme for 31 adult education teachers. The programme aimed to give insight into and skills in using a specific teaching method that activated and engaged the students in interactive processes in a systematic way. In this project the chosen method was cooperative learning (CL). The project included a subsequent analysis of the effects hereof on the students.

The research questions were: How can we train teachers to use a specific teaching method? Will the teachers be willing and able to use the method (cooperative learning) in their classrooms? What competences are needed to successfully apply this method? If teachers have learned and apply a certain teaching method, what influence does it have on the students’ training outcome? The overarching question, however, was this: What impact does teacher training have on the students’ performance?

**The teacher training programme**

In order to judge the efficacy of using a specific teaching method (CL) in adult education, teachers should be able to apply the method successfully. To ensure this it was necessary to further develop their teaching skills. Thus, teachers’ competence development formed a core component of the project. The crucial question was: What form should the teachers’ competence development take?

The starting point of this clarification process was that studies of continuing educational programmes have shown that in general there is a limited effect on students’ learning. Continuing education often has only limited transfer; that is, participants apply only parts of what they have learned in the training programme in their daily lives (Lim & Morris, 2006).

Research on transfer reveals a number of barriers to implementing what was learned. One barrier is the temporal distance between learning and application (Lim, 2000). Another is the application context, which includes the workplace conditions and the opportunities these afford for applying what one has learned (Conrad, 2008; Gitonga, 2006; Wahlgren, 2009). The extent and quality of supervisor support in the application context comprise another factor that can enhance or hinder implementation (Kontoghiorghes, 1998, 2001).

Following a systemic review of a number of international studies on teacher training, Rivers (Rivers, 2005) found that a variety of approaches are employed to encourage teachers to improve the quality of their teaching, namely: (1) short courses to train staff in discrete skills, (2) in situ training for developing complex knowledge, attitudes and skills, (3) consulting, peer assessment and mentoring, (4) student assessment of teaching and (5) comprehensive development programmes. His analysis of all the results indicates that a short, skills-based course alone is unlikely to produce significant changes. What does produce more lasting effects is a greater emphasis on helping working groups reflect collectively on their joint tasks. Other literature review confirms this (Larsen & Wahlgren, 2010; Wahlgren & Larsen, 2009).
In another study, the authors noted that ‘[r]esearch indicates that professional development programmes were accorded higher ratings when sustained and intensive – rather than short term, “one shoot” workshops. The programmes tend to be more efficient when they provide teachers with opportunities for hands-on, active learning, and when they entail collaborative and collegial learning environments’ (Torff & Byrnes, 2011, p. 27).

Continuing education in the form of a short stand-alone course, where implementation is left to the individual participant, would therefore not be expected to have a lasting impact. Instead, in order to ensure the qualified and skilful use of the CL method, the training process was structured in a fundamentally different way. It was organised as an interaction between practice and reflection on this practice. Extensive coaching was also included, which has proved effective in the implementation of learned skills (Batt, 2010; Stelter, 2004).

In accordance with these considerations a teacher training programme was planned and implemented. The competence development of the teachers in the project included:

1. An introduction to the method and the theories of CL (by way of a prescribed text³)
2. A two-day course of practical exercises
3. Group coaching seven times throughout the study period

The purpose of coaching the teachers was to facilitate continual improvement of their use of CL in the classroom. Coaching sessions were designed in order for the teachers to reflect on the way they used CL and on the problems they encountered in implementing it in their teaching.⁴

**The teaching method: cooperative learning**

Cooperative learning can be defined as a teaching method based on systematic and planned use of small groups that enables students to work together to improve their own and each other’s learning (Kagan, 1994).

The approaches of Kagan and Slavin (Slavin, 1995) can be characterised as a method based on well-defined procedures for group activities, or ‘structures’. Within these structures, teachers play a supportive role in the students’ learning. The teaching method used by the teachers in this study follows these principles.

The theory behind cooperative learning is that students actively acquire their knowledge through interaction with other students, rather than through passive acquisition from ‘teacher-talk’

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³ Undervisning med samarbejdsstrukturer (Teaching with cooperative structures) (Kagan & Stenlev, 2006).

⁴ The training programme and the outcome of the training are described in more detail in *Training of Adult Education Teachers – Experiences from a teacher training program in cooperative learning* (Wahlgren, 2011).
Organised, directed group work generates learning situations in which students are supposed to work together to achieve shared learning goals. The cooperative learning groups are expected to provide social support to the group members, and this support is supposed to improve the learning process. The learning environment must be supportive and free from anxiety. Adults working in a competitive atmosphere are more anxious than in a cooperative one. The goal of a cooperative learning environment is to establish a climate in which it is possible to benefit from mistakes, as opposed to a climate in which mistakes must be hidden in order to avoid ridicule.

Many studies indicate that cooperative learning practices lead to higher academic achievements, increased productivity, more efficient processing and exchange of information, positive relationships among students and greater development of trust, social support and class cohesion than do competitive and/or individualistic learning situations (Ghaith, 2003; Johnson, Johnson, & Smith, 1991; Wheelan & Lisk, 2000). Other studies have discovered an improvement in the students’ interpersonal relations and communication skills (Ballantine & McCourt, 2009; Peterson & Miller, 2004).

A study investigating the academic effectiveness of cooperative study groups that were designed to help first-year trainee teachers prepare for tests in an introductory psychology course revealed no significant differences in their average test scores (Kennett, Young, & Berrill, 1999). A quasi-experimental study involving 213 students stated that students in the traditional method groups trusted and communicated with their peers more; they also displayed greater feelings of togetherness compared to the cooperative learning groups. However, the subjective data pointed to one positive effect of cooperative learning: several students reported, in open-ended questions, that their social relations with group members had improved in the cooperative learning environment (Kadir, et al., 2005).

Finally, an investigation into students’ values found that students appreciated anything they perceived as improving their exam performances. They ascribed equally high value to lectures and to being individually active. Working with others was perceived as less valuable (Machemer & Crawford, 2007).

The general impression from the huge number of studies on the effect of CL is that the method has an impact on the student. The method seems to improve both the student’s social and communicative ability and – as shown in some studies – his or her academic achievement. Some studies do not find such correlations.
**Research problems and questions**

The study focused on teachers’ competence development in applying the specific teaching method cooperative learning. The study examined the extent to which teachers’ competences actually developed. And it examined the impact this training had on the students’ outcome.

The first issue that needs to be investigated is the extent to which teachers apply what they have learned in the training programme. The next issue is whether teachers are competent to apply CL. Are teachers able to reflect in a meaningful and productive way on their application of the method? The third issue that needs to be investigated is whether the performance of adult students who were taught via the specific learning method is superior to that of students who learned through teacher-directed activities combined with interactive learning methods.

The use of CL as a pedagogical method includes, as described above, organised group work that enhances and systematises social interaction in the classroom. Given this, it can be assumed that the use of CL develops the students’ social skills, communication skills and professional learning outcome.

The use of CL in the classroom was expected to have several positive effects, compared with adult education that does not use CL. It was expected that:

- Students’ social and communicative skills, measured by their orientation towards cooperation and interest in their peers, would be improved.
- Students’ satisfaction with the teaching and their social environment would be greater.
- Absenteeism and dropout rates would be reduced.
- The students’ marks would be higher.

**Methodology and data collection**

31 teachers, all experienced in teaching adults, participated in the project. Their areas of specialisation included: Danish, foreign languages, mathematics, science, psychology and religion.

The main *data on the teachers* was collected from competence logs. These were used by the teachers to describe their experiences of CL. They were asked to log how much they used CL and how they justified its use in relation to their teaching aims. Logs needed to be filled out three times during the project, in preparation for the second, fourth and seventh coaching sessions.

The log contained two types of questions:

- Questions about the use of CL, for example: ‘How often do you act differently in your teaching given your knowledge of CL?’
- Questions about students’ reflection on CL, for example: ‘How has using CL provided a significantly better outcome compared to what you expect to achieve with a traditional teaching method? Describe what you normally achieve when you do not use CL.’
Central to this study is the extent to which teachers are competent at using the CL method. We define ‘competent use’ in terms of whether teachers are able to reflect on their implementation of CL (Jarvis, 1995, 2002). Reflection is a core concept in teacher training. The teacher training studies in the last decade ‘centre primarily on reflection as an instrument for change and on the various ways in which reflection can be developed’ (Avalos, 2010). In other words, to improve teaching competences in the appropriate application of cooperative learning it is vitally important to advance teachers’ aptitude for reflecting on their use of CL.

Based on their responses to the questions on reflection, teachers are evaluated on their ability to reflect. The reliability of the reflection assessments was measured by two researchers working independently.

Concerning the students’ outcome the study was conducted as a quasi-experiment. A group of adult students who taught according to the CL method were compared to a control group who used traditional methods in their teaching.

The experiment group (named ‘CL students’) consisted of classes at four adult education centres where students were taught according to the CL method. Each of these classes was matched with classes that were taught according to traditional techniques. These classes constituted the control group. The CL and control classes were matched as far as possible, so that both were at the same level, learned the same subjects and were at the same stage in their education programme.

There were no significant differences between the experiment group and the control group in terms of gender or age variations, but their configuration at syllabus level was notably skewed.

The students – both in the experiment group and the control group – completed an online questionnaire three times during the academic year. The questionnaire contained questions about the students' background and 27 closed and two open-ended questions about their experience and learning outcomes.

Administrative data included dropout rates, attendance figures, pass rates and test scores. This data was collected via official records at the end of the period.

The first questionnaire was answered by 693 students in 48 groups. There was an average response rate of 80 %. The reason why it was not closer to 100 % was partly due to technical problems and partly to fluctuations in student attendance rates.

How much of the teaching in the experiment group was conducted according to CL? In some classes almost all teaching followed the CL method, while other classes only observed this method
to a minor extent. At the two-month point, about one third of the students noted that more than half of the teaching followed CL methods.

As outlined above, the questionnaire contained a number of questions about the students’ teaching preferences and their perceived outcome of the course. The questions about the students’ perception of the teaching and their benefit of the teaching measured the students’ social skills, communication skills and their perception of the teaching.

Administrative data included information on dropout rates, attendance rates, the pass rate and examination scores. Administrative data was collected at the end of the academic year from official records and are thus objective.

**Findings**

**Do teachers use the method competently?**

Teachers were asked: ‘How often do you act differently in your teaching practice after you have acquired knowledge of CL?’ The data shows that teachers started implementing CL two months into the process. The average use does not increase during the academic year.

The vast majority of teachers (more than three quarters) describe teaching situations in which they have benefited from applying the different CL structures. Nearly half of the known CL structures (21 out of 46) are mentioned. Some teachers mention just one structure, while others note several.

Analysis of the first log shows that just over half of the teachers (17 out of 31) demonstrated a high level of reflection regarding the use of CL in their teaching. Just under a third (nine) of the teachers displayed a medium level of reflection, while five were categorised as low or had failed to describe their choices and considerations. It appears that the proportions at each level of reflection are more or less constant.

The teachers had no knowledge of the CL method prior to the process. After the first coaching session, the majority of the teachers were able to apply the method competently and to reflect on their reasons for using CL structures in class. There was no increase in the level of reflection after subsequent coaching sessions.

Teachers generally experienced a higher level of activity among their students when using CL than with other teaching methods. Similarly, they found that the students’ communication skills improved and that social cohesion (in some classes) was strengthened. The method introduces variety to teaching situations. Most teachers found it inspiring to use the new method.
From a teacher perspective alone the project was a success. The teachers were well trained and they were satisfied with the training programme. They use the method (CL) in their teaching and their reflections on the method were in general at a high level. All in all, they were satisfied with the use of the method.

*Does the training programme improve the students’ outcome?*

According to the arguments behind the use of this specific teaching method, we would expect a positive effect on students’ – both subjective and objective – outcome. Do we find such an effect?

Some positive effects were documented

Firstly, we found that the students were satisfied with the new method. They appreciated the variation the method provided. The students experienced that due to the method the outcome of their learning process improved. They felt that they had learned more than they used to.

Secondly, at all three measurement points during the project we found that CL students were more oriented towards cooperation and more prepared to help other students in the group than the students in the control group. Thus, CL seems to develop social competences (measured by co-orientation and the desire to help others) early on in the process.

The students described their experience of teamwork as positive, and they said, among other things, that they learned to ‘talk more’, were more engaged and more confident about expressing themselves and asking their group members for help, when they did not understand the teacher.

There are differences in the effects of CL between the four adult learning centres. At the two institutions which have the most developed culture of cooperation, the effect was greatest. Thus, it appears that the effect of CL is enhanced by an environment that is already open to cooperation.

Thirdly, we found that a greater number of CL students experienced getting positive feedback from fellow students in class compared to control students. More CL students than control students believe that they get a lot out of listening to other group members’ knowledge. These differences are not as extensive as those in the perception of cooperation.

Students found that CL provided a space for them to ask about the things they did not understand, and it enabled them to find common interests with people they would not otherwise have talked to. Fellow students can inspire innovative thinking. ‘You learn more when you talk more’, they noted.

The effects described above do not, however, increase in the course of the academic year.

On many variables no effect could be documented

The teacher training programme and the implementation of the new method were expected to have a number of positive and notable effects on the students’ outcome and performances. The
increased social interaction in the classroom was expected to improve the learning climate. However, the common – and surprising – picture is that we were unable to discover any differences between the CL students and the control group with respect to:

- Experience of teachers' positive feedback
- Experience of their own participation in class
- Experience of working with peers who are both academically stronger and weaker than themselves
- Perception of whether the academic level was appropriate for the class
- Perception of their own linguistic competence
- Satisfaction with being a student in their course
- The social climate in the classroom (social environment)
- The experience of being part of the class community
- Daring to ask questions in class

No significant differences were found between the CL students and the control group at any of the three measuring points of the study. Thus, we can discard the hypothesis that CL improves students’ perception of the teaching they receive, including their level of satisfaction with their education and their social environment.

It has been argued that CL strengthens students’ orientation to cooperation (something that is also documented in this study) and so improves social cohesion. On this basis it is reasonable to assume that CL would contribute to reducing dropout rates and absenteeism. Behind this assumption is the knowledge that socially binding cooperation would, *ceteris paribus*, generate total commitment on the part of the students to the course. In other words, social interaction in the classroom would be intrinsically attractive and motivate students to continue (and complete) their course. It is even expected that the improved communication skills have a positive impact on marks. The results can be summarised as follows:

- The dropout rates are quite similar for the CL students and the control group. A significant positive effect of CL on dropout rates was not found.
- Dropout patterns were very different across the four adult education centres. While there were examples of lower dropout rates in the CL group than in the control group for some primary level classes, there were also examples to the contrary. The same applied to students at secondary level. The figures show a very mixed picture, which depends on the subject, class and culture at the individual adult education centre.
- It is difficult to detect a consistent effect of CL on the level of student absence, and the differences are not statistically significant.
- There is no general, systematic effect of CL on the marks. For oral examinations, there was a (slightly) higher overall average in the CL groups. For written examinations, the level was lower in the CL group.
- CL cannot be said to have a positive effect on the proportion of students that pass their exams. For students at secondary level 90 % of the students from the control group passed their exams compared to 80 % of the CL students.

**Discussion**

The project has provided a method for training adult educators in order to acquire a given pedagogical competence. The actual training programme is highly practice-oriented and based on coaching.

The project demonstrated that teachers have acquired the competence in question. They have learned to use a specific teaching method. They use the method in a substantial part of their teaching time. They are able to apply it in a qualified way, and they are able to reflect on the purpose and the function of the method.

The specific method, cooperative learning, is based on structured social interaction in the classroom. Structured group work enhances students' activity and their communication with other students. Based on theoretical considerations as well as a number of empirical research results teachers' competences and the method could be expected to increase the students' outcome and performance.

The study, however, shows that only a limited effect on the students' performances can be documented. The documented effect is related to an overall positive experience of the variation in education and a more positive perception of student collaboration.

There are no observed effects on a number of other outcomes – outcomes which from an educational viewpoint are regarded to be of major importance: the perception of the learning environment, the perception of the attractiveness of the study, student activity in the school, the dropout rates and the marks.

The specific competences of the teachers and the specific method are not enough to generally improve the quality of the teaching. Teachers gain new skills, but they alone do not change the value the students receive from the education programme. At least not on the first hand as measured in this study.

The explanation is probably that the learning processes, which take place in the actual teaching situations, are all in all very similar. The differences between the teaching conducted by the CL trained teachers compared with traditional teaching in adult education are not marked.

On the basis of the results one can ask what kind of competences the teacher should have to make a difference? Based on the project, it is our assumption that a competence that focuses more broadly on class management, social interaction and the learning environment would improve the overall outcome. That is the reason why the project will continue so as to determine which skills, knowledge and pedagogical approaches could have a greater impact and significance on the students' outcome.
It is noteworthy that both teachers and students are very satisfied with the new method. Both groups think that it has some positive effects. Both groups experience a better social and academic outcome. However, this cannot be proved in the controlled data. So there is a mismatch between the subjectively perceived benefits and the actual measured outcome.

If this finding can be generalised, it means that new approaches and new teaching methods (often) are perceived as more effective and better than the old ones, simply because they are new. One can in a way speak of a Hawthorne effect. This fact gives rise to reflection on the methodological limitations inherent in evaluation methods, based solely on participants’ own perceptions.

The discussion of adult educational professionalisation and the question of what an adult educator should be able master were introduced in the beginning of the article. On basis of the results of this study one may pose the question again: How can we tell which adult educational competences are expected to have the greatest effect on student outcome and performance?
References


