

# Experts in Teaching: IRIS Connect

Interim report on the pilot study preceding the research and development project "Expert in Teaching – IRIS Connect", Skive College of Education, VIA University College.

**Annemette Heine Wullum (Project manager)**  
**Frits Hedegaard Eriksen**

## **EXPERTS IN TEACHING: IRIS CONNECT**

### **HOW CAN WE DEVELOP STUDENT TEACHERS' RESEARCH COMPETENCE BY MEANS OF THE DATA COLLECTION AND DATA PROCESSING FUNCTIONALITIES IN IRIS CONNECT? AN EDUCATIONAL RESEARCH AND DEVELOPMENT PROJECT AT SKIVE COLLEGE OF EDUCATION, VIA UNIVERSITY COLLEGE 2012-2016.**

#### **The Challenge**

Different research findings show that the theoretical knowledge acquired in teacher education does not function as a corrective to personal history-based beliefs.<sup>1</sup> Holt-Reynolds shed light on this problem in a small-scale research project in which she compared nine students' outcome of a teaching course with their teacher's intentions.<sup>2</sup> She found that the students' layman conceptions were used to challenge their teacher's arguments. They did, however, not use their teacher's arguments to challenge their own layman conceptions.

In a review of the research conducted within this field in the 1990s, Wideen et al. conclude that students' perceptions in the form of myths, mental pictures or values work as a kind of filter sorting out the elements of the studies which are incompatible with their personal history-based beliefs.<sup>3</sup>

On the basis of his Ph.D. thesis, Rasch-Christensen concludes that new teachers teach like they were taught themselves, not like they learned to teach during their teacher education studies.<sup>4</sup> Teacher education research<sup>5</sup> provides comprehensive evidence that insights from teacher education do not necessarily - let alone sufficiently – challenge the students'

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<sup>1</sup> Lindhardt, L. (2007), *Hvor lærer en lærer at være lærer?* Ph.D. thesis, Aalborg University.

<sup>2</sup> Holt-Reynolds, D. (1992), "Personal History-based Beliefs as Relevant Prior Knowledge in Course Work". In *American Educational Research Journal*, Vol. 2 N. 2.

<sup>3</sup> Wideen, M. et al. (1998), "A Critical Analysis of the Research on Learning to teach: Making the Case for an Ecological Perspective on Inquiry". In *Review of Educational Research*, no. 2.

<sup>4</sup> Rasch-Christensen, A. (2010), "Danske lærere underviser, som de selv blev undervist". In *Kristeligt Dagblad*, May 29th 2010.

<sup>5</sup> OECD (2005), *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*.

personal history-based perceptions of effective learning management, and that this constitutes a heavy, conservative and ‘unprofessional’ element in the development of the teaching profession.

The underlying credo of the many teacher education reforms in recent years has been that more and deeper knowledge in itself will strengthen the students’ qualifications to solve the various complex tasks in educational practice.

A matter which is always neglected in connection with these education reforms is the crucial impact of the students’ personal history-based experiences and backgrounds on their learning outcome. The past fifty years of teacher education reforms have paid far too little attention to the students’ problems with linking that which teacher education offers to what they already are, what they have already learned and what they learn in other contexts while studying.

The content and structure of teacher education rest on the main assumption that students – through alternate studies at the college of education and periods of teaching placement – will acquire the necessary professional knowledge, skills and attitudes.

The assumption is rooted in the blind belief that knowledge and action are closely attached. Yet there is no evidence for this conception, and it creates a number of false expectations of unambiguous relations between the purpose of teacher education and the newly qualified teacher’s competences.<sup>6</sup> It is not sufficient to equip the students with the most recent research-based knowledge or tested experiences. This knowledge and these experiences must be brought into play with the students’ personal history-based beliefs.

In the research and development project “Expert in Teaching – IRIS Connect”, using audio-visual recordings of the students’ own teaching as our starting point, we intend to challenge the students’ personal history-based conceptions of what constitutes effective teaching through analysis, discussion and focused feedback.

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<sup>6</sup> Eriksen, Frits Hedegaard et al. (2011), “Vidensbaseret læreruddannelse – eller gør vi bare, som vi plejer?” In *Kristeligt Dagblad*, May 17th 2011.

## Pilot Study

**How can Skive College of Education support the students' research competence by means of the IRIS Connect data collection and communication tools? How can the results of the pilot study be used in in-service/CPD contexts?**

## Project Description

### Context

“The Danish ministerial order on the bachelor of education programme”<sup>7</sup> delineates the requirements to the students' research competence and communicative competence in connection with the bachelor project. Teacher professional research competence is defined as the ability to:

- a) Research, focus, describe, analyze, reflect on and evaluate problems and possibilities regarding the teacher's job and school activities, using relevant theory and practical insight.
- b) Include different positions (e.g. pupils, parents, school management team) and consider relevant perspectives in the analysis of teacher professional issues and problems.
- c) Focus on and describe dilemmas, tensions, conflicting aims and oppressive aspects in relations and structures as well as the behaviour and actions brought about by them.
- d) Collect, process and use relevant empirical school data in the form of impressions, experiences and knowledge from teaching placement and other practice contexts.
- e) Link and use professional and educational theories, concepts and methods.
- f) Give reasons and argue for teacher professional actions with professional insight and critical distance in a developmental perspective.

In a draft proposal for the ministerial order on the new teacher education, it says that the bachelor project “deals with information search, research, development and communica-

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<sup>7</sup> BEK no. 562 from 01/06/2011 – especially Appendix 6.

tion as the foundation of professional analysis, evaluation and action-directed planning of teacher professional tasks and problems.”<sup>8</sup> The competence objective is formulated as follows: “The student must be able to identify, research and develop teacher professional problems and put them into perspective.”<sup>9</sup>

The bachelor project, together with the teaching placement, constitutes the progressive element of teacher education. Both elements serve to ensure vertical coherence in the students’ studies. Yet teacher education must also cohere horizontally. The school subjects, the educational subjects and the teaching placement must be linked in a research-informed and development-based teacher education.

The curriculum of Skive College of Education addresses this coherence: “As a supplement to the subject-related didactics, an integrated element consisting of educational subject-areas forms part of the school subjects in the first and second years of study, cp. §25 and §26 in the ministerial order. This element continues in the school subjects in the third and fourth years of study.”<sup>10</sup>

Describing coherences in regulatory educational documents is relatively unproblematic. However, a lot of students struggle with making their studies cohere. They are especially challenged when faced with very complex tasks in educational practice. If we are to succeed in turning their meeting with practice into genuine learning, we need to find good ways of capturing this meeting and providing feedback on it, because the meeting must be captured if the students – alone, with their peers or teacher educators – are to get the opportunity to analyze and discuss it at a certain distance. Sound data collection and data processing methods are to help us create this distance. The students must learn to view themselves as another. The aim is to qualify their actions in and reflections on practice, and thus the focal area of the research and development project is the development of the students’ competence to analyze their own and others’ educational practice at a distance.

### **The Purpose of the Pilot Study**

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<sup>8</sup> “Udkast til bekendtgørelse for ny læreruddannelse – Appendix 4, undated (my translation).

<sup>9</sup> Ibid. (my translation).

<sup>10</sup> Læreruddannelserne i Nørre Nissum and Skive, *Studieordning 2011*, p. 17 (my translation).

The pilot study aims to explore whether IRIS Connect (IC) can contribute to qualifying student teachers' reflective practice. IC is a software package combining video conferencing technology, video streaming, a feedback functionality and a data processing generator. This very combination, it is presumed, is highly useful in terms of qualifying the students' research into and reflections on practice. By means of a remote-controlled video camera and a wireless audio-system, the student can record her teaching and thus re-create and capture practice. As opposed to ordinary video recordings of practice, IC enables peers and teacher educators, for instance, to observe the student's teaching synchronously as well as asynchronously and to provide feedback in the form of written comments or video messages. The feedback conveniently appears as book marks in the actual recording so that it is easy for the student to retrieve the teaching sequences which have been commented upon. In addition, the program has an application that makes it possible to generate customized research and reflection tools to be used when processing and analyzing the teaching recordings. The latter has the potential to make the students' data collection focused as well as manageable.

IC consists of a number of tools as well as an underlying dialogic view of teaching and learning which can support the development of the analytical elements of teacher education. Furthermore, IC can enhance the relation between the activities at the college of education and the activities in practice (theory-practice relation) and thus support the professional focus.

### **What Ideas Underlie the IRIS Connect Research and Development Project?**

The underlying view of learning seems to be inspired by Biggs.<sup>11</sup> In cooperation with Collis, he has developed a learning taxonomy called the SOLO-taxonomy.<sup>12</sup> It stands on four legs:

- A theory of learning (constructivism)
- An institutional theory of motivation (alignment)

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<sup>11</sup> Biggs, J. B. (2003), *Teaching for Quality Learning at University*. The Society for Research into Higher Education & Open University Press.

<sup>12</sup> Biggs, J. B. & Collis, K. F. (1982), *Evaluating the Quality of Learning – The SOLO Taxonomy*. Academic Press, New York.

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- A theory of learning aims and study strategies (deep learning)
- Various conceptions of progression in an educational course

The learning theory is best described as constructivist. It rests on the following assumptions:

- Knowledge is not transmitted through direct instruction
- Knowledge is created through the students' learning activities
- The crucial thing is what the learners/students **do**
- Effective teaching is about how intensively the students can be motivated to participate in the teaching at the educational institution and not least to work independently with preparing and processing the teaching.

Biggs points out that the teaching at universities and most likely university colleges and primary and secondary schools as well builds upon three very different conceptions of learning:

- Learning is a function of individual differences between the students/pupils.
- Learning is a function of the teachers' qualifications and actions.
- Learning is a function of the students'/learners' actions. What do they DO?

Sometimes we focus primarily on the 'learner material':

Learning is a function of individual differences between the students.

We focus on the students'/pupils' qualifications. Knowing a subject matter well and being able to present it in a clear way is regarded as the students'/pupils' own responsibility. Differences in terms of learning are first and foremost a result of the students'/pupils' abilities, motivation, entry examination and exam results, and their 'abilities' are viewed as the most important factor. Rather than being an educational activity, teaching is turned into a selection activity. The practical consequences of this conception are that teaching is easily perceived as an act of 'moving' information from the teacher's head to the student's/pupil's head. The teacher is seen as the knowledgeable expert, and curriculum is viewed as something that must be 'covered'.

From this perspective, bad teaching outcome is caused by deficiencies in the student/pupil.

At other times we focus on learning as a function of differences between the teachers' actions:

Teaching is still regarded as transmission – in this context, transmission of concepts and conceptions, not just information. Learning is seen more as a function of what the teacher does than of the type of students/pupils. Teachers work towards acquiring a range of teaching tools, and they willingly attend “how-to-do” courses. The responsibility for insufficient learning outcome is now placed on the teacher.

### **The Research Focus of the Pilot Study**

In the research and development project “Expert in Teaching – IRIS Connect”, we lean towards Biggs' third conception of learning:

With special focus on what the pupils and the students DO, we focus on all components within the teaching system. We work on the basis of a systemic view of learning – all variables impact on each other. In this perspective, it is not possible to say: “I taught it, but my students or pupils did not learn it.” The competent teacher knows how to use a range of methods. Yet if learning does not take place, these methods are irrelevant. The focus is on what the students/pupils do and on the learning that happens or does not happen.

The other three legs in Biggs' “theory” point out that the students' learning outcome is less a product of the individual teacher's teaching than of the entire institutional teaching context. There must be agreement between the demands put on the students in the course of their studies and the way we assess their performance at the exam because of the incredible washback effect of the exam. If normative views on how to organize the school are demanded in the examination room rather than empirically anchored analysis and discussion, it will influence the students' organization of their studies.

The depth of the students' learning outcome can be assessed taxonomically. The SOLO taxonomy describes the progression from surface learning to deep learning, from pure reproduction to a scientifically and methodologically anchored analysis and discussion of a study or a case.

The ideas underlying IRIS Connect and the focus of the research and development project are also indebted to Michael Fullan and Andy Hargreaves, whose thoughts have recently been formulated in *Professional Capital – Transforming Teaching in Every School*.<sup>13</sup> Professional capital is not individual. Teachers develop in communities of practice by sharing knowledge and experiences with each other.

Finally, the thinking is indebted to John Hattie, who has called attention to the value of “Visible Learning” through his meta-analyses concerning effective teaching.<sup>14</sup> The students can benefit greatly from documenting their teaching and considering it analytically and reflectively. To put it differently: The students can benefit from “viewing themselves as another” and observing what they do as teachers.

It is, however, as important for the students to have someone observe their teaching and get feedback from peers and/or teachers.

### **Micro-teaching**

Elements of the teacher profession almost take the form of craftwork. They can be taught as a craft. It seems that micro-teaching, an almost craft-like introduction to teaching methods and analyses and discussions of these methods, may have great significance for the students’ success in educational practice. The students often believe that they act differently than they actually do. Therefore, it is of great importance that the short teaching sequences are captured as sound and pictures that can be made the object of analysis and discussion.

### **Themes**

In the research and development project “Expert in Teaching – IRIS Connect”, the students work with:

- Documenting their own practice

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<sup>13</sup> Hargreaves, Andy and Michael Fullan (2012), *Professional Capital – Transforming Teaching in Every School*. Teachers College Press, Columbia University.

<sup>14</sup> Hattie, John (2009), *Visible Learning – A Synthesis of over 800 Meta-analyses Relating to Achievement*. Routledge, London & New York.

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- Observing themselves as well as that which they do as teachers and supervisors
- Getting peers and teachers to observe what they do as teachers and supervisors; i.e. receiving feedback
- Sharing their new insights with peers and teachers and in turn learning from their peers' and teachers' insights (knowledge sharing)
- Establishing communities of practice
- Developing through micro-teaching and feedback

**The aims are for the students to develop the following skills:**

- To plan, organize, implement, evaluate and adjust their teaching
- To document situated and experiential learning
- To handle both self-observation and self-reflection
- To design and carry out empirically anchored research and evaluation
- To receive and provide feedback
- To research and develop their own practice
- To identify or establish communities of practice within the school and across schools and countries

**The Pilot Study and the Research and Development Project that follows**

In the research and development project we intend to make the students' personal history-based beliefs, their strongly indexed, context-dependent and culturally conditioned knowledge visible and through analyses and discussions challenge their conceptions of what constitutes effective teaching.

We wish to expose central aspects of the culture of teacher education and school culture, which the students' personal history-based beliefs are anchored in. We will concern ourselves with both perceptions of teaching as well as quantifiable results indicating how often certain features occur in the teaching at the college of education and in the teaching placement/practice in the school.

As a supplement to our research into educational practice, we will conduct micro-teaching at the college of education to see if such teaching has any transfer value in relation to school teaching. Can the students develop their school teaching skills by teaching each other at the college of education?

In the research and development project following the pilot study, we also intend to explore to what extent knowledge of other people's ways of teaching and organizing study programmes may inspire and develop new local conceptions. This part of the research and development project will be designed in cooperation with a college of education in Norway and one in the Netherlands, and it will take the form of a comparative study.

### **Assumptions:**

The pilot study rests on the following assumptions:

- The students' personal history-based beliefs, their strongly indexed, context-dependent and culturally anchored knowledge can be made visible, and through analyses and discussions their layman conceptions of what constitutes effective teaching can be challenged.
- Using the IRIS Connect data collection and data processing tools will support the work with both documentation and analysis in relation to the students' own research.

### **Content and Participants**

The pilot study follows a number of 4<sup>th</sup> year students who are to carry out their final teaching placement as a prelude to their profession bachelor project work in 2013; a number of 1<sup>st</sup> year students studying English as a school subject, and a number of 3<sup>rd</sup> year students cooperating with a school in Skive on an English teaching project. The students' teaching is recorded by means of IC and is made the object of analysis and reflection for the individual student, peers and teacher educators. All three parties use the commentary functionalities in IC and communicate about the teaching. Furthermore, the students test the data processing generator when they process and analyze data from their teaching.

In the course of the pilot study, we intend to explore how the individual student's analyses, reflections on and understanding of practice are qualified in interaction with peers' and teacher educators' feedback, which is supported by the facilities of the data processing generator. Besides regular analyses of the students' actions in and reflections on practice, the pilot study will also consider to what extent the use of the tools and functionalities in IC supports the students' research competence as it materializes itself in their study products and bachelor projects.

### **Interim Findings**

The purpose of the pilot study prior to the research and development project "Expert in Teaching – IRIS Connect" is to qualify the students' reflective practice. Using the IRIS Connect video cameras, software tools and functionalities, the students have worked with:

- Documenting their own practice
- Observing themselves and that which they do as teachers
- Having someone else observe what they do as teachers and getting feedback on it
- Sharing their new insights with peers and teacher educators (knowledge sharing)
- Establishing communities of practice
- Developing through micro-teaching and feedback

### **The aims were for the students to develop their skills in:**

- Planning, organizing, implementing, evaluating and adjusting their teaching
- Documenting situated and experiential learning
- Handling self-observation as well as self-reflection
- Designing and carrying out empirically anchored research and evaluations
- Receiving and giving feedback
- Researching into and developing their own practice
- Identifying or establishing communities of practice within the school or across schools and countries.

The video recordings, having been transformed into information, have served to support the work towards the goal. We have focused on two kinds of products: perceptions

of teaching (teaching culture) and quantified results, which indicate how often specific features occur.

**We have attempted to confirm or disprove the following assumptions:**

- The students' personal history-based beliefs, their strongly indexed, context-dependent and culturally anchored knowledge can be made visible, and through analyses and discussions their layman conceptions of what constitutes effective teaching can be challenged.
- Using the IRIS Connect data collection and data processing tools will support the work with both documentation and analysis in relation to the students' own research.

**Data**

The data material consists of:

- A large group of students' video recordings of their own teaching from their teaching placement.
- Systematic video recordings of a few students' own teaching.
- Systematic video recordings of three school teachers' teaching and subsequent analysis and discussion of the possibilities of using video recordings and the IRIS Connect tools and functionalities in the development of their own teaching.
- The students' own analyses of their teaching as they appear in their teaching placement paper. We have selected a few papers written by 1<sup>st</sup> and 4<sup>th</sup> year students.
- Interviews with two students who have used video recordings and the IRIS Connect tools and functionalities.
- Focus group interview with 1<sup>st</sup> year students.
- Three-party meetings (student, teaching placement teacher and teacher educator).

### **Interim observations:**

The video recordings and the use of the IRIS Connect data processing tools seem to open the students' eyes to aspects of their teaching that they did not notice while they were teaching.

### **Confirmations and surprises**

Our assumptions have been substantially confirmed. The students – as well as the school teachers – can be motivated to 'see themselves as another'. They are good at focusing on themselves as teachers. On top of this, they are capable of reflecting on what they see and of responding sensibly to it. The analyses and discussions motivate them to teach in different ways than they were taught themselves.

It is perhaps surprising that they seem to have difficulties observing others' actions in a qualified manner and learning from it. It is difficult to provide feedback, and it is difficult to learn from others' actions if the aims have not been stated clearly. This applies to both the students and the teachers. If the students' learning outcome from their teaching placement is to be improved, it is probably necessary to work with both the students' and the teaching placement teachers' feedback skills. When we develop the project, we will have to work thoroughly with feedback skills as well as formulating clear teaching as well as teaching observation aims.

### **What have the project participants learnt?**

The data material which we primarily draw on when evaluating the students' learning outcome is based on especially 1<sup>st</sup> year students because the 4<sup>th</sup> year students still have not handed in their bachelor papers. We have chosen to observe two students closely: A 1<sup>st</sup> year student and a 4<sup>th</sup> year student. The data material does, however, cover all 1<sup>st</sup> year students with English as a school subject, three teaching placement teachers and a number of 4<sup>th</sup> year students with English as a school subject.

The 1<sup>st</sup> year student whom we have observed especially closely is data-covered by means of comprehensive video recordings of many lessons, a three-party meeting, a teaching placement paper and an interview. The other 1<sup>st</sup> year students have been data-covered by means of live-stream recordings, where we – the teacher educators – controlled the live-stream-camera from another room than where the teaching took place. We could have chosen to control the camera from the college of education, but we chose to do it in a room at the teaching placement school because the recordings were followed by a three-party meeting or a supervision meeting at the teaching placement school.

We have also data-covered three teaching placement teachers by means of live-stream-recordings of their teaching. They shared the recordings with us and each other, and subsequently, we discussed what we observed in the recordings.

In the interview, the student (XX) whom we observed especially closely said, just like his peers, that the recordings had been an eye-opener to him in many ways. He also told us that the recordings, combined with the three-party meeting, had made it clear to him that his teaching had to be organized differently if the pupils' learning outcome was to increase. Through his work with the teaching placement paper and in the interview, he emphasized the significance of the theoretical processing of the recordings for his understanding of what he had done and what he should have done: "It was a pleasure writing the teaching placement paper because suddenly all the pieces of the puzzle fell into place."

It is evident from the teaching placement paper that XX has been challenged by being in educational practice and that he has struggled to understand the problems he encountered through literature studies and supervision. He also says that precise feedback cannot be overestimated!

XX repeatedly states in the interview that his layman conceptions of what constitutes effective teaching were challenged, and he shows it in his teaching placement paper!

The teaching placement teachers said that they benefited much from seeing themselves teach. They were very good at identifying issues that they wanted to look further into, but

they had difficulties providing feedback to each other. In fact, they also had difficulties learning from each other through observing each other's teaching.

Being a teaching placement teacher, the main function is to be able to provide feedback and to focus on central themes in others' teaching. It seems that there is a great potential in working with the teaching placement teachers' qualifications in terms of analyzing teaching and providing feedback on the basis of sound observations and analyses.

Working with micro-teaching has been a greater challenge than we initially imagined. On the basis of our as yet limited experiences with micro-teaching, it is difficult to make qualified conclusions of the possibilities of practising planning and carrying out short teaching courses which are tested at the college of education. What we can say is that we need to work much more systematically and thoroughly with micro-teaching in order to attain sensible results.

### **The IRIS Connect Tools and Functionalities**

One of the aims of the pilot study was to explore whether IRIS Connect can contribute to qualifying student teachers' reflective practice. Our interim conclusion is that the IRIS Connect tools and functionalities are especially useful in supporting the aims of our project. Only one student has called for an even more careful registration of the pupils' activities than the one in the existing software. The student wanted the pupils' activities to be registered by the second rather than the minute. He investigated the pupils' oral skills and found out that a large group of pupils fell out of the graphically generated statistics because they did not speak a full minute of English in the course of one lesson. We discussed whether this technical limitation should be seen as an eye-opener rather than a shortcoming!

Whether fine-tuning the system makes sense or not will not be addressed at present. However, we wish to emphasize that the tools and the functionalities have been extremely useful in the work with collecting, processing and sharing data.

### **Presentation of the project**

A presentation of the project, including the interim conclusions, has been handed in as a two-minute video sequence.

## **Recommendations**

If one of the aims of teacher education is to deconstruct the students' layman conceptions of what constitutes effective teaching, replacing them with professional and didactic competences, it makes sense to work with video-documenting the teaching – particularly to work systematically, analytically and reflectively with ordered data from the teaching. IRIS Connect is very useful for these purposes.

If we wish to optimize the work with the study activity model, teaching the students to establish challenging communities of practice is a good investment. These communities of practice must be founded on the students' competences to document, analyze and discuss their own and others' teaching. The students must learn to provide qualified feedback to one another.

If we wish to optimize the students' learning outcome in their teaching placement, it makes sense to organize in-service training for teaching placement teachers, where they work with systematic documentation, analysis and discussion of teaching with special focus on providing qualified feedback.

If we want the students to acquire craft-like skills when it comes to planning, carrying out and evaluating teaching, it makes sense to work with micro-teaching.

If we wish to work systematically with the students' research competences, purchasing more IRIS Connect cameras and user licenses is a good investment.

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