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Learning to teach in higher education: how to link theory and practice

Paul van den Bos[a] & Joyce Brouwer[a]
[a] Department of Research and Theory in Education, Faculty of Psychology and Education, VU University, Amsterdam, The Netherlands
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Learning to teach in higher education: how to link theory and practice

Paul van den Bos* and Joyce Brouwer

Department of Research and Theory in Education, Faculty of Psychology and Education, VU University, Amsterdam, The Netherlands

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In this study the learning process of 12 Dutch novice university teachers was monitored during a five-month induction programme. The teachers were interviewed before and after the programme and were asked to fill in several email logbooks during the programme. A change process was identified, in which experiencing and experimentation played a central role. In particular, modelling by the teacher educator, the observation of video cases, reflection on these with peers and experiencing success in their own practice seemed to be important incentives that encouraged teachers to adopt and eventually implement new pedagogical approaches. On the basis of our data, we think that teachers' conceptions and teaching practice are best developed simultaneously and that the design of induction programmes should support this process.

Keywords: higher education; professional development; reflection in action; teacher education; induction programmes; induction programmes

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1. Introduction

> 'I really see it differently now from when I started'; 'An eye-opener!'; 'I now understand it's about something completely different'; 'For me the penny has dropped!'

Comments like these are quite common when participants evaluate our induction programme for novice university teachers at Dutch universities of applied sciences. No doubt that this is very rewarding for us teacher educators, but it also raises the questions what exactly has changed and consequently which programme features and teacher educator actions were particularly helpful in this change. These questions led us to study in depth the learning experiences of 12 participants of our programme. We tried to get a better understanding of which learning experiences were particularly relevant to them and how programme content, learning activities and teacher educator actions were most supportive. In this study, we investigated the change the 12 participants reported by asking their opinions on core themes concerning teaching and learning in higher education before and after the programme. During the programme, we asked them to fill in logbooks about their learning experiences.

The logbooks could give an insight in the programme elements that were helpful and could be extended, what we should add and notably, which elements are actually not as beneficial as we hoped they were.

*Corresponding author. Email: p.j.p.vanden.bos@vu.nl

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2. Background

The teacher's role in higher education is changing quickly. More and more universities expect teachers to meet societal demands, the demands of the professional field and to deal with a diverse new generation of students. To be able to respond to this new role, appropriate teacher professionalisation is needed. Accordingly, in Dutch higher education there was a significant expansion of induction programmes during the last decade. A vast variety of programmes is currently being offered.

There seem to be two different perspectives on the design of teacher induction programmes relevant to higher education: a linear perspective and an interactive perspective. The first perspective is described for instance by Tigelaar et al. (2004). They found that at present in the Netherlands, experts (policy-makers, teacher educators and researchers) prefer induction programmes that aim at changing teachers' conceptions towards a more student-oriented direction. Instead of aiming at the transmission of knowledge, teachers should pay more attention to stimulating and mentoring student learning. In a more student-oriented teaching approach students will be more likely to adopt a deep approach to learning, an approach associated with higher quality learning outcomes (Trigwell, Prosser, and Waterhouse 1999).

This focus on conceptual change mirrors international trends. Prebble et al. (2004) describe several recent programme effect studies. They observe a shift from free-standing activities, mostly focused on the training of practical skills to more coherent, long-term programmes focused on moving teachers' conceptions towards stimulating and mentoring student learning. According to Prebble et al. (2004), programmes undertaken by Ho (2000), Gibbs and Coffey (2004) and more recently in Europe by Postareff, Lindblom-Ylänne, and Nevgi (2007) and Stes (2008) are examples of programmes focusing on this shift. This preference for conceptual change as the main objective of induction programmes in higher education is based on the assumption that to achieve change in teaching behaviour, teachers' conceptions must first be made explicit and eventually changed (Trigwell and Prosser 2004). In some of the programmes aiming at conceptual change, the shift from a teacher-centred to a student-centred conception is explicitly portrayed as a causal, linear process (Ho 2000; Gibbs and Coffey 2004).

In a second perspective this assumed linearity and causality of the change process is questioned (Devlin 2006; Guskey 2002; Clarke and Hollingsworth 2002). Guskey (2002) claims that new experiences can sometimes trigger new thinking, which means that experimenting with teaching practices can be a starting point for teachers to reconceptualise their own thinking about teaching and learning. So developing skills in a particular context can be relevant at that moment and eventually lead to a change of conceptions later on. Clarke and Hollingsworth (2002, 951) present a comprehensive 'interconnected model of professional growth', in which teacher development is seen as a 'continuous interplay between beliefs and practice'.

How conceptions of novice teachers and their actual teaching practices are intertwined is an urgent theme in the research on teacher education for primary and secondary education. There is a growing consensus that more attention must be paid to the personal relevance of what is being taught in teacher education programmes and that the novice teachers' experiences in teaching practice must be taken into account (Wideen, Mayer-Smith, and Moon 1998; Darling-Hammond 2006; Brouwer and Korthagen 2005). The learning process of novice teachers must be seen as an ongoing interaction between conceptions and daily practice through reflection. McAlpine and Weston (2000) describe

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a process of reflection-in-action, in which novice teachers gradually build up their own unique conceptions in a teaching context, with an emphasis on the personal relevance of learning. Put simply, for novice teachers the usefulness of 'new' conceptions of teaching and learning must be 'proven to work' in their educational practices and adjusted to fit their own personal contexts. In general, it can be said that in this line of thinking novice teachers must be facilitated to build up their own personal theories within their own specific instructional context. Korthagen and Kessels (1999) call this 'guided re-invention'.

For the practice of teacher education, this means the following:

(1) the novice teachers' experiences in their own teaching practices should be seen as a focal point in the induction programmes. The possibility to be observed and to observe others accompanied by discussions and systematic reflection is put forward by several authors as being very useful (McAlpine and Weston 2000; Clarke and Hollingsworth 2002; Darling-Hammond 2006; Wang, Odell, and Schwille 2008; Brouwer and Korthagen 2005).
(2) To personalise the novel conceptions promoted in the teacher induction programme, Korthagen, Loughran, and Russell (2006) recommend to make use of the 'dual role' that novice teachers play during an induction programme. There is an ongoing alternation between the participant's teacher role and his or her role as a student in the programme. Making this process explicit and reflecting on it could greatly enrich the learning process. The important role of modelling by the teacher educator in this process has been recognised by Lunenberg, Korthagen, and Swennen (2007). As a consequence, in teacher education for primary and secondary education in the previous decade, there has been a great deal of interest in themes like school-based teacher education and workplace learning and in pedagogies that link theory and practice (Darling-Hammond 2006).

The two perspectives on teacher learning we described earlier imply different designs of induction programmes. The second, interactive perspective, developed in the context of primary and secondary education, offers quite clear guidelines for course design. In the literature on first linear perspective (mostly used in the context of higher education), however, we have not been able to find descriptions of the design of induction programmes, apart from Ho's (2000) programme.

In our programme, we tried to connect to the second perspective. Apart from practising teaching skills and discussing teaching theory a large part of the course time was used for reflection on teaching and learning activities used in the programme and videos of teaching by the participants in their own practice.

This brings us to our two research questions:

(1) *What have our participants learned?* In what respect did their conceptions about teaching and learning change and what did they actually change (during the programme period) in their teaching practice.
(2) *How did they learn this?* Which learning activities during the meetings were considered useful and instructive and which teacher educator actions/interventions were considered supportive.

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The answers to the questions had to help us in fine-tuning the educational design of our own programme. After answering these questions, we would like to reflect on which theoretical perspective accounts for our findings and on what kind of general principles for the design of induction programmes this framework implies.

3. Research design

3.1. Respondents

We studied the learning experiences of 12 teachers in 2 of our course groups between September 2008 and January 2009. One group consisted of 11 teachers of the same university of applied sciences (UAS) and a second group of 14 teachers from different UASs. Prior to the first course meeting, we sent an email to both groups inviting them to take part in our research. As we wanted to carry out a qualitative study, our research group was limited to six or seven participants from each course group. The first 12 teachers to respond – six teachers from the first course group and six from the second – were invited to take part in the study. These 12 teachers represented different disciplines (e.g. communication, tourism, health, technics, law, management) and differed in the amount of teaching experience (between 7 and 30 months), field and degree.

The main task of a Dutch UAS teacher is to teach students in a variety of contexts (e.g. lectures, seminars, individual and group work). They have a certain degree of autonomy while designing and implementing their courses. For our participants being an effective teacher is of great importance and were therefore motivated to attend the programme and cooperate during our study.

3.2. The programme

The programme consisted of 14 one-day meetings over a five-month period. The central theme in our programme was how to engage students and how to encourage active learning. Three main aspects of the teacher's role were discussed: (1) the use of effective and stimulating classroom strategies, (2) mentoring individual students and supervising group work and (3) course design and assessment. During the meetings we discussed theory about teaching and learning, supported the novice teachers to articulate their own conceptions about teaching and learning, and we provided tools for better preparing and designing lessons and courses. In every course meetings the teacher educators' activities and the pedagogical principles applied, were made explicit and discussed. The teacher educators actively embraced the 'teach as you preach' principle.

Additionally, we encouraged teachers to identify and try out these theories and principles in their own teaching, videotape these, and discuss the recordings with peers and the teacher educator.

In short, in our programme we tried to move the conceptions of our participants in a more student-centred direction, but at the same time we encouraged and supported every participant to search for what works for them in their own particular teaching practice.

3.3. Data collection

We carried out an interview one week prior to the start of the programme, three digital logbooks by email during the programme period, and an interview one week after the

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1. Motivation driven by student	< >	Motivation driven by teacher
2. Teacher covering all content	< >	Students active with key concepts
3. Subject knowledge	< >	Vocational competences
4. Knowledge as starting point	< >	Student experiences as starting point
5. Teacher links theory and practice	< >	Student links theory and practice
6. Interaction supplementary to learning	< >	Interaction essential to learning
7. Summative assessment is key	< >	Formative assessment is key
8. Teacher focused on subject content	< >	Teacher focused on student questions
9. Same programme for all students	< >	Customized programmes

Figure 1. The nine teaching dilemmas.

programme had finished. We used two instruments: a semi-structured 'dilemma instrument' used in the interviews and digital logbooks in which the teachers wrote their reports.

The dilemma instrument was used to determine, whether and in what way, the teachers changed their mind about relevant educational themes. From the extensive literature on teaching conceptions (see, e.g. Samuelowicz and Bain 2001; Kember and Kwan 2000; Trigwell, Prosser, and Waterhouse 1999), we selected the nine most frequently mentioned themes: motivation, teacher control, educational objectives, the starting point of learning, linking theory and practice, the importance of interaction, assessment, taking student characteristics into account and programme design (see Figure 1).

In Figure 1 the dilemmas on the left represent a teacher-centred focus, aimed primarily at knowledge transfer. The dilemmas on the right represent a student-centred focus, aimed at stimulating and facilitating the learning process. In the dilemma instrument the polarity of the nine scales was randomly alternated.

To provoke our respondents to take a stand, the dilemmas were presented as seven-point Likert scales. An example of a scale is presented in Figure 2. Before and after the programme, each teacher was asked to take a position on the seven-point scale by 'thinking aloud'. In the second and final interview, after completing the instrument again, the teachers were confronted with their original scores on the pre-test and were explicitly asked to identify the dilemmas on which they felt they had changed their position.

At three moments during the course, the participants were asked (by email) to write a digital logbook answering the following questions:

A. What new insights have you gained?
B. What have you changed in your actual practice?
C. Which course elements were supportive?

The open-ended questions in the three digital logbooks provided additional information about the changes the teachers reported (questions A and B) and about which programme characteristics they considered to be supportive (question C).

A. When time is limited, main concern is that the teacher covers all content	*Before start of programme:* OOOOOOO *After finishing programme:* OOOOOOO	B. When time is limited, main concern is that students are active with key concepts

Figure 2. Example of dilemma 2 as presented to the teachers.

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Instruments	*Type of data*	*Research Questions*	
		1. **What** did they learn?	2. **How** did they learn this?
Nine dilemmas, pre-test and post-test	Quantitative: Scores on the Likert scales	X	
	Qualitative: Think aloud protocols	X	
Three digital logbooks	Qualitative:		
	Question A: What new insights have you gained?	X	
	Question B: What did you change in your actual practice?	X	
	Question C: Which course elements were supportive?		X

Figure 3. Research design: instruments, type of data and instruments.

So, to get an answer to our first research question: 'What did our participants learn', we used three sources: (1)'thinking aloud' protocols while responding to the nine dilemmas, (2) the absolute scores on the Likert scales and (3) the answers to the open questions A and B in the three digital logbooks. By doing this, we were able to apply data triangulation and to get a fairly complete portrait of what the teachers learned in our programme.

To get an answer to our second question 'How did they learn', we used the answer to the open question C in the digital logbooks. In Figure 3, the research design is visualised.

3.4. Data analysis

The dilemma instrument provided quantitative as well as qualitative information about the changes experienced by the teachers. We calculated group means of pre- and post-test scores. The 'thinking aloud protocols' relating to the nine dilemmas were recorded and transcribed. Both researchers independently analysed the transcripts and identified changes in conceptions. Only those reported changes on which both researchers agreed were taken into account. A phenomenographic research method (Marton 1986) was used to categorise the data from the digital logbooks. The following procedure was used to analyse these data.

Step 1. The text fragments were selected and sorted. Only those text fragments relevant to the main questions were selected: A. Which new insights have you gained? B. What have you changed in your actual practice? C. Which course elements were supportive? To start with, both researchers read the transcribed text for each question and together they determined which categories could be identified in the material. After this, both researchers independently assigned text fragments from the raw material to the categories. Only a 70% match was reached, which we considered to be insufficient. Apparently, while sorting the text fragments, the two researchers had interpreted the categories differently. Furthermore, the raw text included statements containing more than one concept. In a new session, the text fragments were reduced to single statements. In the end, we identified 271 single statements (A. 85, B. 89, C. 97).

Step 2. The creation of categories. The statements were written down on small cards. For each main question, both researchers independently studied and sorted the statements, created suitable categories and assigned the statements to the categories. When it came to grouping the statements, this second time, there was a match of approximately 95% between the researchers.

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Step 3. Discussion and reaching consensus. In another session, both sets of categories were explained and discussed by the two researchers. A shared set of categories was created on the basis of consensus.

4. Results

4.1. What have our participants learned?

4.1.1. Responses to the nine dilemmas, quantitative and qualitative

In Figure 4, we visualised group mean scores on pre- and post-test for the nine dilemmas. The nine dilemmas were sorted by the mean of the post-test. The dilemmas 2 (student activity), 3 (vocational competencies), 6 (interaction) and 9 (customised programmes) show a distinct score on the 'student-oriented' side of the scale' both before and after the programme. Apparently, most teachers agree on the importance of these themes. The relatively high score on vocational competencies is to be explained by the vocational orientation of the students and teachers at universities of applied sciences. The importance of a customised programme was expressed by one of the teachers:

> A standard programme? No, that would be suitable to standard students, but we haven't got many of them! (Teacher 8, before the programme)

The dilemmas 2 (student activity) and 6 (interaction) are already highly valued before the programme; after the programme they are even more valued.

Figure 5 shows on an individual level on which dilemmas change had taken place, as explicitly described by the participants in the interviews.

Figure 5 shows that 7 out of 12 teachers explicitly mentioned that after the programme they considered student activity more important than before the programme:

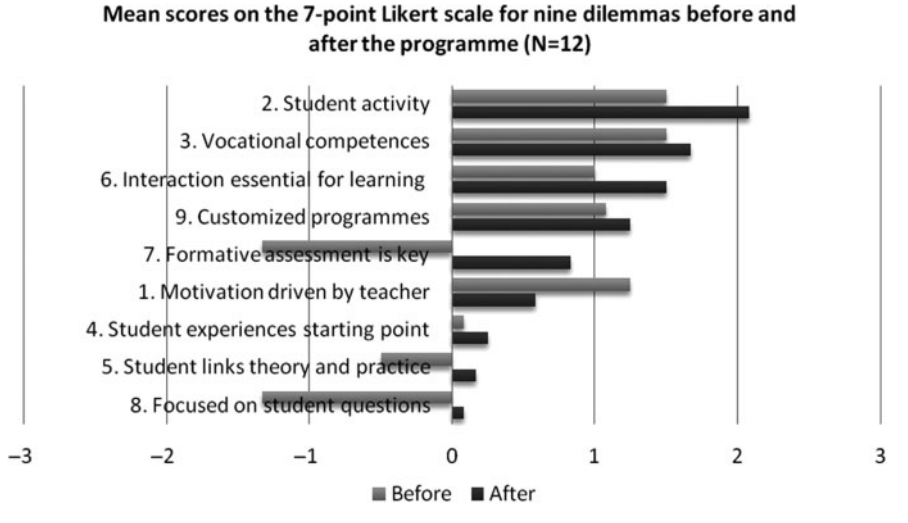

Figure 4. Mean scores on the seven-point Likert scales for the nine dilemmas before and after the programme, sorted by scores on post-test.

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	Teachers												
Dilemmas	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**NT**
2. Student activity		x	x	x	x	x	x		x				7
6. Interaction essential to learning	x		x		x	x	x					x	6
7. Formative assessment	x			x	x	x			x			x	6
5. Student links theory and practice	x	x								x		x	4
4. Student experiences starting point	x							x	x			x	4
3. Vocational competences		x	x					x	x				4
1. Motivation by teacher				x								x	2
8. Focused on student questions							x					x	2
9. Customised programmes								x				x	2

Figure 5. Reported change on the nine dilemmas in the interviews. (Sorted by NT = number of teachers that reported change on this dilemma).

> I really think that you can expect more of students than I had previously assumed. You can expect them to start studying the content and you can ask this from them. Before, I thought they just wouldn't do it. (T4, after)

> That's right, when I actually look at my old way of teaching, it was just hammering in the content. Now I would choose to let the students be active, so they become familiar with the content. This does indeed require different teaching techniques. (T2, after)

Furthermore, 6 out of 12 teachers explicitly mentioned that after the programme they considered interaction even more important:

> Interaction means that you discuss, discussing means that you think, that you are busy and that the grey matter up there starts moving and … that's satisfying in any case. Yes, my view on learning has really changed a lot on this. (T3, after)

Figure 4 shows an extensive change on dilemma 7 (assessment) at the group level. This change of opinion was confirmed by the results at the individual level. See for this individual change Figure 5 and in particular Figure 6 in which the results of the logbooks are being shown.

The answers to dilemma 1 (motivation) proved to be unreliable, because the formulation of the dilemma led to different interpretations by the participants.

Teacher 11 reported change on none of the dilemmas, because he was already aware of his student-oriented focus at the beginning of the programme and felt strengthened in these conceptions afterwards. For this teacher, the effect of the programme consisted mainly of an expansion of his assessment skills.

Teacher 10 reported change on only one dilemma mainly because she still felt uncertain about most dilemmas and could not easily choose between the two sides of all dilemmas.

4.1.2. Logbook questions A and B

Figure 6 and 7 show the changes reported in the digital logbooks. In these figures we distinguish between the total number of statements made (for example by the same teacher in several logbooks) and the number of teachers that made a specific statement (in one or more logbooks). This provides an insight into the frequency of the statements (NS) as well as the distribution of the statements among the 12 teachers (NT).

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Category	Examples	Number of statements/teachers
A1 Role of Assessment	*'Thinking about assessment forces one to reflect on the whole'* (Teacher 5). *'How teachers differ in grading a test, even when there is a response model'* (T6).	*13/8*
A2.1. Understanding learning processes in general	*'More convinced about connecting with students'* (T2). *'A better understanding of the learning processes and how to connect with them'* (T5).	*13/6*
A2.2. Understanding learning processes: student activity	*'In the lessons students themselves have to get active, it is not my responsibility to entertain them'* (T11). *'The student has to cover the course material, not the teacher'* (Tl2).	*11/8*
A3 Awareness of teacher influence	*'More aware. Thinking about my own role'* (T6). *'Gradually more grip on how I teach'* (T11) *'Makes you think about how you yourself learn* (T9).	*13/8*
A4 More focused designing	*'Course design: using learning objectives'* (T4). *'More aware that good preparation really works'* (T8). *'Taking the course objectives as a starting point instead of the course content'* (Tl3).	*15/8*
A5 Awareness of complexity	*'To reach all students optimally is difficult'* (T4). *'Formulating objectives is difficult'* (Tl0). *'Simple image of teaching has to be adjusted; there is a lot to learn'* (T11).	*7/6*
A6 Awareness of strengths	*'Confirmation of ideas'* (T3).	*4/3*
Not interpretable		*9/6*

Figure 6. Logbook question A. What new insights have you gained?

The new insights reported by the teachers (Figure 6) as well as the changes they made in their actual practices (Figure 7) are consistent with the pre- and post-test results (Figures 4 and 5): the importance of assessment as an instrument for controlling the learning processes (A1) and the need to promote student activity (A2.2). According to the logbooks eight teachers regarded the concept of student activity (A2.2) as an eye-opener:

> the student has to cover the course material, not the teacher. (T11)

Moreover, the logbooks show that particularly having a better understanding of learning processes in general (A2.1) helps teachers to become more aware of their own roles (A3) and to focus more clearly their actions (A4).

As a consequence, the teachers reported that they were reflecting more on teaching processes and were teaching in a more focused way (Figure 7; B2, B3, B4). All 12 teachers reported that they tried out new teaching techniques and extended their repertoires (B1). This item was mentioned 32 times across the 3 logbooks.

4.1.3. What did not change?

Most teachers did not change their minds with regard to dilemma 4 (taking student experiences as a starting point). Teacher 6 formulates a possible reason for this lack of change:

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Category	*Examples*	*Number of statements/teachers*
B1 Experimenting with teaching techniques	*'Started to work in a more varied way. More teaching techniques'* (Teacher 2). *'Students more engaged as a result of interaction '* (T3).	*32/12*
B2 More focused teaching	*'In lessons looking forward and looking back have become more natural'* (T6). *'Yes, shaping my teaching better. Good and thorough preparation for my classes'* (Tl0).	*14/10*
B3 More reflection	*'More critical thinking about design'* (T5). *'Think more about how to give the students more grip on the subject'* (T9).	*13/9*
B4 Pedagogical approach	*'More outspoken in my teaching'* (T9). *'Involving quiet students'* (T11).	*10/7*
B5 Assessment serving the learning process	*'Started to use formative assessment and to apply the things I learned about assessment '* (T5). *'Improvement of assessment: quality control beforehand, use of test matrix, better questions, response model, better cutting score'* (Tl2).	*10/4*
B6 Discussion with colleagues	*'More discussion with colleagues'* (Tl0). *'More listening to experiences of colleagues '* (T13).	*3/3*
Not interpretable		*7/7*

Figure 7. Logbook question B. What have you changed in your actual practice (during the programme)?

> The dilemma is, that in my experience, for the subjects I teach, the basic knowledge among students is very limited. (T6, after)

This concern about the lack of basic knowledge was formulated by several teachers. The answers referring to dilemma 8 (focusing on students' questions) at the individual level seem to be in line with this concern:

> I do think students' questions and concerns aren't that important. I think that they are important for the way you pass on the content, but not for the content that has to be taught. (T3, after)

> I really think you should take students' interests and concerns into account, but having some prescribed subject matter is part of that as well. It is still a bit of both. (T1, after)

Apparently, teachers feel that by taking the student as a starting point they lose out in imparting basic knowledge and safeguarding a certain grade level.

4.2. How did our participants learn?

4.2.1. Logbook question C

All teachers clearly thought that the examples that were demonstrated and discussed during the course meetings were very instructive (see Figure 8; C1). One reason for this

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Category	*Examples*	*Number of statements/teachers*
Cl Experiencing good practices during the programme, congruence	*'The programme in itself acts as a mirror for the department'* (Teacher 9). *'Experiencing learning as a student'* (T11). *'Commitment and effort of teacher educators as an example'* (T6).	*30/12*
C2 Video observation	*'Observing your own behaviour and that of colleagues and understanding what it means to them'* (T4). *'Creating and observing your own video case plus positive/constructive treatment in the programme'* (Tl0). *'Observing own video case and those of colleagues – how boring it is when you're too long-winded'* (T1l).	*13/9*
C3 Experiencing success	*'Students find it more challenging and get more feeling for the course content'* (T2). *'The fact that students become more active and that I can stand back and take some distance gives more confidence'* (T1l).	*8/7*
C4 Sharing experiences	*'Sharing of experiences; recognition'* (Tl0). *'Feedback from the peer group'* (T1l).	*9/7*
C5 Working on assignments	*'Working on the third competency test (course design) helped in thinking more conceptually'* (T6).	*10/7*
C6 Theory presented during the programme	*'Theory about lesson preparation'* (T5). *'Instruction about lectures: how much is forgotten!'* (T10).	*20/7*
C7 Personal meeting with teacher educator	*'Interview with teacher educator: naming strengths was stimulating'* (T1l).	*7/5*
Not interpretable		*-/-*

Figure 8. Logbook question C. Which programme characteristics where most helpful?

was that modelling by the teacher educator and the 'mirror' function of the course helped the teachers to experience what it was like to be students ('learning as a student: acting and experiencing', T10) and to better understand the consequences of teachers' actions. Partly for the same reason, observing and discussing their personal video cases or those of colleagues was considered to be instructive (C2), because it demonstrated how teaching behaviour works in practice:

Likewise, experiencing success in practice also helped the teachers to answer the 'what really works?' question (C3), and motivated the teachers to carry on:

> The fact that students become more active and that I can stand back and take some distance gives more confidence. (T10)

For seven teachers, sharing experiences in the course group and in the smaller peer groups in general (C4) was an important aspect of the teachers' learning process (C4).

Seven teachers reported that they learned a lot while working on their assignments and in particular the third assignment on (re)designing their own course, in which rethinking the assessment was an important part. Seven teachers were enthusiastic about all kinds of theoretical topics like learning styles, keeping attention during lectures, deep and surface learning and about the usefulness of models for designing and preparing lessons (C6). Five teachers reported that they benefited from the individual moments with the teacher educator (C7).

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5. Discussion and conclusions

5.1. Discussion

Our first research question was: what have our participants learned?

(1) Several teachers reported change in their teaching: they started to use more active teaching techniques and to organise and prepare their lessons in a more focused and decisive manner. Furthermore, most teachers changed their conceptions about the role of assessment. In particular the possibility of using more formative assessment forms to guide and support the learning process.
(2) The programme helped the teachers to deepen their conceptions about teaching and learning. Prior to participating in the programme, most of our teachers already showed student-oriented conceptions on some issues: teaching for vocational competencies, promoting student activity, the importance of teacher–student interaction and customised programmes. After the programme, however, these conceptions had deepened. While reflecting on these initial conceptions, most teachers reported being more strongly inclined to promote student activity and to make more use of teacher–student interaction than before the programme.
(3) The programme promoted better understanding of learning processes and more awareness of the teacher's role. Our results seem to indicate that above all, the programme helped our participants to understand the process of teaching and learning to a greater extent. They reported to be more aware of why and how they should use more active teaching techniques, promote more interaction and why it can be effective to resist the urge to cover all the content during the lessons. At the same time most teachers realised that there are still many challenges to overcome but indicated that they felt more confident about their future development as a teacher. So the programme seems to have had an 'empowering' effect on the participants.

Our second research question was: *How did our participants learn?*

Most teachers considered working on the course assignments and reading and discussing all kinds of theoretical notions as supportive. However, what was considered to be most instructive by the vast majority of the participants was to experience and discuss good practices during the course meetings and to observe and discuss video cases of themselves and of peers.

In short, three key principles seem to be important: (1) experiencing, (2) experimentation and (3) observation.

First, almost all participants emphasise the enriching effect of *experiencing* what it is like to be a student in the context of the course meeting, to experience new teaching techniques in both the student- and the teacher-role and to experience success in their own practice:

> I noticed on day 1 that [teacher educator] uses our names often (…) for me as a student that works really well. It makes me feel seen and made me active in class. I am also quick to learn students names but hardly used them. Now that I do it more often students have told me several times that they liked it. (T10)

For this experiential learning, the modelling by the teacher educator and the subsequent reflection were seen as pivotal.

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Second, *experimentation* seems to be another key principle. The teachers were stimulated to experiment with all kinds of pedagogical techniques such as group work, more interaction, quizzes, assignments to stimulate more self-study. It proved to be very encouraging if the techniques resulted in more engaged students, better learning results or more teaching pleasure.

Third, *observing* peers and themselves on video helped our teachers to develop a benchmark of what good teaching is. Although not all of these videos featured good practice, identification, personal relevance and being able to draw parallels to one's own personal situation, were all factors that made this a powerful learning experience. Perhaps one that is more credible than good written examples:

> observing video cases of peers. The others aren't perfect either, thank goodness! (T7)

The feedback they received on their own videotaped lessons provided strength and motivation to continue with this behaviour after the programme.

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5.2. Conclusions

The three key principles we mentioned above: experiencing, experimentation and observation have in common that they help novice teachers to translate what is learned in the programme into their own personal teaching practices. This seems to be in accordance with the line of thought in primary and secondary teacher education. The usefulness of the 'new' conceptions of teaching and learning must be 'proven to work' in educational practice and adjusted to fit the teachers' own personal contexts. Clearly, the expression 'guided re-invention' (Korthagen and Kessels 1999) seems to be very appropriate in this context. There really seems to be a continuing process of aligning concrete teaching experiences ('how it really can be done') with teaching conceptions ('how it should be done'). In this respect, the 'interconnected model of personal growth' (Clarke and Hollingsworth 2002) offers a useful framework for interpreting our research results. It shows a dynamic process of experimentation, discussion and reflection, in which theory and practice come together and in which teaching conceptions gradually depart from a somewhat abstract level and become integrated into teaching behaviour. We emphasise that for preparing novice teachers in higher education, this alignment of teaching theory and teaching practice may be very important, because there could be a risk that whilst induction programmes lead to a change at the conceptual level, this does not necessarily lead to changed educational practice (Murray and MacDonald 1997).

Furthermore, our research seems to nuance the idea that teachers start from a teacher focused conception in the first place. Most teachers are aware of the benefits of more teacher–student interaction and more active learning of their students, but often students are used to a more passive attitude and really have to be won over for a new way of learning (Weimer 2002). Possibly our teachers initially just lack the teaching techniques and the confidence to break through this resistance. So their student focused conceptions need to be fostered and made practical rather than induced.

Besides the role the three key principles play in translating teaching principles to personal teaching practices, we would like to stress the importance of the social context of the course group. Observing colleagues, comparing with colleagues, exchanging experiences, giving and receiving feedback in peer groups; all these learning activities support participants in becoming more confident about themselves as teachers. This

confidence is important to uphold the newly acquired insights and abilities in the unruly daily practice:

> What gives confidence is listening to the problems of (more experienced) colleagues and noticing that they meet the same pitfalls. (T4)

The results indicate that a shielded, classroom-like context in which teachers 'in the same boat' can share their concerns and experiences is an important factor for change. The above-mentioned design principles are contingent with an intensive programme in which ongoing exchange can occur and discussed with peers. Individualised induction programmes with a smaller role for teacher educators and peers, for instance, portfolio-based programmes would appear to be less suitable for the induction of teachers.

Finally, are our novice teachers ready to face the reality of a new student generation as stated in our introduction? The deepening of the learner-centred approach not only seems to lead to more confidence and skills but also leads to the 'evaporation' of certain concerns like dealing with diversity. We suspect that greater confidence and improved educational skills help to deal with diversity to such an extent that it leads to a diminished feeling of being unprepared to deal with the diverse population in the classroom.

5.3. Limitations and recommendations

Our study was based on the self-reports of 12 teachers, teaching at Dutch universities of applied sciences, in the context of just one induction programme. Generalising these results should be done only with care in at least two aspects.

To begin with, our study focused on teachers at universities of applied sciences. Most UAS teachers hold teaching-only positions and are able and motivated to try out the above-mentioned principles in their daily practices. By contrast, teachers at research universities have considerable research duties may have to be 'won over' to attend teacher induction programmes, as teaching might not be their first priority.

Another reason for caution is the research methods used. We assume that the design principles we recommend foster teacher empowerment and therefore a better retention of the programme results. Our study was based exclusively on self-reports by teachers. More elaborate research methods, such as class observations, and studies on a larger scale are needed to support our claims. Despite all this, we have attempted to raise our idiosyncratic experiences to a more general level by showing that our results do indeed tally with data from other areas of teacher education research.

Finally, much is demanded of the teacher educator in our recommendations for programme design. Acting as a model for adequate teaching behaviour, shaping a safe learning environment, promoting, organising and coaching reflection is indeed no sinecure. The professionalisation of teacher educators themselves seems to be a key issue and should form a distinct theme in teacher education (Murray and Male 2005).

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