
This is an electronic reprint of the original article.
This reprint may differ from the original in pagination and typographic detail.

Author(s): Clavert, Maria & Björklund, Tua & Nevgi, Anne
Title: Developing as a teacher in the fields of science and technology
Year: 2014
Version: Post print

Please cite the original version:

Clavert, Maria & Björklund, Tua & Nevgi, Anne. 2014. Developing as a teacher in the fields of science and technology. *Teaching in Higher Education*. Volume 19, Issue 6. 685-696. ISSN 1356-2517 (printed). DOI: 10.1080/13562517.2014.901957.

Rights: © 2014 Informa UK Limited. This is a post print manuscript of an article published by Informa UK Limited in *Teaching in Higher Education* (2014), available online at <http://www.tandfonline.com/doi/abs/10.1080/13562517.2014.901957#.Vd16oGO8omQ>.

All material supplied via Aaltodoc is protected by copyright and other intellectual property rights, and duplication or sale of all or part of any of the repository collections is not permitted, except that material may be duplicated by you for your research use or educational purposes in electronic or print form. You must obtain permission for any other use. Electronic or print copies may not be offered, whether for sale or otherwise to anyone who is not an authorised user.

Developing as a Teacher in the Fields of Science and Technology

In universities, development as a teacher may be contradicted with developing as a researcher. Most previous studies have investigated pedagogical development merely as a result of pedagogical training and ignored the dual teacher-researcher identity. This study examines what kind of meaningful experiences are perceived to have triggered and influenced the process of developing as a teacher in the fields of science and technology. The data were gathered by interviewing 10 academics that had participated in a pedagogical training offered by a Finnish technical university between 1999 and 2009. Based on a narrative analysis utilizing dimensions of transformative learning, the results highlight the influence of the working environment and experiences, and imply that teacher development process in the fields of science and technology can be better understood in terms of becoming a teacher, rather than as a continual, conscious development process. The resulting teacher-researcher identity provides a basis for pedagogical development.

Keywords: transformative learning; pedagogical development; engineering education; narrative approach

Introduction

When it comes to teaching in the scientific field, development as a teacher may be contradicted with developing as a researcher (Winberg 2008). In science and technology, as also in other academic fields and disciplines, teaching is often something that comes as a surprise for new academics (e.g. Knight 2002). They possess a doctoral education preparing them for acting as researchers in their own field of expertise, but most of them have no pedagogical education, pedagogical training, or previous teaching experience. Thus while the teachers-to-be are experts in their own field of study, they are novices as teachers and new to pedagogical thinking (Luedekke 2003). As a high proportion of faculty traditionally views teaching as a

transmission of knowledge, the novice teachers should be encouraged to reflect on their pedagogical thinking and be exposed to more effective, constructive conceptions (Ho 2000). In most universities, the academic reward systems are mainly based on research-based merits, such as the number of publications. According to previous studies, most university teachers value academic research over university teaching (Åkerlind 2005).

How do these academics then develop to be competent university teachers? Previous studies have investigated the process from the perspectives of how the teachers' approaches to teaching and student learning have developed and changed in pedagogical training (Gibbs & Coffey 2004; Postareff, Lindblom-Ylänne & Nevgi 2007, 2008; Postareff 2007; Hubball, Collins & Pratt 2005; Stes, Coertjens & van Petegem 2010) and what kind of effect pedagogical training has had on their teaching efficacy (Postareff, Lindblom-Ylänne & Nevgi 2007; Stes 2010). Development as a university teacher has also been explained with different phase models (e.g. Winberg 2008; Åkerlind 2003). Much of this research has based on a quantitative approach and focused on the effects of pedagogical training and changes in the teachers' actions. It has been questioned whether providing the teachers with prescribed skills and teaching recipes will produce conceptual development in their thinking about teaching and learning (Winberg 2008; Ho 2000). Thus in order to complement previous research, the present study adapts a narrative approach, constructing the subjective experience of developing as a university teacher. It examines what kind of meaningful experiences, as defined by the teachers themselves, are perceived to have triggered and influenced the process of developing as a university teacher.

In addition to adhering to a more objectivist framework, previous studies have tended to ignore the dual academic identity of being both a researcher and a teacher in

the university, though some attempts have been made (see e.g. Åkerlind 2011; Winberg 2008). Rather than examining mere actions, this study examines the development process as a process of learning that leads to a paradigmatic change in one's thinking. Learning is an experience of identity (Wenger 1998), and identity is formed in relation to cultural representations (Hall 1999; 1997). The identity of a university teacher is reflected in meanings, positioned in the language and narratives of culture. Because of the multiple, potentially contradictory, and not purely rational nature of the discourses constructing one's identity, the self cannot know itself independently of the meanings in which it is attached to. Meanings are portrayed in the reflection on experiences (Usher et al. 1997; Tennant 2009), and when certain meanings of a discourse are learned, thinking and doing change accordingly (Mezirow 2000). Because of the fragmented and changeable nature of identity, a holistic perspective for exploring the development of the technical teacher-researchers is called for (Hall 1999, 1997).

The process of learning new meanings through contradictions is conceptualized in the theory of transformative learning, which examines learning as a transformation in one's meaning perspective that consists of more specific meaning schemes. (Mezirow 2000.) One's identity is caught in these meanings as an ever changing self, discovered through reflection (Usher et al. 1997; Tennant 2009). Conceptual change requires confrontation followed by self-awareness, availability of alternative conceptions, and building commitment to a new conception (Ho 2000). Cognitive conflicts and contradictory practices force the learner to critically reflect on his or her existing perceptions of the world in order to find meanings more suitable to the surrounding environment and the experiences gained of it. (Mezirow 2000.) In addition to the cognitive elements of the transformative learning process, it also

includes emotional, social, contextual, and action related elements. The meaningful or critical experience of facing unfamiliar meanings and contradicting values and discourses can thus manifest in one or more of these divisions (Luoma 2009; Taylor 2000).

In this study, the meaningful experiences triggering scientific university teachers' teacher development are examined in the context of transformative learning theory. The change included in the development process of the teacher's identity is seen as a transformation in one's meaning perspective, as the old meaning schemes are critically reflected when facing a cognitive conflict, and replaced with more suitable ones, if needed. These meaningful transformation experiences are regarded as critical incidents (see Flanagan 1954). In addition to adopting a new, transformative learning approach to studying development as a university teacher, the study takes into account the two-fold role of a scientific university teacher both as a teacher and a researcher in exploring the nature and impact of meaningful events experienced by university teachers in the fields of science and technology related to teacher development.

Methodology

In order to investigate academics' development as university teachers, a narrative research approach was adopted (see e.g. Connelly and Clandinin 1990; Chase 2005; Webster & Mertova 2007). The construction of a narrative is selective and can vary according to the audience, the time of telling, and the following incidents (Polkinghorne 1995; Hatch & Wisniewski 1995). Nevertheless, as personally important incidents are more likely to stay in mind than less significant ones, the stories are likely to consist of critical incidents. As the incidents are often defined as

critical because of the retrospectively identified change they have generated, collecting stories from the past is justified (Webster & Mertova 2007; see also Flanagan 1954). Also, as the approach highlights the unique experience of an individual rather than aims at generalization, the number of the stories does not affect the validity of the study. Any story also reflects the shared social, cultural, and historical circumstances that enable and constrain its narration. (Chase 2005.)

Context of the study

The study was conducted in a Finnish technical university, consisting of approximately 3 300 staff and 15 000 student members. Neither pedagogical training nor previous teaching experience is required from the teaching faculty, but such training programmes have been available since 1999. At the time of this study, the main pedagogical training programme available to the staff of the university took in 20 to 25 participants every half-a-year. Every department was expected to send four new teachers to the training every year. While the programme of 20 ECTS credits varied in its structure, educators, and content during its existence between 1999 and 2009, the principles of communality, student-orientation, and practicality were consistent during the years.

Participants

The data of this study were gathered by interviewing 10 academics that had attended pedagogical training offered by the university in different academic years between 1999 and 2009. The participants were on teaching and research appointments of the university – four of them were researchers, two were assistants, two university teachers, one was a lecturer, and one a professor. The distribution was even across departments and gender. The length of their teaching careers at the moment of the

interview varied from seven to 20 years. In order to protect the identity of the interviewees, their specific background information is not disclosed, and they were assigned pseudonyms in the analysis.

Data production

The data were collected adapting a narrative and biographic approach (see Dominicé 1990; Hatch & Wisniewski 1995). The data collection methods and the questions were tested in three pilot interviews. In the beginning of the narrative interview, the interviewees were asked to draw a lifeline (see e.g. Cermák 2004) to describe their trajectories of becoming a teacher. They were asked to mark the important and meaningful events, experiences or achievements on the lifeline. The interviewer asked the participants to describe how they had become teachers and describe in-depth the meaningful experiences of becoming a teacher. Unstructured follow-up questions were used to encourage the teachers to reflect on their experiences further or to check the meaning of the concepts or words they had used in their teacher development stories. The first author conducted and transcribed all of the interviews.

Analyses

Based on each interview, a core narrative was constructed by the first author. The interviewees were given a chance to comment on and change these core narratives, thus validating the interpretation and minimizing the risk of the researcher-constructed narratives taking on a life of their own and becoming dissociated from the tellers' intents (see Polkinghorne 1995). The interviewees requested no significant changes to the narratives. The units of analysis were defined as the critical, discreet, separate incidents with a storyline. Other general reflections such as "I've always been interested in..." were seen as important to the coherence of the core narratives,

but were excluded from the thematic analysis. The detailed descriptions related to participating to the main pedagogical training programme offered by the university were excluded from the analysis of the core narratives due to being analyzed elsewhere (see Clavert & Nevgi 2011).

The core narratives were content analyzed by applying the cognitive, emotional, social, contextual, and action related dimensions of transformative learning (see Mezirow 1991). Taking into account the overlapping character of the transformative learning dimensions, some incident descriptions were allocated to multiple categories due to their multiple meanings. After constructing the main categories, the sub-categories were constructed according to the thematic similarity of the units of analysis. The robustness of the coding schemes were checked by having an independent reviewer re-code two of the ten core narratives, excluding any units that had been allocated to more than one category. Inter-rater agreement was calculated using Cohen's Kappa ($k=0.92$), and was deemed to be sufficient. The results of the re-coding indicate that the interpretations made in the coding process were systematic and that the categorization decisions were reasonable.

Results

In the core narratives, the total of 107 meaningful teacher development events were identified. These were categorized as meaningful transformative teacher development events in terms of 1) pedagogical actions, 2) social context, 3) emotions, 4) cognitions and 5) the context of teaching and learning. Each category had one to six subcategories, and the distribution across the categories and subcategories is illustrated in Table 1. After first examining the overall development path, the content of the categories is reported in more detail. In order to protect the anonymity of the

interviewees, their names are replaced with pseudonyms.

[Insert Table 1 near here]

The overall path of becoming a university teacher

Even though all teachers mentioned participating in pedagogical training as a part of developing as a teacher, eight teachers also emphasized the importance of the relationships with their students, and four with their colleagues. Seven teachers talked about their teaching experiences as novice teachers, and six of the teachers described the attempts to improve their teaching as well as the experiences of especially good or poor teachers they had themselves had as students. Five interviewees reported beginning their teaching careers as course assistants, using ready-made teaching materials, and teaching the way they had themselves been taught during their university studies. Even though the interviewees described their teaching career to begin from the first official teaching experience, they did not initially identify themselves as teachers. For example, one interviewee described teaching initially as something that had to be done when research could not be funded otherwise, identifying herself as a researcher who is forced to teach rather than a teacher:

”Even when [I started actually teaching], teaching was just a secondary job that could be done alongside research, it sort of provided my pay initially as I didn’t have a proper research funding.” (Vuokko)

Seven of the ten interviewees reported identifying themselves as teachers much after beginning their teaching careers, for example after facing difficulties in their teaching, or being exposed to contradicting pedagogical thoughts, values, or interesting opportunities resulting from, for example, attendance to pedagogical training, teaching development efforts, or collegial collaboration. Seven interviewees

described becoming more enthusiastic towards pedagogical development work after identifying themselves as teachers, as well as getting more freedom and responsibility at a later phase of their career. For example, one interviewee reported regret over not being able to experience herself as a teacher earlier during her career of teaching. For her, the participation in pedagogical training later in her career functioned as a triggering event in identifying herself as a teacher and beginning to develop the pedagogical side of her work:

”The most big thing for me actually was that I went to [the main pedagogical training programme offered by the university], I think that was where, so late, I realized that this is how I want to teach, it changed my understanding of being a teacher, and I think it’s a pity that I didn’t have such an opportunity earlier on, as I would have had all of the prospects of being a good teacher then - - it’s such a pity I think that “teacherhood” is born so late, at least for me, and only now do I have the experience and approach that I am certain that one can teach differently, it could have become much earlier, but I would have needed, if you think of when the pedagogical training should have been, I should have received it when I came to work at [the university].” (Inkeri)

Category 1: Meaningful teacher development events in pedagogical actions

The most numerous category in the narratives of developing as a university teacher was the meaningful events in pedagogical actions, containing a total of 40 units. The category was divided into five types of events; participating in pedagogical training, teaching, developing teaching, ending up as a university teacher, and studying (see Table 1). The themes of participating in pedagogical training, teaching, and developing one’s teaching were most common and were found in all of the narratives.

All interviewees mentioned participation in pedagogical training as a meaningful event for their development as a teacher. Eight of the ten teachers described the experience of participation as gaining pedagogical understanding and

identifying a need for pedagogical development. However, only four interviewees reported critically reflecting on their pedagogical assumptions after the training. Teaching in general was mentioned in seven interviews. The teachers described teaching, for example, their younger siblings, classmates, and friends in their spare time, as well as working as teaching assistants and university teachers at the university. Six teachers mentioned pedagogical development efforts conducted after the pedagogical training and targeted towards more student-oriented teaching. Even though not determined as a starting point of the process of developing as a teacher, five teachers also described the experience of ending up teaching at the university as a meaningful incident. Two teachers saw further studying besides working as having a positive supporting effect in developing their teaching. In the following quotation, the interviewee describes how he was offered a teaching assistant position after participating in an interesting course:

“I was on a [course name] course here, and the teacher asked - - if I wanted a summer job here at their department - - before I started the summer job, another person called from the lab and asked, having received my contact information from the person that had offered me the summer job when asking around for an assistant for a lab course, - - if I was interested in taking the position. Apparently the criterion had been to hire some enthusiastic young person (laughs), and so I started in my first real official teaching position.” (Leevi)

Category 2: Socially meaningful events

Socially meaningful incidents were the second most numerous category, containing a total of 28 events. These events were divided into the four subcategories of teaching models, contact with students, the attitude of the students towards teaching, and collaboration with other teachers (see Table 1). Five of the teachers began their stories by describing their memories of positive role models in teaching as well as

examples of poor teachers. They reflected on the influence of those teachers on their own teaching, and compared them with other teachers. Five interviewees also reflected on the meaning of being in contact with the students. Having a personal relationship with the students was deemed important in making the teaching experience rewarding. Also six teachers reported that the way the students react to teaching and to the varying teaching development efforts influences the future development process as a teacher.

In addition to the personal relationship with the students, the opportunity for pedagogical collaboration with colleagues shaped the development process of three of the interviewees. For example, one interviewee described his exceptionally passionate mathematics teacher:

”I had a really good math teacher when I started at [the university], very inspiring, didn’t have, only had a small, palm-sized piece of paper with him and did two hours so, in almost in an ecstasy.” (Viljo)

Category 3: Emotionally meaningful events

22 events were meaningful in terms of the emotions they awakened, namely disappointment, satisfaction, increasing enthusiasm, decreasing enthusiasm, courage and thrill (see Table 1). Positive and negative feelings were reported in approximately equal amounts.

Five teachers reported events filled with disappointment, such as being afraid or too distressed to teach, regretting one’s decisions, or being disappointed with one’s role models. For example, the interviewee regrets rejecting an opportunity to teach a large course in an early stage of her career:

”I made a terrible mistake, I was offered the chance to lecture to 500 students, but back then I thought that I can’t lecture as I hadn’t graduated, and then they

got just some researcher that wasn't particularly interested in the topic to give the lecture, and then I realized this was my mistake, I should have went to the lecture theatre, I would have given a much better lecture and even enjoyed it, the other person had just been ordered to as someone had to give it. That is a mistake I have regretted afterwards, even though now I have been able to give lectures at lecture halls, but I should have done it then, younger." (Paula)

In addition to disappointment, two of the teachers mentioned declining enthusiasm resulting from getting fed up with teaching and becoming aware of the overwhelming requirements of good teaching after pedagogical training.

On the other hand, four interviewees reported events of satisfaction related to, for example, facilitating people, succeeding in pedagogical development efforts, or gaining membership to a like-minded community. Three teachers described feelings of increasing enthusiasm when getting more pedagogical responsibility, developing their teaching successfully, and adopting a new pedagogical approach to one's work. Also the feelings of gaining bravery to reform one's teaching after participating in pedagogical training and thrill when facing large student groups for the first time were central to two of the development incidents.

Category 4: Cognitively meaningful events

In addition to having strong emotional effects, many critical development incidents included cognitive changes as well. A total of 15 cognitively meaningful events were divided between understanding the need for pedagogical development, increasing understanding of one's own teaching, and understanding one's willingness to teach (see Table 1). The experience of realizing the need for reforming one's teaching was mentioned as a cognitively meaningful transformative learning event in the core narratives of four teachers. The understanding resulted often from changes in one's teaching environment, facing problems with teaching, gaining more pedagogical

responsibility, or from participating in pedagogical training or other development activity. In addition, three teachers described gaining better overall understanding of their teaching. Understanding one's own willingness to teach was mentioned by three teachers and manifested in prioritizing the role of teaching in one's work, rather than treating it as an obligatory task, secondary to research. The understanding was often gained while taking a break from teaching, when the teaching environment was changed, or after developing one's teaching actively due to participating in pedagogical training. In the following quote, the teacher describes how his understanding of the pedagogical development need increased after a teaching experimentation on his course:

”And then it of course influences also, I have tried to think of how to fix this in teaching, what could be done about it so that it wouldn't be like this, because it feels like the course cannot be made easier just to make it easy to pass for them, it shouldn't happen at the expense of the content, the teaching, or primarily improving the thresholds for pass.” (Sakari)

Category 5: Contextually meaningful events

Finally, the two contextually meaningful incidents of developing as a teacher reported by the interviewees were related to the attitudes of the academic community towards pedagogical development. One interviewee described how she absorbed the negative pedagogical atmosphere of the surrounding community. She felt it was easier to adopt the shared passive development attitude rather than try making changes to her teaching. On the other hand, another interviewee reported participating in pedagogical development actions as a result of her colleagues' positive pedagogical development attitude. She describes her discovery of the pedagogical development action organized at her department as follows:

“My first awakening towards teaching came from the department’s TD [teaching development] activity, that was actually more or less headed by [my senior colleague], - - we had a common coffee room, we were from different research groups but had our lunch at the same place, and so of course the discussion spread a bit, that oh, we have this TD day, - - and then [another colleague] had also participated in [the main pedagogical training programme offered by the university] with [the senior colleague], and [the other colleague] in turn was from the same group that I was, so there was the example of the more experienced people.” (Vuokko)

Discussion

Exploring what kind of meaningful experiences university teachers in the fields of science and technology attach to their teacher development process, meaningful events were found related to pedagogical activities, social aspects, emotions, cognitive changes, and contextual issues, alike. In the beginning of their teaching careers, the participants of the present study described teaching as something that had to be done alongside research, identifying themselves as researchers. The participants’ teacher identity was not related to progress in their teaching career, instead, they started to see themselves as teachers only after some critical, meaningful event challenged the meanings that had previously been attached to being an academic and a teacher. The triggering events could take the form of facing difficulties in teaching, being exposed to contradicting pedagogical thoughts, or gaining access to interesting opportunities through attendance to pedagogical training, teaching development efforts, or collegial collaboration. Only after identifying themselves as teachers did the participants report becoming interested in pedagogical development. The teacher development process was thus described more in terms of becoming a university teacher, rather than as a continual, conscious development

process starting from the first official teaching experience.

There seems to exist a division between "us researchers" and "the others" amongst those technical university teachers who identify themselves primarily as researchers and those who identify themselves more as teachers. As suggested by Hall (1997, 1999) and Bauman (1996), these opposite positions can be strengthened by attaching stereotypical attributes and confrontational values to them. Whilst still identifying primarily as researchers, resistance to pedagogical development ideas and efforts can be seen as resistance to an experienced threat to one's identity triggered by unfamiliar meanings and contradicting values (Wenger 1998). This contradiction is typical for the fields of science and technology due to the fundamental differences between the technical and education disciplines in, for example, how knowledge is produced and taught to others (Winberg 2008). Consequently, the teachers might be drawn to protect their disciplinary identities. Only overcoming the threat enables university teachers to critically reflect on their meaning perspectives and seek for alternative pedagogical concepts and social relations on which to base their identities as a teacher (Mezirow 1990; Ho 2000). While all of the teachers in the present study had already adopted a teaching identity, only four reported critically reflecting on their basic assumptions of their role as a teacher, their teaching, and pedagogy. As the teachers had somewhat similar backgrounds, experiences, attitudes and values, it might have been challenging for them to critically reflect on their sociocultural environment (Mälkki 2010; Taylor 2000; Mezirow 1991) – indeed, critical reflection occurs most likely in a heterogeneous environment that is resilient and open to diverse perspectives.

Previous studies have identified pedagogical training as a source of development for university teachers' pedagogical awareness and thinking, as well as

providing teachers with a deeper understanding and new perspectives of teaching (Postareff et al. 2007; Nevgi et al. 2007; Stes, Coertjens & van Petegem 2010). In this study, reflection of teaching frequently resulted also from changes in one's teaching environment, facing problems with teaching, gaining more pedagogical responsibility, taking a break from teaching, and developing one's teaching. The teachers began to reflect on their teaching when their coexisting beliefs and values within the theories-in-use became incompatible due to, for example, increased freedom and responsibility in developing one's teaching. The teachers' reflection resulted in understanding the need for pedagogical development as well as an improved understanding of one's own teaching and willingness to teach.

In order to critically reflect on their pedagogical beliefs, values, and assumptions, strong emotional experiences related to teaching were required amongst the teachers of this study. The results also confirm the previous research findings on the centrality of a conceptual confrontation in developing as a teacher (see e.g. Ho 2000). Powerful personal experiences, as suggested by Taylor (2000) and Mezirow (2000), encourage the teachers to seek for more effective pedagogical meanings. According to Ho (2000), lack of congruence between the daily pedagogical theories-in-use and the high-level espoused theories learnt in pedagogical training results in feelings of confusion, critical reflection, and understanding of the development needs. In this study, most conflicts originated from difficulties to achieve intended pedagogical goals, such as motivating students to learn. In fact, pedagogical training was most effective with teachers who had encountered difficulties in their teaching before entering the training and were open to alternative pedagogical concepts. Those teachers were also most consistent in changing their teaching practices after taking part in pedagogical training.

As one's identity is based on the social acceptance among the people one values, it is both critical and satisfying for a teacher-researcher to find a social peer group that considers the new pedagogical ideas as important (Mälkki 2010; Taylor 2000). Possessing multiple memberships between the academic research community and the pedagogical community of active teachers enables developing a mutually reinforcing teacher-researcher identity and critically reflecting between the common conceptions of the two communities (Wenger 1998; Winberg, 2008). Indeed, the teachers in the present study emphasized the importance of the permissive attitudes of their colleagues, students and supervisors in the process of questioning commonly shared pedagogical meanings and developing themselves as teachers without losing social acceptance. As stated by Ho (2000) and Guskey (2002), building commitment to the new conceptions was seen as dependent on experimenting with new pedagogical ideas and the resulting reactions of colleagues and students. Without gaining support from the academic peer community and perceiving concrete positive effects in student learning resulting from acting according to the new conceptions, the development efforts were easily ceased. According to Mezirow (2000), acting differently completes the transformative learning process. In brief, the effects of pedagogical training are dependent not only on the previous experiences of the teacher, but also of the subsequent attitudes and reactions of the surrounding academic community.

Conclusions

The results imply that research of pedagogical development as well as teacher training programmes might benefit from a narrative, holistic approach that takes into account the wide range of pedagogical reflection triggers reported in this study. Understanding the initial pedagogical development process as becoming a teacher

highlights the need for raising contextual and cultural awareness of the pedagogical theories-in-use in the fields of science and technology. In order to support the transformation, pedagogical training programmes should be more participant-oriented, context-aware, and dispersed in time and place. Providing teachers with a pedagogical community that enables safe experimentations with their teacher identities can target the challenge posed by the dual-identity of university teacher-researchers. Further research is needed to investigate how becoming a teacher can be supported on a community level.

References

- Bauman, Z. 1996. From Pilgrim to Tourist - or a Short History of Identity. In *Questions of Cultural Identity*, eds. S. Hall & P. du Gay, 18-36. London: Sage Publications.
- Chase, S. 2005. Narrative Inquiry. Multiple Lenses, Approaches, Voices. Chapter 25 in *The Sage Handbook of Qualitative Research*, eds. N. Denzin & Y. Lincoln, 651–679. Sage Publications: California.
- Clavert, M. & Nevgi, A. 2011. Yliopistopedagogisen Koulutuksen Merkitys Yliopisto-opettajana Kehittymisen Kokemuksessa [The Role of Universities' Pedagogical Training in the Experience of Developing as a University Teacher]. *Peda-Forum* 11 (2): 6-16.
- Cermák, I. 2004. “Genres” of Life-Stories. In *Narrative, Memory & Identity: Theoretical and Methodological Issues*, eds. D. Robinson, C. Horrocks, N. Kelly, & B. Roberts, 211-221. Huddersfield: University of Huddersfield.
- Connelly, F. & Clandinin, D. 1990. Stories of Experience and Narrative Inquiry. *Educational Researcher* 19 (5): 2–14.
- Dominicé, P. 1990. Composing Education Biographies: Group Reflection Through Life Histories. Chapter 10 in *Fostering Critical Reflection in Adulthood: A Guide to Transformative and Emancipatory Learning*, eds. J. Mezirow & associates, 194-212. Jossey-Bass Inc: San Francisco.

- Flanagan, J. 1954. The Critical Incident Technique. *Psychological Bulletin*, 51 (4): 327–358.
- Gibbs, G. & Coffey, M. 2004. The Impact of Training of University Teachers on Their Teaching Skills, Their Approach to Teaching and the Approach to Learning of Their Students. *Active Learning in Higher Education* 5 (1): 87-100.
- Guskey, T. 2002. Professional Development and Teacher Change. *Teachers and Teaching: Theory and Practice*, 8 (3): 381-391.
- Hall, S. 1999. *Identiteetti*, Tampere: Vastapaino.
- Hall, S. 1997. The Work of Representation. In *Representation: Cultural Representations and Signifying Practices*, ed. S. Hall, 13-74. London: Sage Publications Limited.
- Hatch, J. & Wisniewski, R. 1995. Life History and Narrative: Questions, Issues, and Exemplary Works. In *Life History and Narrative*, eds. J. Hatch & R. Wisniewski, 113-136. London: The Falmer Press.
- Ho, A. 2000. A Conceptual Change Approach to Staff Development: A Model for Programme Design. *The International Journal of Academic Development*, 5 (1): 30-41.
- Hubball, H., Collins, J. & Pratt, D. 2005. Enhancing Reflective Teaching Practices: Implications for Faculty Development Programs. *Canadian Journal of Higher Education*, 35 (3): 57-81.
- Knight, P. 2002. *Being a Teacher in Higher Education*. Buckingham: Society for Research in Higher Education and the Open University Press.
- Lueddeke, G. 2003. Professionalising Teaching Practice in Higher Education: A Study of Disciplinary Variation and 'Teacher-Scholarship'. *Studies in Higher Education*, 28 (2): 213-228.
- Luoma, K. 2009. Theorizing the Challenges of Reflection. Two-Layer Tension Formulation Disclosing the Emotional and Social Dimensions. (submitted)
- Mezirow, J. 2000. Learning to Think Like an Adult: Core Concepts of Transformation Theory. Chapter 1 in *Learning as Transformation. Critical Perspectives on a Theory in Progress*, eds. J. Mezirow, J. & associates, 3-33 San Francisco: Jossey-Bass.
- Mezirow, J. 1991. *Transformative Dimensions of Adult Learning*. San Francisco: Jossey-Bass.

- Mezirow, J. 1990. How Critical Reflection Triggers Transformative Learning. Chapter 1 in *Fostering Critical Reflection in Adulthood: A Guide to Transformative and Emancipatory Learning*, eds. Mezirow J. & associates, 1-20. Jossey-Bass Inc: San Francisco.
- Mälkki, K. 2010. Building on Mezirow's Theory of Transformative Learning: Theorizing the Challenges to Reflection. *Journal of Transformative Education*, 8 (1): 42-62.
- Nevgi, A., Postareff, L., Räisänen, M. & Tuononen, T. 2007. University Teachers' Descriptions of the Meaning of Instructional Development Courses. A poster presented at the 13th Biennial Conference for EARLI, Amsterdam, Netherlands, 25th–29th of August 2009.
- Polkinghorne, D. 1995. Narrative Configuration in Qualitative Analysis. Chapter 1 in *Life History and Narrative*, eds. J. Hatch & R. Wisniewski, 5-23. London: Falmer Press.
- Postareff, L., Lindblom-Ylänne, S. & Nevgi, A. 2008. A Follow-up Study of the Effect of Pedagogical Training on Teaching in Higher Education. *Higher Education*, 56 (1): 29-43.
- Postareff, L., Lindblom-Ylänne, S. & Nevgi, A. 2007. The Effect of Pedagogical Training on Teaching in Higher Education. *Teaching and Teacher Education*, 23 (5): 557-571.
- Postareff, L. 2007. *Teaching in Higher Education: From Content-Focused to Learning-Focused Approaches to Teaching*. Department of Education, University of Helsinki. Doctoral dissertation.
- Stes, A., Coertjens, L., & Van Petegem, P. 2010. Instructional Development for Teachers in Higher Education: Impact on Teaching Approach. *Higher Education*, 60 (2): 187-204.
- Stes, A., Min-Leliveld, M., Gijbels, D., & Van Petegem, P. 2010. The Impact of Instructional Development in Higher Education: The State-of-the-art of the Research. *Educational Research Review*, 5 (1): 25-49.
- Tennant, M. 2009. Lifelong Learning as a Technology of the Self. Chapter 10 in *Contemporary Theories of Learning: Learning Theorists... in Their own Words*, ed. K. Illeris, 147-158. London: Routledge: 147-158.

- Taylor, E. 2000. Analyzing Research on Transformative Learning Theory. In *Learning as Transformation. Critical Perspectives on a Theory in Progress*, eds. J. Mezirow & associates, 285-328. San Francisco: Jossey-Bass.
- Usher, R., Bryant, I., & Johnston, R. 1997. *Adult Education and the Postmodern Challenge*. London: Routledge.
- Webster, L. & Mertova, P. 2007. *Using Narrative Inquiry as a Research Method. An Introduction to Using Critical Event Narrative Analysis in Research on Learning and Teaching*. New York: Routledge.
- Wenger, E. 1998. *Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press.
- Winberg, C. 2008. Teaching Engineering/Engineering Teaching: Interdisciplinary Collaboration and the Construction of Academic Identities. *Teaching in Higher Education*, 13 (3): 353–367.
- Åkerlind, G. 2011. Separating the ‘Teaching’ from the ‘Academic’: Possible Unintended Consequences, *Teaching in Higher Education*, 16 (2): 183-195.
- Åkerlind, G. 2005. Academic Growth and Development - How do University Academics Experience it? *Higher Education*, 50 (1): 1-32.
- Åkerlind, G. 2003. Growing and Developing as a University Teacher - Variation in Meaning. *Studies in Higher Education*, 28 (4): 375-390.