
THE MODIFICATION OF SUBJECTIVE THEORIES WITH VIENNESE TEACHER TRAINEES: RESULTS FROM A TWO- YEAR STUDY BETWEEN THE FIRST AND THE FOURTH SEMESTER OF STUDY

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Abstract: *Following Shulman and Bromme a lot of attention was paid in the 1990s to the “hidden knowledge in teaching practice” – above all in the scientific disciplines. The investigation under discussion, carried out at the State College of Education Vienna (now the University of Education Vienna), is to be seen as an attempt to identify possible modifications of subjective theories with teacher trainees in the course of study for future lower secondary teachers over a period of four semesters of study. Teachers’ subjective theories are understood in such a way that their thinking can be considered an implicit theory which is relatively stable, structured, and influences their behaviour; teacher trainees, however, may reveal different findings. The main results of the analysis are: modifications of the perception of the students’ own role (from students to teachers) in connection with self-related cognitions and self-efficacy, the perception of the child, that is the perception of the child in his/her role as a pupil; teaching issues in connection with the student’s own role as a teacher as well as the pressure to act in critical situations, and their increasing realization of the teacher’s job of bringing up children as well as a shift in the view of the schools’ mission from mere cognitive learning to social learning.*

Key words: *subjective theories, teacher education, teaching practice, long-term study, self-related cognitions, self-efficacy, perception of the child/the pupil*

Theoretical positioning

Teacher students⁴ professionalize themselves by producing their own patterns of perception and knowledge components in the course of testing their first skills. It seems that the constellation in which these patterns of perception are acquired is of particular importance. If these patterns of perception are acquired without scientific reflection, then skills and knowledge come into being that may be professionally typical, but not justifiable in relation to a professional science of teaching.

4 Student/s is used when talking about teacher trainees; pupils is used with reference to the ten-to-fourteen-year-olds in class.

In the context of the expert-novice paradigm the implicit knowledge of experts, the routines, are of great significance. What is meant here is knowledge that can be used in new contexts, even though this knowledge often cannot be explained.

Discussing routines one comes upon concepts such as "tacit knowledge" (Polanyi, 1967), "knowing how" (Ryle, 1949), "knowing in action" (Schön, 1983), "intuitive action" ("intuitives Handeln"; Dreyfus & Dreyfus, 1987) and "tacit knowledge" (Bromme, 1992).

In relation to the professionalization of teachers the emergence of routines is not irrelevant: routines may develop from imitation of a model; the actions carried out in this context, however, may not have been the subject of the teacher's attention. Rules carried over from such patterns of activity cannot or can hardly be verbalized, as the adoption remains unconscious. This assumption involves a massive objection to forms of "teaching practice" that see themselves as a trade, rather than theory-based elements of curricula (see Haider, 2000).

Routines, however, also arise when learners pay attention to new patterns of activity while learning; in such cases they are able to verbalize the rules they followed (see Seebauer, 2006, p. 21ff.).

In this context the self-efficacy of teacher trainees is of special importance. Following the basic statements of the theory of self-efficacy (among others Bandura, 1997), we learn that psychological changes and changes in behaviour are conveyed through a change in judging one's personal skills and by the expectation of future personal effectiveness. Self-related cognitions of this kind set cognitive, affective and motivational processes in train – as to the implementation of knowledge and skills in action – and control them. Together with the expectation that a certain action will result in a particular outcome (expectation of contingency) such self-related cognitions exert a significant role in the regulation of self.

When discussing teacher education such expectations of self-efficacy are of interest – to the effect that through expectations of self-efficacy the teacher's (teacher trainee's) optimistic conviction is or may be expressed that they will be provided with the necessary resources to handle difficult situations.

According to Bandura (1997) the objective resources are not in the foreground in such cases, but the belief in them is: "Perceived self-efficacy is concerned not with the number of skills you have, but with what you believe you can do with what you have under a variety of circumstances" (Bandura, 1997, p. 37). These beliefs are followed by multiple consequences – they determine motivation, emotions and behaviour. According to Bandura (1997) the conviction to be able to use skills practically – besides the skills, of course – forms a prerequisite for the successful mastering of complex demands: "Effective functioning requires both skills and then efficacy beliefs to use them" (Bandura, 1997, p. 36).

Various publications (see Schwarzer & Schmitz, 1999; Schwarzer & Jerusalem, 2001) even suggest that people with high efficacy judge their chances of success with problems that objectively can't be solved, and with which they have had no experience, higher than people with a lower degree of efficacy: they try very hard to get a solution and are less frustrated by failures.

In view of the study presented here it can be assumed that teacher trainees with high self-efficacy also express their self-efficacy verbally (in a projective way, with self-references in their statements) and that there is an increase in self-efficacy between the beginning of their course of study in the first semester and the end of the fourth semester (end of the investigation period).

Targets of the investigation and the concrete problems

This study focuses on changes in the subjective theories of teacher trainees from the beginning of the first to the end of the fourth semester (three survey phases); the following categories (see Shulman, 1986; Bromme, 1992) of changes will be examined:

Bromme (1992) following Shulman (1986)	Categories adapted for this study:
subject matter knowledge	Knowledge about the subject* (2 Items**)
curricular knowledge	Knowledge about general goals/objectives (2 Items). Teaching aids (2 Items)
general pedagogical knowledge	Knowledge about pupils (1 Item) Knowledge about other factors that influence pupils (parents, peers, etc.) (2 Items)
pedagogical content knowledge/„blending of content and pedagogy“	Knowledge about classroom management (2 Items)

The following questions have been formulated against the background of this concept:

1. What are the characteristics of the subjective theories of the teacher trainees (total sample) at the beginning of the first semester, at the end of the second and at the end of the fourth semester in terms of the following categories: knowledge about the subject, knowledge of general goals/objectives, teaching resources, knowledge of the pupils – of factors that influence pupils (parents, peers, etc.) – knowledge of classroom management?
2. Do the subjective theories of the teacher trainees reveal any changes from the beginning of the first to the end of the fourth semester of study? – If so, what kind of changes are these (quantitative/qualitative)?

* Bromme generally uses the term „Wissen“ for „knowledge“; in current terminology we would use „competence“ in this case.

** The Items contributing to the four categories refer to the survey material called Completing sentences (see chapter Description of the survey material and methodology).

3. Do the subjective theories – with progressive study experience (practical experience) – increasingly prove the prospective teachers as players?

Description of the survey material and methodology

Data were collected in written form, by means of projective techniques (projection of partly conscious, partly unconscious thoughts, ideas, values, desires). The projective technique was chosen to avoid the effects of test management (rationalizations and cognitive control).

The following techniques were applied (for details see: Seebauer, 2008):

- *Completing sentences* (11 sentences, contributing to the categories as described above, and
- *Mind Mapping* of the terms *school, education, tuition/teaching*, which allow a visualization of the elements of knowledge, of the underlying knowledge structures and knowledge systems.

A frequency analysis of the notions that were associated with *school, education, tuition/teaching* was carried out and as a follow-up the notions were categorized (e.g. characteristics/features/functions of school/of education/of teaching – players – characteristics of the players – actions of the players...). The texts (from the subtest *Completing sentences*) were ascribed to the respective categories, analysed quantitatively and visualized; examples typical for each of the categories were listed. Particular subcategories (e.g. should-statements, teaching resources, educational/ methodological issues, actions/ activities of the pupils) were dealt with in the knowledge categories. To answer question 3 the “direct surrounding of the text worthy of interpretation” (Mayring, 2002, 118)⁵ was the focus of consideration. The text was scrutinized with the help of the search function of MS-Word[®] and with the help of TextSTAT 1.52, a concordance program by Matthias Hüning (freeware, Free University Berlin).

Characterization of the sample

The survey was carried out on a group of teacher trainees in the course of study for future lower secondary teachers over a period of four semesters of study (English as a first subject) following the curriculum 2004 to 2007.

In the first survey and in the second round (October 2004 to June 2005) 28 students took part (7 male, 21 female); because of students taking a semester abroad, changing to other institutions or dropping out, there were just 20 students available for the third survey.

⁵ In the original language: „...direkte[s] Textumfeld der interpretationsbedürftigen Stellen“.

Summary and interpretation of results

The presentation of the results⁶ follows the categorization according to Shulman and Bromme as described above.

• **Goals / Objectives**

Transfer of knowledge/transfer of knowledge of a subject is regarded as the most important task of the school by college entrants, and at the same time knowledge (of a subject) is what the school should provide the children with.

The subjective theories of the college entrants seem to be fed by experience gained from upper secondary schools (general stream, vocational stream) and are projectively reflected.

Changes – at the end of the first semester of study – are being reflected in such a way that social behaviour/social skills (in the broadest sense) are regarded as more important.

The importance of teamwork and manners (good behaviour) are articulated as further tasks of the school, which can be explained by increasing school experience – in the sense that deficits observed are being reworded as “a task of the school”.

Further experience – picked up during the experience of “practical studies/teaching practice” in the second academic year – complements the range of what schools should impart: neat appearance, politeness, orderliness, punctuality, positive attitude to work, etc. It is assumed that in classes in which the students could observe these properties in the children, teaching and learning proved to be more successful than in classes in which the absence of these properties was observed.

Preparing for life – as *the* task of the school – is regarded as being of great importance even in the first semester and increases with the progression of studies as revealed by the frequency of the students’ statements.

Teaching multicultural classes in Vienna – until the end of the second academic year – brings about a further change in the perception of the role of the school: tolerance/ acceptance of people of other origins gains significant importance.

• **Teaching resources**

Media – throughout the total investigation period – are ascribed great importance.

While the college entrants stress the importance of media in relation to the children or pupils (“Students learn easily by means of various media”; “... so that all students are addressed, and not just those who learn well acoustically ...”), the statements of students at the end of the second semester link the use of media with their own teaching

⁶ For reasons of clarity the results will be presented according to the categorization of Shulman and Bromme. The reader will be fully provided with the answers to the research questions as formulated in chapter 2 without explicitly referring to them.

(“...teaching in an entertaining, interesting way”; “inspiring tools that grind the classroom”; “variety in teaching ...”). Only at the end of the fourth semester of study do the statements of the students address the use of media as didactic components – for example, that “these are useful and should be applied in various ways”; “... media should not demand too much of the children”; “...should be adjusted to the children ...”.

The analysis of Mind Maps (stimulus word “tuition/teaching”) suggests a narrowing regarding the possibilities of the use of media. While the college entrants at the beginning of the first semester named twelve different media (projector, CDs, slides, film, etc.), the number of media decreases at the end of the fourth semester of study: worksheets, real objects, overhead projector, posters, videos and blackboard – in other words, those teaching aids are listed that actually were used or were available in the classes. Textbooks are ascribed the function of “guide, support, assistance, guidance”, with increasing importance of these aspects between the first and fourth semesters.

While college entrants consider textbooks to be a means for reading, for repetition, etc, students in the fourth semester increasingly criticise the textbooks (partially not useful, useless...).

At the end of the fourth semester of study this critical perspective is often followed by a justification of the criticism – for example, that textbooks offer just a few exercises for differentiated and independent learning, and usually are not up to date.

- **Subject**

First-year students (after the *initial block* of teaching practice) address the “principle of fit” in English classes, as well as the good explanations offered by the teacher, the sequence of exercises carried out from simple to difficult, and the media.

It can be assumed that the type of lesson planning and structuring experienced during the “initial block” of teaching practice forms a contrast to the students’ own experience of teaching in the upper secondary schools. With advancing studies, however, such principles of teaching are taken for granted and are no longer mentioned.

With increasing first-hand teaching experience (planning and implementation of individual lessons) beginning with the second semester the curriculum framework and the related (personal) freedom of the teacher in the planning of lessons gains special significance. With increasing first-hand teaching experience the knowledge of the pupils is described as “unsatisfactory”, “weak”, “insufficient”, “bad”, etc, but also as “depending on the teacher”.

During the first academic year, the allocation of attributes such as “weak” or “poor” remains as a finding, while at the end of the fourth semester such attributions are followed by numerous statements that demonstrate “ways of improving their knowledge”: “The knowledge of the pupils differs a lot, therefore you have to pick it up with the children there, where they are.” – “The pupils’ knowledge depends on

the teacher, on his/her motivation, on the teaching resources, on the class climate and on the pupils' learning conditions".

"The knowledge of the pupils depends on whether or not I address the pupils directly with my topics, everything I offer them should be connected to their world ..."

In the same way the numerous "should-statements" uttered by the students in the first and second semesters are replaced by concrete measures.

In the fourth semester the students investigated not only express demands: their subjective theories regarding their "knowledge about the subject" reflect specific and concrete measures dealing with various challenges. With increasing experience picked up in various schools in Vienna the students – for the first time at the end of the second academic year – refer to the "good knowledge of the children", e.g. "The knowledge of the pupils is sometimes quite good, you can teach them a lot when you make them practise hard. That's not a question of their cognitive abilities".

It is likely that such comments result from positive experience with their teacher trainers and from their own successful teaching.

The analysis of the notions associated with the stimulus word "school" (in the Mind Maps) proved the availability of an elaborated specialist terminology – in contrast to the beginning of the first semester when the students just used everyday language.

- **Pupils**

Overall, the students revealed a positive view of the pupils. The college entrants describe the pupils as "inquisitive, curious, eager to learn", and "individual personalities and adolescent people." The other attributes allocated to them generally have positive connotations; statements such as "difficult to control, uninterested, unpredictable" are the exceptions.

With ongoing practical experience, the number of statements such as "inquisitive" clearly decreases; the perception of the pupils as "autonomous, independent beings" and as "individual personalities" takes its place.

The associations of the college entrants with the test word "pupils" (Mind Maps) clearly show that the students are still rooted in their own role as pupils.

Associations such as: "I think the teacher is nice, fantastic", "I tell my Mom what I've heard/learned; I eat my snack in secret; I start to draw; I copy everything at the end of the lesson; I prepare a cheat sheet; I become careless; I engage myself because it's interesting ..."; the assumption that the students are still rooted in their own role as pupils is boosted by the use of the verb in the first person singular.

By the end of the second academic semester and increasingly up until the end of the fourth semester a shift in perspective takes place and the students regard themselves as "teachers" – the reference to different types of learning as well as to educational activities underpins this change: "speak, practise, repeat, cooperate, self-directed learning ...".

Whereas at the beginning of the first semester educational activities are seen

from a cognitive angle (“acquire knowledge, do one’s homework...”), this view clearly decreases by the end of the fourth semester and social learning takes its place: “acquire social skills, do one’s duties, cooperation of pupils, teachers, parents ...”.

- **Other factors that influence pupils (parents, peers, etc.)**

Future teachers think that parents want to delegate the upbringing of their children (especially “manners”) to the teachers. In almost a quarter of the students’ statements the pupils’ behaviour and manners are regarded as bad. The external image allocated to teachers by the children’s parents conveys the feeling that teachers work too little or not at all.

This negative “expected external image” of teachers is complemented by numerous statements that refer to an unfair assessment/grading; they refer to the teacher as “a smart aleck”, as “a smart ass” who is blamed for the poor performance of the children.

In the second and fourth semesters the students investigated increasingly express criticism of the parents, among other things that parents do not consider school and education as important. Overall, the future teachers reveal a feeling of being left in the lurch by parents, especially in their educational work, but also as far as teaching is concerned and they complain about a general unfavourable image of teachers.

Although the teacher trainees are encouraged to participate in parent-teacher meetings, in parent forums, etc, teacher trainees have little experience of contact with parents. It is therefore assumed that the “teacher-parent relationship” depicted above has been fed and shaped by the attitudes and opinions of the supervising teachers.

The “school heads” are primarily attributed three functions: an integrative function (integration of concerns of teachers, pupils, parents), an organizational/planning function as well as a social function. While the organizational/planning function is largely characterized by a broad constant of statements (40 % from the first to the fourth semester), the frequency of statements that can be allocated to the integrative function decreases clearly.

An increasingly realistic perspective of the school as an institution, including its players, seems to explain these findings, since these functions of the school heads can scarcely be perceived or experienced during the practical training period.

The social function of the school, on the other hand, is increasingly regarded as very important: “Establishing a constructive working environment, open, honest communication in every direction, recruitment of competent teachers ...”.

- **Classroom Management**

Increasing teaching experience of the teacher trainees seems to imply that the future teachers regard the children (as the recipients of teaching and education) less often as “children” but more often in their roles as “pupils”.

At the end of the second academic year the view of the “child as a personality and individuality” returns to the students’ minds – on an equal basis with their

role “as a pupil”. What future teachers “do not mind” can – at the beginning of the first semester – be assigned to the category “behaviour” (“...when children are noisy, bluster, jabber, romp around ...”) and – by the end of the second semester – gets shifted to the category “teaching/lessons” (“...if the lesson plan proves to be insufficient ...”).

It can be assumed that students in the second semester direct their attention to “teaching issues”; that does not mean, however, that this shift to the field of “teaching” implies behavioural issues (“discipline”).

Students in the second semester are concerned with putting their well-planned lessons “on stage” in the best possible way – very often disregarding the behavioural component.

Between the beginning of the first semester and the end of the second academic semester future teachers become more and more aware of themselves as agents (“players”) in classroom management; they increasingly become aware of their self-efficacy in teaching and in educational processes and find themselves forced into action (“I must try to make the material clear to the pupils with the help of other methods; I make other pupils explain the material”), which – until the end of the fourth semester – slightly decreases to make room for more general statements. The subjective theories of class management – over the investigation period – are characterized by references to concrete educational measures.

- **Self-efficacy**

Throughout the investigation period an increase in self-related statements and references to self-efficacy could be observed in the three areas of “knowledge of the subject”, “knowledge about the pupils” and “knowledge about classroom management”. The increase in statements concerning “classroom management” – from the beginning of the first semester to the end of the second academic semester – was significant (+ 57.15%). The pressure to act in the field of classroom management as referred to above becomes evident. The category of the “subject” seems to allow the students room for personal development; “... to design really meaningful lessons”; to “implement own priorities”: one student regards himself as a body for the allocation of educational opportunities (“When I, as a teacher – from the very beginning – say ‘not too much input’, then I deny all children the possibility of being capable of anything.”)

In the category of “knowledge about the pupils” we learn that the teacher trainees regard the pupils as *the* reason for their own professional decision (primarily expressed by second semester students); the pupils are described as people to whom they may/shall/will impart knowledge (primarily expressed by students in the first and the fourth semester). It seems that some of the students investigated have not found an answer to the question of having chosen an adequate career until the end of the second semester. The “child, sometimes anxious and in distress ... as the centre of teaching”, “children as important personalities I would like to teach” are mentioned at the end of the fourth semester.

In the category “classroom management” the problem of “discipline” is

rudimentarily recognized from the beginning of the first semester; this problem continuously bothers the teacher trainees until the third survey at the end of the fourth semester. By the end of the second academic semester, "lesson planning/scheduling" is added as a further concern. At the beginning of the first semester statements with a self-reference were identified – in such a way that students regard themselves as the responsible party when some children have not understood the material ("I have not provided sufficient information"; "... the reason is my teaching method ...").

Such statements gain ground until the end of the second semester and remain relatively unchanged until the end of the investigation period in the fourth semester; knowledge of subject matter methodology and its application in the teaching situations is articulated: different methods, tools, the use of classmates, repeated explanation, etc. Individualizing, the individual redress of gaps in the children's knowledge, as well as the reflection on reasons are added by the end of the second semester: "I'm trying to find out reasons; ... I wonder what's wrong and try to find solutions ...". In general there is some evidence that the reflective proportion in the statements – initiated and maintained through cross-disciplinary reflections on lessons and teaching – has increased.

The most significant changes throughout the survey period are these:

- Perception of the student's own role, i.e. the intense perception of his/her role as a (future) teacher – increasing tendency from the beginning of the first semester until the end of the fourth semester;
- The perception of the child as an independent personality (first semester), which is replaced by the perception of the child in his/her role as a pupil in the second semester – in order to gain a well-balanced relationship "child : pupil" toward the end of the fourth semester;
- The clear perception of educational aspects (teaching/ methodology) in connection with the students' own roles as teachers and the pressure to act and react to the requirements of the situation (end of the second semester) as well as the perception of an increasing self-efficacy – above all in the area of "classroom management";
- The understanding of the educational mission of the teacher by the end of the fourth semester and the general shift from a mere content-based mission to the more general educational and social functions of the school.

Consequences and prospects

The following table shows the results of the investigation – as hypotheses – and addresses possible consequences:

Evidence	Consequence
The development from the role of a student to the role of a teacher takes place progressively across the survey period (semesters 1-4).	„Personality Development“ as a subject throughout the entire training period.
Lesson planning as well as a “perfect” implementation of the lesson plan determine the central expectations as to teaching of the second semester students.	<i>In the second semester:</i> Teaching exclusively of small groups (max. 8-10 pupils) in order to reduce complex educational demands. Ensuring of subject matter knowledge. Ineffective classroom management must not be included in the students’ grading. A total refrain from grading for the benefit of intensive consultation would be preferable.
The perception of the child is primarily a positive one. At the beginning of the first semester the students’ statements that focus on the child are: eager to learn, curious. Increasing practical experience during the second semester presents the child in his/her role as a pupil (in the sense of “object of teaching”). At the end of the fourth semester a relatively balanced view of the child as an individual personality and in his/her role as a pupil prevails.	Focus on developmental psychology (childhood, adolescence) including diversity and heterogeneity in the broadest sense. Proof of finishing two months’ practical training (non-formal education) by the end of the third semester; intensive subject-related studies, ensuring of basic subject-related and methodological competencies as a precondition to enter the third semester of study.
A blocked practical training period of two consecutive weeks (in semester 3) expects too much of the teacher trainees because of the complexity of the educational situation – above all for students with weak subject knowledge – and ends in class teaching.	Intensive subject-related studies; broadening of the subject-related and methodological competences. Focus on educational psychology; classroom management. Documentation of the individual progression in practical teaching in a video-portfolio with comments.

The educative mission is – besides mere cognitive learning – not realized and is only partially fulfilled before the fourth semester (“from transfer of knowledge to social learning”).	Intensive subject-related studies; further development of the subject-related and methodological competences. Focus on classroom management, communication and interaction. Documentation of the individual progression in practical teaching in a video-portfolio with comments.
With an increasing period of study teacher trainees articulate more self-efficacy – above all in the area of classroom management. High self-efficacy is to be seen in connection with high competence in the field of the subjects.	The students’ system of self-concepts is to be built up. The subject-related and methodological competences are to be extended. Documentation of the individual progression in practical teaching in a video-portfolio with comments.
The (expected) unfavourable professional self-image of a teacher is replaced by increasing criticism of the pupils’ parents.	Integration of students in parent forums, open days and other school events in which parents are involved. “Integration of parents” as a main area in educational sciences.
With an increasing period of study textbooks and blackboard and – at best – work sheets are the most current teaching resources.	The lessons planned and implemented in the course of the practical studies have to (demonstrably) reveal progressive complexity. Documentation of the complexity of lessons that could be managed by a documented video portfolio.

By investigations such as the one described above the responsible persons are allocated a series of duties; simultaneously further questions are raised by them. Further research in this highly complex and sensitive area of the exploration of “the hidden knowledge in practical teaching” concerns the investigation of students:

- throughout the entire training period of six semesters;
 - studying different subjects (mathematics or German as a first subject);
 - in different training systems;
 - in a consecutive training system;
- as well as the investigation of the “hidden knowledge” of supervising teachers in comparison to the students’ “hidden knowledge”.

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