УДК 371.134(430)

Sita Schanne

PECULIARITIES OF TEACHER EDUCATION IN GERMANY: BRIEF REMARKS

У статті проаналізовано загальні особливості педагогічної освіти в Німеччині в контексті історичної ретроспективи, проаналізовано етапи реформування педагогічної освіти в країні та становлення стандартів підготовки педагогів у вищих навчальних закладах. Автором здійснено характеристику сучасних проблем вчительської освіти та окреслено перспективи подальшого розвитку та реформування системи підготовки фахівців педагогічної галузі.

***Ключові слова**: освіта фахівців педагогічної галузі, стандарти педагогічної освіти, реформування та перспективи розвитку педагогічної освіти.*

The introduction. The debate on teacher education has especially gained importance, as teacher quality is more and more being identified as crucial to student outcomes.It is now acknowledged that quality teaching is fundamental to achieve higher student learning, as it – is the single most important school variable influencing student achievement. This is why the most direct and effective way of raising educational quality is to modify teacher education and recruitment, combined with the development of means to improve the knowledge and the pedagogical skills of the teachers that are already in-service.

The aim of the article. Teacher education has often been subject to various (contradictory) educational policies and the influences of lobbies.

- Rebuilding the old traditions: Mathematician or educator
- Reforming the system: Mathematician and educator
- Raising scientific standards: University education for all teachers
- Enhancing research standards: Establishing didactics of mathematics
- Relating theory to practice: The second phase for all teachers
- Current problems of mathematics teacher education

The tasks of the article is to problem of future teacher education in the context of historical retrospective, to distinguish modern problems of teacher education in Germany and propose the way of further development.

Methodology and **results of the investigation**. 1. Rebuilding the old traditions: Mathematician or educator The rebuilding of the educational system in the Federal Republic after the Second World War in fact was a *reconstruction* of the situation before the Third Reich, not a renewal. The predominant characteristic of that reconstruction was the *tripartite school system*, with the

normal types of a *unified primary school* (1–4 or 1-6) and the three types of secondary schools: *Volksschule*, *Realschule*, and *Gymnasium*. The traditional education of elementary Volksschule teachers: The pedagogical orientation, or training of the teacher as educator Traditionally, teaching in elementary schools was viewed as a vocation for which one must acquire not only some knowledge of content but also some teaching skill. Such pedagogical knowledge was seen as a result of special training provided in a new type of institution: «teacher-preparing seminaries» [1, p. 107].

Mental arithmetic and arithmetic, natural philosophy and selected topics of algebra and geometry were parts of the examination, but the most important and explicitly noted goal was the formation of socially desired habits for citizens and the future work force, including the necessary working attitudes. Obedience under the strict rules of arithmetic was seen as supporting law-and-order thinking. Elementary school teachers were mainly *public servants* with disciplinary tasks – pedagogues. With the establishment of the compulsory unified primary school after the civil revolution in 1918, the teacher seminaries were partly complemented by or transformed into «teacher high schools» or pedagogical academies, like American teachers colleges. The education of primary and elementary teachers was nearly the same and stuck to the former traditions: a general schooling with strict syllabi and state-controlled regulations. The final examination at the pedagogical academies was not recognized as equivalent to the German *Abitur*. The struggle to get an academically oriented and scientifically acknowledged education lasted until the 1960s.

The traditional education of teachers for the higher secondary schools, Realschule and Gymnasium: The teacher as subject matter specialist and scientist. From the beginning of the institutionalization of the Gymnasium the teacher was seen as scientist and public servant. Based on the humanistic ideal of education, Humboldt's concept of *Bildung* became the paramount goal of human intellectual and individual mental development, and very influential on this type of teacher education. *Bildung* was interpreted as the totality of knowledge and judgement ability, and as the process of education at the same time. Mathematics as an important science played a dual role in this concept: It provided essential subjects of *Bildung* and through the development of mathematical thinking and reasoning represented the learning process at its most advanced level. The concept of *Bildung* established a unity of science and education, of research and instruction. The concept of *Bildung* made it obvious that the future teacher of the Gymnasium (and later of the newly founded Realschule as well) had to pursue scientific studies at the university level and acquire the full range of scientific knowledge available there. (In addition, the Gymnasium became the work place for famous mathematicians, as there were only few other state-offered positions).

Two phases were established for the formation of the Gymnasium teacher:

theoretical studies at the university in mathematics (and another subject) and some philosophy, and *practical teaching experience* (as part of the education) under the guidance of *master teachers* in seminaries and at schools.

The first state examination was the precondition for students preparing to teach in higher secondary schools to attend the second phase, separated from universities and under the full control of the state. The future teacher started an «apprenticeship in teaching,» which finished with a second state examination.

2. **Reforming the system: Mathematician and educator**. Mathematics teacher education in Germany has undergone several historical periods of reform and revisions of reforms that only referred to one or the other of the two branches of teacher education. Attempts to create a comprehensive system of teacher education first started in the 1970s and have not been generally applied. For a while, the field of teacher preparation received considerable attention generated by political authorities and implemented through legislation and regulation. A shortage of teachers of mathematics brought common efforts together to improve the personal and organizational conditions of teacher preparation and the teacher's professional life. *Political aims and conditions for the reform.*

The reform of mathematics instruction in schools from 1968 had the following goals:

- improving and *raising the scientific standard* of school mathematics according to the standard set up by the development of the academic discipline of mathematics;
- raising the general standard of education for the majority of the population in designing a *basic general education* in science and mathematics; and
- increasing the *interchangeability* of the elements of the educational system; that is, principal access to higher education and to universities from each track of the system.

The crucial and decisive *novum* of this political decision was the fact that school mathematics in all school types was primarily regarded as an unity. This view became a basis for attempts at general integration but referred this integration to the curricular level: The integration of the three educational tracks should not be done via a restructuring of the tripartite system but via the development of a *comprehensive mathematical curriculum, common and unified but differentiated, for all school types: mathematics for all!*

The need to reform the teacher education system followed from these goals:

- the intended *assimilation of the mathematical curricula* of all school types and the extending of compulsory schooling to age 15 or 16 necessitated a convergence and rapprochement of the different teacher preparation systems; and

- the increased demands on the *scientific qualifications* of the future teachers, in particular those in the primary and modern schools.

The development toward the *teacher as subject matter specialist* for all school types; as well as the cautious attempts toward the establishment of models for *comprehensive schools* made mathematics education and teacher education a political and economic issue.

Consequences were drawn in the *Frankenthaler Beschlüsse* (Frankenthal Decisions) of the *KMK* in 1970. They aimed at stronger assimilation of all teacher-training tracks. In particular, the *teachers of the elementary school*, now *Hauptschule* (modern school), became *subject matter specialists*; their education became organized into two phases in analogy to the higher secondary teacher training: The academic studies provided by pedagogical academies or institutes were turned into a more theoretical and more scientific phase complemented by a practical phase at the *Hauptseminare* and *Fachseminare* (seminaries for relating general didactics and subject matter didactics to practical teaching) under the supervision of the school administration and the direction of experienced teachers.

Students preparing to teach in the *higher secondary schools*, (including technical and vocational colleges) on the other hand, had to pass a larger part of their university studies in the education department. A certain range of knowledge in *educational and social sciences* – in particular, in psychology, pedagogy, and finally *mathematics didactics*, too – was required by regulation in some states.

3. Raising scientific standards: University education for all teachers

Although after the *Frankenthaler Beschlüsse*, all states had shared the intention of generally unifying teachers' qualifications and their training, the single states followed their agreements in different ways and at different times. Some of the traditional teacher education systems for the primary and modern school teachers first got graduate rights (Ph.D., Habilitation) and a university-like status, with the *Abitur* as a precondition for admittance.

The professional teaching staff at the pedagogical academies was increased in a very short time to an unexpected extent. Gymnasium teachers and experienced teachers from other school types, as well as graduates from the university departments of mathematics, applied for posts at the pedagogical academies, and so the old traditions of mathematics education gradually converged by adaptation and assimilation to new common views on school mathematics at these institutions first. In addition, the staff for the newly created seminaries of the second practical phase of teacher education had to be recruited.

The *community of educators* professionally concerned with mathematics education became an influential group, participating and being actively involved in curriculum development on the level of programs and syllabi, textbook

production, and research. At the beginning, however, the urgent problems that arose from the *KMK* decisions and the time limits for the transforming of the new goals into mathematics curricula caused mathematics educators to confine themselves to a practical *engineering model* of designing and constructing sequences of concrete teaching units for school mathematics. There was little interest in starting basic theoretical research or in participating in the exchange or discussion of developments in other countries.

4. Enhancing research standards: Establishing didactics of mathematics as an academic discipline at the universities

The ambitious goal of teaching mathematics to all pupils, principally accepted by the *KMK* decisions, reinforced the insight on the part of the politicians, too, that the teaching and learning of mathematics should be scientifically investigated and that the results of research on teaching and learning mathematics should be transmitted to all teachers as well. The foundation of a central *Institute for Didactics of Mathematics* (IDM) by the VW Foundation took over many of these tasks and created a network of international relationships and cooperation.

The training of the future teacher of secondary mathematics at the university had to be first supplemented and then complemented by studies in didactics of mathematics (*Fachdidaktik Mathematik*) [5]. The VW Foundation granted the first chair (an ordinary professorship in didactics of mathematics); other universities were allowed to establish chairs, too. Regular studies in didactics of mathematics were required in addition to mathematical studies in study programs, the model of practical teaching periods from pedagogical academies was adopted for the university studies, and regular studies in educational and social sciences were added as parallel parts of their university studies for all kinds of teachers. This marked a strong effort to broaden and improve the pedagogical, psychological, and sociological knowledge of all preservice students and its acceptance as a prerequisite of professional teaching. More importantly, it helped to establish and enhance fundamental research in mathematics education as an interdisciplinary science at the university level, installed and cooperating frequently within departments of education, more rarely within departments of mathematics (but this differs among the universities).

5. Relating theory to practice: The second phase for all teachers

The necessity for research in mathematics education was acknowledged by establishing scientific studies at all institutions of teacher education in the first phase. Consequently, the transmission of theoretical knowledge into practical action should be enhanced for all teachers, too. Therefore the second (practical) phase of teacher training, a peculiarity of the German system and so far provided only for the future teacher of the higher secondary schools, was enlarged and extended for modern and primary teacher training. The second

phase was organized into an integrating «main» seminar for all teachers of one region. This seminar was devoted to general didactics and common aspects of the professional activity of the future teachers, and the region also provided specific seminars devoted to school subjects that were run by subject specialist teacher trainers. The confronting of traditions and innovations made it obvious that the traditional *model of apprenticeship* applied so far for this phase had become obsolete. There was a new conception of providing practical knowledge of the profession by *explication and generalization of the practical experiences* and *theories of practice* [4].

6. Current problems of mathematics teacher education

The history of teacher education reform in Germany impels us to move carefully and to make judgements about developments that are worth noting, analyzing, and studying. There are a small number of professionally derived reform efforts that have the promise of making things easier. There are still unsolved – or even untackled – but relevant problems:

- *Relating theory to practice* and integrating the different parts of training describes an urgent problem of teacher education. There is a lack of successful attempts to integrate didactics and mathematics, connect the various subjects of the studies to create comprehensive approaches, and provide designs for project work and cooperative teaching. This lack, taken with the lack of cooperation and relations between the two phases of teacher education, has resulted in students becoming overburdened and has pushed them into ritualized and unquestioned teaching practices. It has made them hostile toward practical innovations or applications of research findings. It causes a lack of motivation and introduces distrust into the teachers' professional perspective.
- The *mathematics education* provided by university mathematicians through traditional lectures and the requirement of solving compartmentalized exercises only – with no emphasis on reflection and meta-level thinking – often leads to platonic views of and attitudes towards mathematics that do not foster new and differentiated ways of teaching mathematics to all pupils.
- The *engineering approach* to mathematics teaching tends to reduce didactics of mathematics to an execution and realization of administrative regulations and curricular programs. The search for «teacher-proof curricula» or «teacher-proof textbooks» reinforces traditional prescriptive and normative teaching ideals and the illusion of «best means and methods for any pupils or purposes». The conceptions of guiding pupils to a «social construction of knowledge» and «social negotiation of meaning» as new teaching paradigms then become a utopia.
- The *changing role of the expert teachers* in the seminaries of the second phase is caused by administrative measures designed to regulate the increasing number of teacher candidates. The teacher trainers have to take over more tasks in evaluating and assessing than in observing, advising, consulting,

and teaching. The function of being more selective has changed the cooperative atmosphere in the seminaries into competition, discouragement, and anxiety [3].

Perspectives for a reform of teacher education

Conclusions. There is some impulse towards a reformof teacher education in the Federal Republic of Germany. In North Rhine-Westfalia (NW), there are rather concrete suggestions, which, however, aimless for a quality improvement in the sense of educational emphasis but for exogenous targets: internationalisation, opening of the job market, more job opportunities for students of the teaching profession.

The reform planned in North Rhine-Westfalia regards:

1. the abolition of the teaching professions based on levels (see KMK-Declaration of 1970) and the restoration of a teaching profession for Höhere Schulen [higher schools] and a teaching profession for Volksschulen [people schools], while the Volksschullehrer [people school teachers] are to have their standard time of studies reduced by two semesters;
2. increased employment of persons who have not studied the teaching profession at university;
3. the model for the development of consecutive courses of studies (that means basically: first, a 6-semester Bachelor-course, not regarding the teaching profession and afterwards a 2- to 4-semester Master-course which is decidedly oriented on the teaching profession) [2, p. 106].

This consecutive-model may look appealing from the angle of the job market, but it does not at all serve to improve the competences, which are needed specifically for the teaching profession. Such an improvement is much needed.

In spite of its high expectations it seems more promising to push the consequential realisation of Osers thoughts. Here are tenmeasures, oriented on Fritz Oser, which are of importance for the successful application of his concept:

1. Standards have to be conceived as an important part of the curriculum of teacher education.
2. Students of the teaching profession must be introduced into the concept of standards. In the sense of their own responsibility they should learn to regard the reaching of standards as their duty.
3. Every situation of education buildsmodules (emphasises of content and time) into the course of studies, to be able to reach an exemplary chosen number of standards.
4. There are portfolio-concepts, developed for every situation of education, which grant that standards are being tested on the level of action and represented on the theory-reflexion-level.
5. In every university there is a facility with sufficient budgets for research and development and specific professors, which regard research into the profession of a teacher and in-class teaching as their principal duty. These

are the institutions to test the reaching of the standards empirically and from the angle of educational theory.

6. Phase 2 of teacher education (Referendariat/Seminar) has to be carried more intensely by persons from Phase 1 (studies/university. This is to avoid the tendencythat Referendariat ismerely a socialisation into the status of a teacher and into the dominating culture of the institution at which the Referendar teaches.

7. The experienced teachers (Betreuungslehrer) of phase 2 are increasingly included in the process of planning and building the standards of phase 1. They help to promote experts research during the building process of the standards and to manifest expert behaviour.

8. A part of standards is to be reached only in phase 2 of teacher education. Here modules must be created in cooperation with universities.

9. An essential part of standards is to be acquired in phase 3 next to the daily business (learning on job). Phase 3 of teacher education is specific to the profession; thatmeans that an obligatory in-service training has to go along with the first five years of practical experience (after the 2. Staatsexamen).

10. With regard to the development in Europe and the globalisation, common standards for the profession of the teacher should be laid down on an international basis.

LITERATURE

1. Eckinger Ludwig: Lehrerbildungsreform aber wie?, Dokumentation des Deutschen Lehrertages, Bonn, 1998.
2. K. Wenzel: Teacher Education System in Germany METODIKA [Electronic resource]. – Vol. 3, br. 5, 2002, str. 89–108. – URL : http://www.didaktik.mathematik.uni-wuerzburg.de/history/meg/mathedb4.html
3. Oser Fritz: Perspektiven der Lehrerbildung in Deutschland, Abschlussbericht der KMK, Berlin, 1999.
4. Schulz Dieter / Wollersheim Heinz-Werner: Lehrerbildung in der öffentlichen Diskussion, Neuwied, 1999.
5. Wollenweber Horst: Das Berufsbild des Lehrers als Grundlage der Lehrerbildung, Frankfurt, 1996.