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The peculiarities in reformation of the future technology teachers preparation in the Nordic Countries in the end of XX century

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Abstract

The article examines the peculiarities in reformation of the future technology teachers preparation in the Nordic countries in the end of XX century which defined their success and international recognition in the international educational space. Based on Nordic authentic scientific literature, it was revealed the particularities of educational reforms in each of the Nordic countries.

Key words: technology education, reforming process, educational model, professional competence, technology teacher.

The relevance and problem statement

The reforming of the technological education in the Nordic countries in the late twentieth century was one of the main factors that allowed to all countries of the region to reach a leading position in the world in educational sphere. In the preparation of specialists in higher educational institutions, it is important to use the best practices of the world on issues of technology teachers training. Thus, during the period after the Second World War the Republic of Finland has done about thirty targeted educational reforms which ultimately determined the priority of education (especially of the technological education) in development of state.

Regarding the training of teachers it should be noted the fact that the education of future technology teachers in the Nordic countries began to integrate into the system of university education since 1977. Thus, in the highest educational institutions of the Nordic countries this education was organized in the form of training courses or complex study of single subject. It was assumed that these two directions were the basis to acquire professional knowledge. Such courses were held each semester by choice of students. Study of a course was ending with an exam (usually in the form of a written exam or writing a seminar work).

In addition, at the end of the entire course of study, future teachers of technology were required to perform a creative project, thesis or analytical studies as final control of acquired knowledge and skills.

As it follows from our research, next significant common changes in technologies teachers training of the Nordic countries took place in 1984. Previously, elementary school teachers taught all subjects except sloyd (technology), while secondary school teachers taught 2–3 subjects only. It may be noted on the example of Sweden that the new reform was aimed at training of teachers with more narrow field of specialization (specialization in the Swedish language, or in mathematics) in addition to other subjects, besides the technologies. As for teachers of technologies, on the contrary, they have had to expand and deepen their knowledge. However, the next step of reform was a requirement for future technology teachers to get education in some other subjects to be able to teach them in elementary or high school. In addition to sloyd (technologies) it became possible to get qualifications of teacher in mathematics, Swedish or English by choice. The school subject of technologies also became additional subject to an choice. Another innovation was that the training of teachers for woodworking and metalworking should have been done on separate parallel programs at the universities of Gothenburg, Linkoping and Umea (Sweden). Therefore, the Linkoping and Umea Universities have initiated a new educational program for the preparation of future teachers for wood- and metalworking, while following the requirements of reform, the training program for teachers of home economics and work with textiles was updated at Uppsala University. At the same time, Gothenburg University has moved away from tradition and developed an educational program by combining work with textiles, wood and metal in one subject. Students began to receive more theoretical knowledge of various materials, but got less time for acquiring different skills to work with these materials.

Analysis of recent research and publications

Analysis of scientific papers has shown that Nordic scientists K. Borg, L. Lindstrom (Sweden), E. Garber, M. Johanson J. Peltonen (Finland), J. Rasmussen (Denmark), G. Thorbjörnsson (Iceland) determined at different times the identity and special character of future technology teachers education as the most important objective pattern in broad spectrum of theoretical and practical problems of foreign pedagogy. That allows to supplement the global achievements of the Northern European Highest Pedagogical School.

Therefore, the **aim** of the presented paper is to identify the characteristics of reforming the content of future technology teachers training in the Nordic countries, which determine its effectiveness in the presented segment of the Northern European highest pedagogical education.

The main material of research

Over the last thirty years there have been various reforms which changed particularly the Nordic pedagogical and technological education. Thus, the highest education systems of Finland, Sweden, Denmark, Norway, in their modern forms were formed during the last decades of the twentieth century, thanks to two reforms in 1977 and 1993. However, by 1988 there were only three main categories of compulsory school teachers: «lågstadielärare» (primary school teachers, for classes 1–3), «mellanstadielärare» (teachers of secondary classes 4–6) and «ämneslärare» (the main secondary school teachers i.e. upper classes, 7–9) [*Comparative study…*, 2009].

Be noted that at 1991 the great reforms in Denmark and Iceland were launched, whose aim was the deregulation of higher education, creating more autonomy for each university, providing greater opportunity for individual choice of students. The reforms were approved by Parliaments in 1992 and the new Law on Higher Education came into force on July 1, 1993. In the new system, the volume of various programs and the distribution of subsidies between institutions were determined by the requirements of students and qualitative and quantitative achievements of each university. Organization of learning and the proposed set of courses are determined at the local level, which means the functioning of the educational process, which is aimed and motivated by local educational resources. Along with the introduction of targeted programs, in 1994 was a change of focus on learning, not on teaching, that changed the role of evaluation. Most importantly, the evaluation of students became a part of the educational process, not just as a final control of each semester [Garber 2002: 132–145].

Our research found that the second half of the XX century is characterized by the restructuring of Northern European education system and increasing the number of students of highest educational institutions in Denmark, Norway, Finland, Sweden, including universities, which train teachers of technologies. The main reason for this trend is the new state policy in these countries, because of the focus on equal opportunity in education for all citizens, particularly national minorities. Nordic society has always been aimed at the implementation of the principle of equality of opportunity in the mastery of the education for all social and age groups of population regardless of gender, social status, ability, cultural heritage.

K. Borg stresses that the model of the secondary school in the Nordic countries reflected the anti elitist, egalitarian nature. It oriented students from different social strata how to use the principle of choice rather than study the general list of subjects. That allows students to choose the most important of the proposed range of disciplines. Just at this time the universities have defined additional specialization for teachers. To Latin, biology, history, physical education, schools offered “practical” subjects such as industrial design, home economics, typing or accounting [Borg 2001].

In 60–70 years, many European countries have adopted legislative documents according to which education should last for 2–4 years in order to unify the accessibility to secondary education.

Research of Northern European model of secondary school has shown that the program of primary and secondary schools were united by a common 9-year program. This system, that was composed by 9 years of primary education and 3–4 years after primary education, was introduced organizationally in Sweden (1962), Finland (1970) and of Denmark (1975). Three-stage system of education usually included classical and modern secondary and technical schools with different specialisations (profiles) [Johanson 1996: 56–77].

In the beginning of XXI century the training of teachers, who can both teach school subject technology and also receive additional specialty as a teacher of primary school is conducting in the Nordic countries. Gradually, professionally trained teachers of technologies, which had a significant knowledge and experience with the craft, began to acquire other additional pedagogical specialties.

It is important to emphasize that in 2000 the Swedish Parliament has determined the need to develop a new program of the technological education, which came into effect of July 2001. Compared with the previous one, it had greater flexibility and integration nature of the educational process. Reform was concerned both students as future technology teachers as well as researchers and PhD students, who were directly related to pedagogical education and work. The new program was aimed at deepening and development of relations between universities and school that is, directly between the educational process and the introduction of a specialist into the work environment [*Reforming higher…*].

Analysis of scientific works of European scientists-educators suggests that since the 2000 all pedagogical education, starting from kindergarten until high school, was united and organized at the national level within unified Program of pedagogical education. For teachers of sloyd (technologies) it was mandatory to take a course of subject education for 1,5 years and pedagogical practice at university level. The new program provided that at least one year is enough to study the most subjects (exceptions were a few subjects, but not technologies (sloyd)). On the other hand, the new program expanded new horizons for interdisciplinary learning and new combinations of subjects such as “sloyd and art”, “sloyd and History”, “sloyd and physical training” [Garber 2002: 132–145].

The education system, within an united opinion of leading scientists-educators, is an unique phenomenon, as well as the culture of its people is. It is much more complex than other systems (transportation, communication, security) because it is deeply connected with the spiritual and material aspects of past and present. In light of this, education and its organization have their own peculiarities and periods of formation and development in each country.

However the most powerful initiators of changes in the system of education are not systemic factors like proper problems or adversities, but the ones on the outside of the system. Above all things, learning and upbringing priorities and requirements caused by including the country to the common movement of world community to future, changes in production, culture and behavior. So, while reformation of highest education, on the one hand, the priorities of saving cultural heritage and variety of national systems of education and, on the other hand, the task of improvement of international cooperation, mobility, student employment in European or international habitat, international competitiveness of highest educational institutions are considered.

It should be added that for any system of education of different degree the financial issue is particularly important. Until the middle of XX century the funding of system of pedagogical education didn't have a large scope. Since 1950's the state started paying more attention to preparation of qualified teachers. Firstly a significant portion of funds was forwarded to development and reorganization of internal system of management and organization of pedagogical preparation of highest educational institutions – up to 40% of all state costs for highest education. Simultaneously increment of share of the gross national product that is spent for locational colleges started. By the mid 70's funding for highest education increased in 5 times compared to the previous period. Next years costs for highest education expanded not so abruptly. In common state costs for education appropriations for institutions that carry out pedagogical preparation make up more than 13% [Peltonen 2009: 11–38].

Through settling the issue of funding, implementation of several trends in education branch in Nordic countries became possible. Firstly, an alteration in the distribution of the training load. Technology education became longer but less determined. Earlier it was possible to become a teacher of sloyd (technologies) after 3 years of education. Now, to become a teacher of technology and one more subject it is obligatory to study for 4–4,5 years.

During this period of training general pedagogical knowledge takes not less than 30% of all time. The organization of the course is based on interdisciplinary connections and themes being connected with contents of technology subject for pupils at schools. World and life, in opinion of new program's of teacher training developers, are not spread between the subjects. That's why, first of all, teachers must have an experience of teaching several subjects and be able to combine different knowledge. Secondly, they have to comply balance of diverse content of pedagogical education of technology teachers. The balance between practical skills and academic knowledge has changed considerably. Earlier emphasis in pedagogical training of technology teachers was put on skill. But nowadays general academic level is as much, if not more, significant. Entry requirements can be the proof of this change. In 1960's applicants could enter pedagogical colleg-

es with their level of academic knowledge below average but with a great experience in craft. Now all the way around: it's important to have high level of academic knowledge with level of craft below average. General pedagogical knowledge takes 30–40% of all time, but technologies and the rest of subjects take 60–65%. Content of knowledge of subject technology decreased slightly, but more time for practice was added.

In 2011 the new stage started for Nordic system of preparation of future technology teachers, that not only has kept in its basis achievements of the previous reforms but also become their logical development.. Entry requirements became common for teachers of any subjects, with additional requirements in special cases. Since then the preparation of technology teachers is being upgraded seeing the urgency of developing information society. First of all, certain terms and conditions were set out by Nordic society and government, which mostly referred to training of high school pupils on technology subject, especially within the programs that prepared for admission to the university. Such suggestions appeared because of discrepancy of subject`s contents and university`s entry requirements. Due to new system proper changes had to be brought in contents of subject's education program and training of future technology teachers. The only mandatory program for teachers of all subjects was created. 1,5 year they have to study compulsory subjects such as pedagogy and teaching methodology, take teaching practice, etc. Education of next years (2,5–3 years) students chose from specialty by their will. Student scientific research work for ending of program of training technology teachers was a component of mandatory part [*Reforming higher…*].

Finally, it should be noted, that though not representing solid administrative and political union on geographical map of the Old World, Nordic countries always tended to close cooperation with each other in various economic branches and spheres of vital functions because of unity of historical processes, cultural traditions and social and economic foundations. For coordination of this cooperation advisory and consulting Nordic Council was formed in 1953, half a century ago, by Denmark, Sweden, Norway, Iceland, and Finland that joined 3 years later. It is still playing a key role in determining a coordinated and optimized, from all points of view, course to educational, technological, industrial and social development of each country separately and the region in general.

Conclusions

Based on authentic scientific literature it should be noted that profound cultural changes have undergone in the Nordic countries over the past century. The acquisition of significant achievements in the field of technological education in general and technology teachers preparation particularly, in turn, allowed to achieve the radical changes in the economy compared to the transformations that

occurred in other areas of life in these states and their citizens. Changes in education have been much more efficient due to its traditional for Nordic countries high status in society. Thus, common features of educational model for technology teachers training were formed, in which training programs reflected modern knowledge of production processes, such as mass production and handicrafts based on individual production in middle and small business. Therefore, training of future technology teachers in Nordic countries began to provide the formation of abilities of future technology teachers to organize educational labor activity of pupils, taking into account the type of production.

Today technological education in Nordic countries can compete in quality with the best world systems of future technology teachers training, and as a result, it can already rely on a sufficient number of local sources of the pedagogical issues. It corresponds to requirements of modern time and it is well integrated into the European educational space.

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