

Challenges facing the educational system

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Die Zukunft der Bildungsforschung

(Red.) Während der Aufbau der Schulsysteme und der Erziehungswissenschaften sich im Rahmen von Nationalstaaten vollzog, zeigt sich vor allem seit dem Ende des Kalten Krieges eine bildungspolitische und wissenschaftliche Verschiebung von den Nationalstaaten und den Universitäten hin zu transnationalen «Think Tanks» und Organisationen wie der Weltbank, der OECD oder der «European Science Foundation» (ESF). Inwieweit diese Verschiebung inhaltlich problematische Konsequenzen hat, wird in der nachfolgenden Diskussion um einen Versuch Manfred Prenzels erörtert, eine europäische

erziehungswissenschaftliche Agenda im Rahmen des ESF zu formulieren. Wir danken der ESF und Manfred Prenzel für das Recht des Abdrucks und die Bereitschaft, die Auslegung zu den wissenschaftlichen Herausforderungen hinsichtlich des Bildungssystems international diskutieren zu lassen. Dass die kritischen Anmerkungen überwiegen, hat weniger mit der getroffenen Auswahl der Kommentatoren als mit dem Umstand zu tun, dass voraussichtlich sympathisierende Kolleginnen und Kollegen ihre Teilnahme aus Zeitgründen leider absagen mussten.

Challenges Facing the Educational System

■ Manfred Prenzel

Introduction

Nowadays, educational topics are often in the headlines. The OECD's yearly reports (Education at a Glance) are eagerly awaited by the media and politicians, as are the publications of international comparative studies such as the *Progress in Reading Literacy Study* (PIRLS), the *Programme for International Student Assessment* (PISA) or the *Trends in Mathematics and Science Study* (TIMSS). Politicians want to find out about the strengths and weaknesses of their own educational system while also obtaining suggestions from international benchmarks to make policy decisions.

All this, together with an increasing tendency to consider empirical evidence when making decisions on educational policy, is based on developments in the social sciences in recent decades. Social science research has produced:

1. New test conceptions and evaluation models which allow reliable measurements of advanced competencies.
2. A great number of reliable and valid indicators for lesson and school quality.
3. Theoretical models which allow characteristics of social and cultural background to be surveyed and interpreted.

4. New sophisticated procedures which make economical sample designs and analyses of background conditions possible at different aggregation levels.

This progress in theories and methods has created a systematic education-monitoring system both at an international and a national level. This monitoring system surveys educational results and takes both input and context factors (educational output, incentive structures) as well as the qualities of educational processes (learning and performance climate) into consideration (Seidel/Shavelson 2007).

The development of a scientific monitoring system, both within Europe and worldwide, has been driven by the importance which education has in a global knowledge society and the fact that this importance is becoming increasingly clearly recognised. In a knowledge society, education becomes a prominent production factor for the further development both of the individual and that of society. Beyond that education in general creates relevant preconditions for physical and mental health and for the readiness to engage in different areas of human expression. However, the dynamics of a knowledge society also bring new challenges for learning. What is needed is intelligent knowledge which can be applied flexibly. Learning is not restricted to a

certain life phase or an institution (school); it becomes a continual task ranging across the life span.

There are at present four main challenges for educational systems in Europe; they are also challenges for educational research in Europe.

Participation in society for everybody

Democratic societies are based on the political participation of their citizens. Educated populations are thus fundamental to Europe's democracies. Crucial political decisions, such as those about environmental problems, depend on the number of people who make decisions based on a good information base. But, in addition, training and further education protects against unemployment, results in different levels of income, and, on average, promises better health status. It can also be a major factor in decisions as to where to locate economic activity. Finally, education helps to understand oneself in relation to the social, cultural and physical world, and to develop meaning as well as identity engaging in diverse cultural and social activities.

The basic requirement for participation in society is often termed 'literacy'. In a narrow sense, this refers to reading and writing as key competencies: in a knowledge society, knowledge is stored and transported in the form of texts (of different types, including tables, figures, diagrams). Thus, literacy necessarily refers to the advanced competencies of gaining knowledge by reading or making knowledge accessible to others by writing. In a metaphorical sense, one also speaks of mathematical and scientific literacy which are also understood to be key competencies in a society and culture formed by the sciences, technology and mathematics. Literacy, however, can also be seen as a key to manifold cultural artefacts, traditions and activities. Research in education is centrally concerned with how to promote and sustain 'literacy' in our societies.

Comparative studies which describe the average competency level and the distribution of basic competencies at a national, European and international level (such as the OECD's Programme for International Assessment) show huge differences between (European) countries' average levels, which correspond to differences in development of two or three school years. They show that different countries have hugely different amounts of success in guaranteeing an acceptable basic level of education for all young people. In several European countries, due to their lack of competence in the areas of reading or mathematics, more than a quarter (e.g. Portugal, Spain, Italy, Greece), sometimes more than a third (Turkey), of young people have poor future prospects of successfully completing a training or third-level education course, having a job, or participating in social and political life. This produces huge follow-up costs in remedial education and, at the extreme, crime and punishment. But the

greatest loss is in wasted potential.

An important object of research in educational science is therefore to analyse the background conditions of different competency gains which result, amongst other things, from the degrees to which different family surroundings provide encouragement and motivation. The links between characteristics of social background, participation in education (from pre-school institutions to institutions of adult learning) and the development of competencies lead, in several countries, to unequal chances for population groups as well as the neglect of cognitive potential. These problems may require major societal interventions. But research also illuminates the conditions behind the successful teaching and learning of basic competencies in educational institutions. Particular forms of teaching can compensate for poor earlier performance and can help to equip young or older adults with necessary basic competencies well beyond school.

New blood for the challenges of the future

In some respects education does not differ greatly from sport. In order to have a strong top group, one needs as broad a range as possible. However, a look at the distribution of competencies reveals that countries, regions or even individual schools have different degrees of success in detecting and promoting talents. Europe cannot afford to have poor performance or to neglect potential. In many European countries, falling birth rates mean changes in the age pyramid. In order to be able to meet the need for highly qualified workers in research, development and production, more young people must be won over and trained in these areas. Guaranteeing new blood – in particular, in the areas of mathematics, science, information technology and technology – not only depends on cognitive abilities but also on attitudes and interests. In the recent past, several Reports of the European Commission have drawn attention to this problematic situation (European Commission 2004, 2007). One specific problem is still how to encourage girls to study more science and technology and to persuade them to continue on to further training and university courses.

How can this problem be solved? Current social science research provides convincing evidence that motivational factors are behind the choice of studies or career. These motivational factors are related to self-concept and beliefs in self-efficacy, the image of science and technology, and the development of interest. Many results show that motivational differences arise over the course of schooling, especially at secondary level, and that these differences can be largely traced back to lesson approaches. This means that they can be corrected. In addition, there is evidence that a stronger orientation towards application and an emphasis on access to research in science lessons has a positive effect on

the cognitive skills and motivation of both girls and boys. Thus social science is pointing the way to changes with great potential benefit for Europe.

Lifelong learning

Dynamic advances in knowledge and the shortening of production cycles mean that new learning challenges have to continually be faced in order to be able to keep up with the developments. Even after a long period of third-level education or training, nobody today has completed their training. On the other hand, technological developments and the World Wide Web make extensive knowledge supplies accessible to everybody. These developments mean new challenges for learning in school and other educational institutions. At the core are the basic competencies which can be connected to further learning, or the basic ways of thinking and working in a discipline which are necessary in many situations. Increasingly, the question of how learning can be supported over the whole life span must be asked, both in the context of job requirements and in important everyday contexts which concern, for example, health, the environment or politics.

The need for lifelong learning requires a change in curricular orientation and a much better harmonisation of curricula between different training and learning phases. The contribution of educational research must also be to clarify requirements as well as to explain models of competency development and examine their coherency. The requirements of both receiving and delivering educational institutions must be adapted to each other and instruments must be made available to enable reliable measurements of flexibly applicable knowledge which can be easily connected to further contexts. In the context of lifelong learning, questions of motivation and beneficial learning incentives also gain central importance. A separate object of research can be seen in the challenges of learning with information technology – over the whole life span.

Migration and integration

In a united Europe, mobility and migration are welcome but also bring problems. Across Europe, there are major differences in the proportions of immigrants and in the reasons for immigration. The migration situation in European countries with a pronounced colonial history is different from those countries where there is high immigration due to economic reasons (job immigration). Education has a crucial role to play in alleviating the difficulties and negative consequences of migration and in enhancing the benefits of mobility. Command of the language of the country, for example, plays a significant role in integration. The language of the country of origin, however, is not simply replaceable, because it still plays a central role for the com-

munication and cultural participation in family and neighbourhood settings. The educational system is expected to make a considerable contribution and to affect the generation of immigrants themselves, who must be supported in language acquisition, but also (or even more so) that of their children (often called 'second generation') in the second language as well as in their mother tongue. However, at present Europe is failing. The data currently available show that children with a migration background (of the first or second generation) on average have a much lower performance level in training courses and further-education certificates, and also in the competencies measured, than children without a migration background. These differences can mostly be traced back to differences in social background.

Educational institutions are faced with the challenge of giving children and young people equal and fair chances to develop, irrespective of their social and cultural background. As numerous results show, the early learning of the language which is used in school plays a crucial role in successful integration. However, many studies indicate the difficulties with which schools are confronted, for example, due to compositional effects. Children from immigrant families are not evenly distributed across all the schools in a country. Rather, they increasingly attend (e.g. because of their place of residence) certain schools. This can lead to those schools having very large proportions of children and young people with a migration background (frequently from many different countries of origin) to instruct. The corresponding compositional effects worsen these children's chances of developing competencies which will provide them with good perspectives for a successful training course and career. The example of compositional effects also shows that although educational concepts are important in the schools concerned, they need to be supported by school and social policy. Longitudinal databases show strongly how important early education and training is for social and economic integration and success. Evidence from the social sciences substantiates the claim that an early acquisition of the common language in kindergarten and school is a crucial factor for success and integration. Evidence also shows, however, that integration depends on a balanced preservation of non-national languages and cultures.

Evidence-based educational policy

Due to the exceptional quality of the methodological foundations on which current educational research in Europe is based, the empirical findings which it has presented in recent years have to be taken seriously. Public attention is particularly directed towards educational research when its research findings indicate considerable problems in educational systems. The way in which

the public and political sector can react to the findings of educational research can be seen from the example of the publication of the OECD's Programme for International Student Assessment in Germany, but also in a whole group of other countries (e.g. Austria, Denmark, Luxembourg, Norway). In Germany, educational policy was seriously shaken by the Programme for International Student Assessment (PISA). As a consequence of its results, the basic structures of the school system were questioned and changed in several federal states and new national curricular benchmarks (standards) and nationwide evaluation procedures were set up, along with reform programmes from pre-school education right up to teacher-training programmes.

The progress which has been made in educational research confirms beliefs that – similar to the health sector – future political decisions and professional measures in the area of educational science should increasingly take empirical evidence into consideration. Several European countries (e.g. United Kingdom, Netherlands, Germany or Nordic countries) are already showing quite pronounced tendencies towards this.

Conclusion

However, educational research is still a long way away from medical research in its scope and magnitude of funding. At present, educational research is first and foremost capable of providing descriptive knowledge which identifies problem situations and challenges. This knowledge is highly relevant for evidence-based educational policy as it provides reference points for political decisions. Studies (for example, with longitudinal designs) which identify causally relevant conditional factors and thus provide explanatory knowledge are particularly helpful in this area. However, these studies are very complex and expensive. There is a special demand for studies providing knowledge of effective measures to achieve specific aims under given conditions in an educational system. In order to obtain this type of technological knowledge, systematic experiments in the laboratory and in the field are necessary, together with cleverly planned intervention studies. In the future, these types of studies must be strongly supported in order to provide better knowledge bases for political and professional players in the area of education in Europe.

The Necessity of Empirical Research, Cultural Values, and the Insufficiency of Technological Knowledge in Education

■ Fazal Rizvi

Professor Manfred Prenzel's account of the challenges facing education systems in Europe is, in my view, perfectly accurate. He is absolutely right that a key challenge facing democratic societies is how to prepare their citizens for effective political participation. As societies become ever more complex, a major task for educational sciences is to determine how to promote and sustain literacy so that students are able to acquire the knowledge and skills they need not only to have fulfilling lives but also enrich the communities in which they live and work. In a democratic society, everyone must have this opportunity for political participation – to realize their own potential and be able to contribute to their society.

Prenzel argues furthermore that educational systems face the challenge of creating a larger pool of talented people who are able to understand and negotiate the demands of the future, while ensuring that this is done in a manner that is socially equitable. However, if the future is characterized by dynamic and rapid advances in knowledge, and by fast changing modes of production, then educational systems can no longer focus merely on pri-

mary and secondary education, but need to regard life-long learning as essential. And if we are all to become life-long and life-wide learners then educational sciences need to develop new systems of curriculum, pedagogy and assessment. And finally, Prenzel argues that as Europe experiences profound demographic shifts, educational systems must become more serious about cultural diversity, catering to the needs of migrants.

To meet these historically unprecedented challenges, Prenzel insists, that a more rigorous empirically-based approach to educational research is necessary, so that policies and practices are driven more by evidence than by prejudice or simply precedent. Currently, most educational research, Prenzel maintains, is capable only of describing situations and challenges, and is poorly placed to provide explanatory knowledge of how particular conditions cause certain outcomes. According to Prenzel, what is needed is a «type of technological knowledge, systematic experiments in the laboratory and in the field», «together with clearly planned intervention studies». In this way, educational research should aspire to the status of medical research.

Now while it is hard to deny the importance of vigorous and robust empirical research, it is, in my