The 2017 AERA theme was Knowledge to Action: Achieving the Promise of Equal Educational Opportunity. How does your scholarship align with the 2017 meeting theme?

To be honest, I am happy to be a part of the Norwegian education system, which has been organized to offer equal educational opportunities for all. Over time, I have learned to appreciate the values and policies behind the Norwegian education system. Since the early 1950s and 1960s, the question of equal opportunities for all has been, and continues to be, a leading principle for reform and development in Norwegian education, from kindergarten to higher education. Given that the basic comprehensive school for students aged 6–15 years in the public sector (including elementary and lower secondary schools) includes the majority of all students (96 percent) in the country, such a principle has been of tremendous importance to the understanding of education as a common good and opportunity for all across social and geographical differences. Over the last 30 to 40 years, I have participated in several research and development initiatives and national curriculum reforms that explore the consequences of implementing this principle in schools and initial teacher education.

In 1987, a new national curriculum for basic comprehensive schools was launched. This curriculum reflects the historical values of equal opportunity for all and the principle of teaching and learning adapted to individual students’ needs and abilities. The question of inclusive education was an integral part of the curriculum philosophy. As a secretary of this curriculum development in 1984–1987, I was keen to note how such values were implemented in the general guidelines and in the content knowledge of the curriculum to be used in schools. At that time, the question of social and educational change SIG adopts an interdisciplinary and international approach to understanding many aspects of educational change, including large-scale reform, school-initiated change, school improvement, and classroom-level change.

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cultural inclusion and identity formation in school was a significant part of the education policy. How to support and bring forward school curriculum planning based on situated local community knowledge and needs was a vital component of the implementation policy.

A variety of interesting school development initiatives were conducted locally and nationally in the 1980s and early 1990s to assist schools and teachers in implementing the values and guidelines for teaching according to the ideas of equal opportunities and learning for all. Development projects that focus on local school development planning and evaluation, process writing/writing to learn, project work, and cross-curricular teaching were all parts of this evolutionary process.

Going past the years of 2000 and onward, we are witnessing a policy shift in how to improve schooling and learning for all, which, to a large extent, has been motivated by the mediocre scores of Norwegian students in the Program for International Student Assessment tests. The steps forward are defined by a variety of development programs focusing on students’ generic competencies in reading, writing, and mathematics, and in the area of digital competency, also implemented through revised national curricula. While the 1980s focused on a wide range of collective efforts to close the gap between social and cultural differences in school, the new millennium has moved the debate and the improvement efforts more closely to individual students’ learning and their achievements as defined by national standards. For me, how different conceptions of equality in the Norwegian education system are emerging over time and manifested in curriculum guidelines and assessment procedures are to become an interesting research topic.

Given your work on information and communication technologies in teacher education, what do you see to be some important contributions of this work to the field of educational change?

In my latest research from 2000 onward, I have focused on the use of information and communication technology (ICT) as a vehicle for learning—a means not only for individual learning in the subjects but also for changing social practices that support learning for all. I have been a part of two large reform projects involving ICT in teacher education (TED) over the last 15 years; these projects have affected my understanding and experience of educational change in significant ways. I took on a leading planning and management position in both projects. In 2000, the University of Oslo embarked on a four-year national initiative to reform initial teacher education through the use of ICT. On a national level, this reform, called the Program for Teacher Education, Technology and Change (PLUTO), involved seven teacher education institutions comprising K-12 schools at different levels in Norway.

In the overarching objectives of the program, student teachers were expected to use ICT in learning activities on campus, develop proficiency in the use of technologies in teaching their subjects, and practice teaching with ICT during their
internship in school. The integration of technologies in the study programs was expected to influence the content and methods in students’ work on campus. In addition, the University was presumed to achieve a leading edge position with respect to teaching with ICT in schools and delivering teacher education with ICT. Together, across the seven institutions involved, the PLUTO program included a vast variety of designed interventions, action research, and development projects. Students’ and teachers’ digital literacy, in general, was made a key focus, and the design of electronic portfolios and video case study methods, development of online learning courses, use of learning management systems, and use of Internet discussion forums and digital learning resources in various school subjects were parts of the development work and experimentation at different levels of teacher education.

In particular, at the University of Oslo, we focused on the implementation of a common learning management system and integrated the use of ICT in course programs, portfolio assessment, case study work, and partnerships between training schools and the University. In the follow-up research empowered by three PhD projects, the major reform artefacts—case studies, portfolios, and ICT—were highlighted as the most influential parts of the reform, and together, these contributed to creating a systemic innovation. By influencing the grounding infrastructure of teaching, the tool-mediated activities challenged the existing work structure and stimulated new approaches of teaching and learning across the academic elements of the education program.

In 2012, almost 10 years after the PLUTO initiative, the first national Centre for Excellence in Teacher Education (ProTed) was established at the University of Oslo in quite a new technological era. The overall vision of the Centre is developmental, and it focuses on the need to educate knowledgeable, confident, and internationally oriented professional teachers for a multicultural and technology-rich knowledge society. The mission is to exploit the collective competencies at two collaborating universities (the University of Oslo and the University of Tromsø) in the development of a future-oriented and knowledge-based teacher education that is organized in a five-year integrated study program.

The work of the Centre is organized around five development areas that include a separate research and development track for ICT in teaching and learning. The ICT track, together with the areas of 1) innovative practices in the subject knowledge courses, 2) partner school development, and 3) leadership and mentoring in the study programs, feed the fifth level of development: integrated study design in teacher education. A wide range of activities and development projects are designed and implemented in the diverse set of courses and program components driven by the two universities. The development strategy is to involve the various partners in experimental activities with education, in general, subject content knowledge, subject didactics, ICT and learning, approaches to teaching and
learning and study design development, and document models and experiences that inform the process of integrating knowledge in a future-oriented design perspective.

Whereas the PLUTO reform was required to invest time and resources in developing an adequate technological infrastructure, digital learning resources, and basic digital literacy among student teachers, the ProTed Centre began its work within a well-established infrastructure, with widespread laptop use by university teachers, growing use of social media, and easy access to the Internet and online learning resources. For everyone involved in the Centre’s development, the potential for the use of new technology and student teachers’ professional learning is obvious.

In observing the current ICT activities initiated by the Centre, the following three main activities are noteworthy compared with those in the PLUTO reform: 1) collaborative writing technology is tested as a production means for student teachers’ study assignments (home and term papers) in the courses of subject didactics and internship in school; 2) video/multimedia cases are developed for study purposes and integrated in the examination assignments; and 3) digital examinations are tested and scaled up for a large group of students. At the present time, the digital examination system is the most expansive part of the ICT innovations.

The system development has involved a critical analysis of the old examination task design and knowledge requirements, development of new assessment tasks adapted to the educational aims and the technology in use, and new feedback procedures for the students.

*Given your focus on technology reforms across different education levels, what would be some major lessons we can learn from educational changes in your local context and from those taking place in the global context?*

Observations of the follow-up research of the two TED reforms are aligned with those of other research on the uptake and use of ICT in secondary schools in Norway and Sweden, in which I have been involved: The life and evolvement of ICT in complex institutional settings are difficult to foresee. It depends on the institutional ability to transform the work with ICT into social and cultural practices that fulfill the objectives of education. In the long run, looking at ICT as a tool for learning in and of existing practices is not productive. The practices themselves and conceptions of learning change when ICT is used properly. When this happens, leadership and management are challenged, exams and assessment procedures are revised, if necessary, and teaching and learning designs are improved. In summary, the main lessons to be drawn from the school research and the TED reforms that I have participated in can be described as follows:

- **Ecological design**: Technology integration should be structured through the development of an ecological design approach to leadership, technology use, and learning for students, teachers, and leaders.
**Shared vision**: Technology integration should be supported through the development of a shared institutional vision of educational leadership, management, development, and learning.

**A sense of community**: Technology implementation and integration should be accompanied by the development of tools for institutional learning and by building trust, confidence, participation, and interaction across institutional levels of the community. Transparency and the sharing of ideas and experiences between individual teachers and communities, as well as continuous experimentation with innovative practices, are essential for development.

Consequently, scaling up technological reforms involves designing and redesigning educational environments from a systemic and ecological perspective. This work requires both a deliberate policy to recruit teachers and a development strategy that includes digitally knowledgeable teachers. A focus on teacher education at large indicates that the complexities of higher education institutions contribute to slowing down educational change and improvement processes. This difficult lesson challenges impatient change agents, such as I am.

**Young people (students) are the focus of educational change for improvement. From your perspective, what are the key needs of young people at this time and what might the field of educational change prioritize in order to meet these needs?**

In looking into the high drop-out rates of students in higher secondary education in many Western countries, Norway included, the question is how well the education system fits the needs of young people today. The high drop-out rate indicates that something needs to be addressed before it grows into a more serious problem and threat to the grounding thinking of education in our societies. What we have planned for and implemented in the last 50–60 years, i.e., giving all students equal opportunities in education to help them become productive citizens of the society, needs to be rethought.

The development of Western societies has placed large demands on young people, who are expected to go to school for a period of 12 to 16 years or more before entering the job market. However, even if well educated, not everyone is fortunate to land a job, and the earlier that students opt out of education, the more difficult it is for them to find a job. At the same time, the rapid technology developments and advances in high-tech knowledge work increase the difficulty of finding a job for young people who do not possess the relevant education and training. These challenges, seen together with the profound obstacles arising from the multicultural and religious diversity of societies, are creating needs to rethink the education system so that it meets the
complexities of new competencies and identities in societies.

Proposing a general recipe for educational change across the different national contexts and challenges highlighted previously is difficult. However, one option is to start the curriculum change process with a focus on the future needs of students’ learning, which has been decided in Norway for elementary and secondary education (NOU 2015). This curriculum initiative departs from the growing understanding of what competencies are needed in the future society.

How schools can support the development of students’ social and cultural identity is a vital part of the change initiatives. In this context, the question of how deep learning of subject content knowledge can be nurtured and prioritized in school is a difficult and important question to be discussed and concretized.

**What do you think are the most important issues in educational change today? What excites you about the educational change field today?**

Today, digital competency is one of the most important requirements to participate in education and work, as well as to be an active member of society. This is why the ProTed Centre, as mentioned above, has placed the use of digital technology at the core of its activity in assisting new teachers to reach out to their students in school.

However, the use of ICT in education is still in its infancy or awaiting acceptance and legitimation as a tool for learning and a way of education. A variety of contradictions between old and new designs of teaching and learning hinder people from taking advantage of the potential of ICT in schools. For example, the test and exam system has a tremendous impact on the manner of learning and assessment of student competencies, and adjusting them to fit new digital practices is difficult. At the same time, ICT in education requires further research and development on a critical basis of what schools are designed for or ought to be.

**Further reading**

List of publications with reference to the ICT research and development activities mentioned in the interview.


Further reading (Contd.)


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Trond Eiliv Hauge is Professor Emeritus of Education at the University of Oslo, Department of Teacher Education and School Research, Norway. His publications include numerous books, chapters, and journal articles in the fields of learning and new technologies, teacher education, school leadership and improvement. For many years he was working in the Norwegian Ministry of Education as a curriculum consultant. Since 1991 his main professional work has been in teacher education and in-service training of teachers and school leaders. He was the director of the National Centre of Excellence in Teacher Education until 2013.