

From splendid isolation to crossed boundaries? The futures of teacher education in the light of activity theory. ¹

Marco Snoek (Hogeschool van Amsterdam, the Netherlands)

Many policy documents addressing the future of teacher education do not take into account the fundamental unpredictability of the future, nor the opposing forces that will try to influence that future. Through the analysis of 48 scenario documents on the future of education or teacher education, we identified a set of unpredictable key factors that have to be taken into account when addressing the future of teacher education. We also identified four main futures that may lie ahead for teacher education. We analyzed these four scenarios using the concepts of activity systems, boundary objects, and boundary crossing. This revealed that the extent to which activity systems are open to boundary crossing and are willing to remove institutional boundaries, will largely define the future that lies ahead for teacher education. Future scenarios in themselves can play a role as boundary objects that facilitate the dialogue and boundary crossing between these activity systems.

Keywords: teacher education, future scenarios, activity theory, boundary objects

1. Introduction

Policy plans for teacher education are often formulated in visionary terms like Obama's "Our future, our teachers" (US department of Education 2011), Actieplan Leraar2020 (Action plan Teacher2020; Ministerie van OCW 2011), Teaching Scotland's Future (Donaldson 2010), and Austria's LehrerInnenbildung NEU – die Zukunft der pädagogischen Berufe (Teacher education NEW: the future of the pedagogical professions; Expert/innengruppe Lehrer/innenbildung NEU 2010). These titles suggest that through these policy plans, governments want to shape new futures for education in their countries. Such policy plans suggest that to create that future, it is essential to develop and improve the education of teachers. If we want to have an indication of what teacher education will look like in the coming years, we could take such policy plans (those of either governments or stakeholder groups, like teacher education institutes, teacher educators, teacher unions, etc.) as a starting point. However, the nature of these documents confronts us with two fundamental problems.

¹ A shorter version of this paper will be published in 2013 in a thematic issue of 'Teacher Development' on the future of teacher education.

The first problem is that such policy documents describe a single desirable future, which leads to the question whether this future is the only and best future we can imagine. What alternative futures can be imagined and what factors will be decisive in the way that one future will prevail over the other possible futures? This question is fundamental, as short-term thinking seems dominant in the area of education. As the long-term impact of education is fundamental in a society, it is essential to develop future-thinking perspectives to look beyond present problems and constraints, and to develop long-term sustainable policies (OECD 2007; Snoek 2003b). In these future-thinking perspectives, the fundamental unpredictability of the future and the possibility of different futures need to be taken into account

The second problem is that when a desirable future is identified, we are confronted with the question how this future can be realized. The dominant assumption underlying many policy documents is that decision makers can influence the future by measures taken by the government. This rational-central-rule approach (Gunsteren 1976) is based on the idea that through rational decisions society can be constructed and shaped according to our wishes. This assumption has been proven wrong, as illustrated by the long list of ambitious policy plans that follow one upon another in some countries. It disregards the complexity of society and the existence of opposing forces that are striving for different futures. Defining a desired future and taking policy measures toward that future, does not automatically lead to change in complex systems like teacher education. To change teacher education in a specific desired direction, we need to conceptualize how to change current systems in specific, powerful ways (OECD 2006b).

This paper focuses on the future of teacher education, as it is one of the most crucial factors in changing and developing the educational system. In doing so we will have to avoid the problems identified above. We address the first problem by analyzing futures studies in the area of education/teacher education that take into account the fundamental uncertainty of the future, and present not just one, but several alternative future scenarios. Although several scenario studies have been done in the wider context of education, only a few had a specific focus on teacher education. Through this analysis, we identify key factors that have to be taken into account when shaping the future of teacher education. In this study, scenarios are considered boundary objects that facilitate dialogue between and the change of different activity systems (Bødker and Christiansen 1997; Lebel 2010; Pulver and VanDeveer 2007). Therefore we address the second problem by using the concepts of activity systems, boundary crossing, and boundary objects to reflect on the dynamics of stakeholders and activity systems in shaping the future of teacher education.

2. Unpredictable factors and future scenarios

In their analysis of future-focused research, Codd et al. (2002) conclude that most of the future-oriented research assumes that educational systems might be improved through incremental reforms. According to Codd et al., the studies can generally be characterized by

an unquestioning endorsement of the status quo, a lack of imagination, and a lack of critique of current trends. In their analysis, they emphasize the distinction between ‘forecasting’ leading to future predictions, and ‘foresighting’ leading to alternative scenarios for the future.

Scenarios are consistent and coherent descriptions of alternative hypothetical futures that reflect different perspectives on past, present, and future developments, and can serve as a basis for action (Van Notten 2006). They are mostly narrative – in the form of stories that play out in the future – or more descriptive, describing future system characteristics. Alternative scenarios take into account the fact that developments in society are not straightforward.

The scenario method has been widely used in business and the military to plan in situations of high uncertainty (Lebel 2010) as a tool for strategic decision making or policymaking (OECD 2006b; Schwartz 1991; Van der Heijden 2005). Future scenarios as a tool for strategic thinking in education were first used at the beginning of the 1990s by the Global Business Network (Ogilvy 1992; Ogilvy 1995). Their use has since been strongly stimulated by the Schooling for Tomorrow project of the OECD, which resulted in the OECD scenarios (2001) and several follow-up projects (OECD 2006b). More recently, the scenario method has been considered a powerful tool for the awareness raising, dialogue, reflection, and collaborative learning of professionals, like teachers and teacher educators (Benammer et al. 2006; Laws and McLeod 2003; OECD 2007; Snoek 2005).

As a starting point for developing scenarios, key factors in society are identified that shape the development of society and give meaning to isolated events. These key factors, which in scenario studies are often called “driving forces,” can be found in areas like society, technology, economy, ecology, and politics. These key factors are analyzed and evaluated on their possible impact and their unpredictability (Scarce and Fulton 2004; Snoek 2003b; Van der Heijden 2005) using data from the present, for example, through careful analysis of present trends or by Delphi-type studies with panels of experts. Unpredictable key factors with high impact are used to develop alternative futures, which are usually reformulated in terms of a dichotomy or dilemma showing two possible and often opposing directions for the future. One-dimensional scenarios take one unpredictable key factor and present futures in which the impact of that key factor varies in terms of high or low. In most two-dimensional scenarios, two unpredictable key factors are formulated as dilemmas in terms of contrasting values, and are combined in a two-dimensional matrix, typically leading to one or more sets of four quadrants, each representing a scenario. In multi-dimensional scenarios, like the OECD scenarios, different unpredictable key factors are taken to their extremes and transformed into stories. As a result, the study of scenarios for the future of teacher education can provide insight into key factors that are important in the area of teacher education today, and into the subjective understanding of the authors of the scenario studies with respect to how these key factors will work out within teacher education tomorrow.

3. Activity systems, boundary objects, and boundary crossing

Scenario studies can show how the future might look like, but they do not conceptualize how systems can be changed or how a most desirable future can be realized. For this we need to understand the dynamics between stakeholders and the systems of which they are part. According to Bødker and Christiansen (1997), Pulver and VanDeveer (2007) and Lebel (2010), the notion of boundary objects provides a useful starting point for examining the role that future scenarios can play in the dynamics of change. Here, boundaries are understood as a social cultural difference between systems, practices, or social worlds, leading to a discontinuity in action or interaction between these systems. Boundary objects are artifacts that support the crossing of those boundaries by fulfilling a bridging function (Akkerman and Bakker 2011; Star 1989). In the literature on climate research, future scenarios are considered boundary objects, as their construction process requires bringing together people with different backgrounds, viewpoints, and knowledge to discuss implications in a heterogeneous group of experts, policymakers, and other stakeholders, thus bridging boundaries between systems (Lebel 2010). In this way, scenarios provide a sheltered context for the usual confusing, contesting, or conflicting debate between science (or in our case, education) and policy (Pulver and VanDeveer 2007).

The concepts of boundary crossing and boundary objects are integrated in Engeström's cultural historical activity theory on expansive learning (Engeström 2001). In this theory, learning has a very broad meaning, including new understandings, identity development, change of practices, and institutional development (Akkerman and Bakker 2011). Contrary to traditional learning theories, which focus on learning within the boundaries of a specific practice, Engeström's activity theory takes into account interactions between actors from different cultures, contexts, and activity systems. In the context of teacher education, this notion of different interacting activity systems is relevant, as the education of teachers connects several activity systems: different faculties within a teacher education institute, the school system as a context for teaching practice of student teachers or experienced teachers (Gorodetsky and Barak 2008; Tsui and Law 2007), or the policy system of the national ministry or local administration. Each of these activity systems represents different stakeholders, responsibilities, mechanisms, roles, etc.

The activity theory and the concept of boundary objects can help to understand the dynamics between different activity systems that are involved in teacher education and will have a role in shaping its future, and to understand how scenarios can support that dynamics as boundary objects, facilitating boundary crossing between different activity systems today.

4. Methodology

As we believe that policy debates on the future of teacher education could be strengthened by a more open approach that takes account of alternative futures, and by a perspective that takes into consideration the dynamics of different stakeholders and subsystems in teacher

education, we analyzed documents that present alternative scenarios for the future of education or teacher education, and reflected on these using the concepts of activity systems, boundary objects, and boundary crossing.

In this analysis, we used the following research questions:

1. What dominant futures do the scenario documents present?
2. What unpredictable key factors are identified by scenario authors as relevant to the future of teacher education?
3. What are the implications of these possible futures for the dynamics and boundaries between the different activity systems?
4. What role can scenarios play in stimulating boundary crossing between activity systems?

Selection

The first step of the analysis process was to find published scenarios for the future of education or teacher education. As the focus of our study was on future scenarios as tools for strategic thinking and policy making, and less on academic debates, we chose to use Google and Google Scholar as search engines instead of the traditional academic research databases. In our search we used the terms “scenarios” or “futures”, combined with “teacher education”, “teacher training”, “teaching”, “teaching profession”, “teachers”, “education”, “schooling”, and “learning.” In some cases, the search outcomes referred to other scenario documents that were not found in the first search, but could be included in the analysis. The decision to extend the search to such terms as “education”, “learning”, “teaching”, and “schooling” was grounded on two assumptions. First, we expected that general future scenarios for schooling, education, or learning would make little distinction between separate education sectors, and could therefore also be applied to teacher education. Second, we expected that future scenarios for education, learning, teaching, and schooling would have implications for the way in which teacher education unfolds within these scenarios.

In the final selection of documents, we used two criteria: Based on our definition of scenarios as presentations of multiple possible futures, only those publications were selected that presented two or more alternative descriptions of futures for education/teacher education. Second, only original scenario documents were selected, for example all texts referring to the OECD Schooling for Tomorrow scenarios were excluded, except for those texts that resulted from follow-up projects in which the OECD scenarios were taken as a starting point and adapted to national contexts (in England, New Zealand, English-speaking Ontario, French-

speaking Ontario, the state of South Australia and the state of Victoria, Australia²). This selection process resulted in 48 texts that met both criteria (see Appendix).

The 48 scenario publications present a broad overview of scenarios for the future of education/ teacher education published in the period 1992–2011, covering scenario studies published by national or international governmental organizations, stakeholder organizations or other non-governmental organizations and think-tanks, and academic papers where scenarios were used to categorize and present data with respect to trends in society and their possible impact on education, or to underline arguments. We decided not to restrict the timeframe of our study in order to see to what extent the key factors that were considered relevant to the future of teacher education changed over the years taking the first GBN scenario on education as a starting point (Ogilvy 1992).

Analysis

Each publication was analyzed qualitatively using a framework derived from Van Notten et al.’s classification framework for scenarios (2003). In our analysis, we used their distinction between characteristics of the *scenario process* and those of the *scenario content*. With respect to the process, we looked at the interactivity of the process of scenario development, in terms of the interaction and involvement between different stakeholders that participated in drawing the scenarios, and at the type of stakeholders that were involved. As for the content of the scenarios, we used a framework that distinguishes between the “actors” and the “factors” (Van Notten et al. 2003). Our analysis of actors focused on the key stakeholders in the scenarios and their roles, relations, and responsibilities. The factors are the unpredictable driving forces that the authors used to differentiate between the scenarios. We made a distinction between internal factors – which were part of the education system – and external factors, which were part of the wider societal system.

Classification aspect		Characteristics
Scenario process		Interactivity
		Type of stakeholders involved
Scenario content	Actors	Roles, relations, responsibilities
	Factors	Internal factors
		External factors

Table 1: Framework for analysis of the scenarios

² For brevity, scenario publications published by national agencies or ministries are referred to by using the country or state name. The full reference can be found in the list of references.

Discussion

Based on the analysis of actors and factors, we identified four futures that largely summarized the set of scenario documents. To understand the implications of these possible futures for the dynamics and boundaries between the different activity systems, we rephrased the scenarios in terms of activity systems, focusing on the activity systems of teacher education institutes and schools, and the dynamics between the two.

5. Results: Unpredictable key factors for the future of teacher education

In this section, we summarize the outcomes of the analysis of the scenario publications on education/teacher education, focusing on the scenario process and the scenario content, and identifying the actors and factors that are emphasized in the documents.

The scenario process: participation of stakeholders

Most two-dimensional or multi-dimensional scenario publications derive their power to initiate dialogue and change from the process by which a wide group of stakeholders were involved in developing the scenarios or discussing the outcomes (or both). These scenario processes were participatory in nature and involved various stakeholders, supporting a stronger validation and starting a wider dialogue between stakeholders. In several scenario projects, the process was limited to one type of stakeholder: teachers (Berry 2011; Cachia 2011; Snoek et al. 2011; Song 2008) or teacher educators (ATEERDC19 2003; Snoek 2003a) or VET-experts (Sellin 2002; Van Wieringen et al. 2003). Especially the scenario projects that were part of the OECD Schooling for Tomorrow project are based on a wider consultation and involvement of a variety of stakeholder groups, often in multiple regional sessions with parents, teachers, school leaders, business representatives, and policymakers, involving several rounds of consulting, writing, validating, and rewriting. Most of these scenario projects were initiated by governmental organizations or think-tanks. Most of the documents that present mono-dimensional scenarios are not the result of such a participatory process, as they were developed by a single expert or a small group of experts. These scenario studies derive their authority to initiate dialogue and change from the academic expert status of the author(s) or from the organization they work for, like the OECD, World Bank, or Futurelab.

A distinction can be made between scenario publications that are normative, have a particular agenda for the future, and advocate a specific most desirable future, and scenario publications that use an open approach, presenting a set of scenarios without an explicit preset preference with respect to a most desirable future. This distinction shows that scenarios can be both entry points for debate, or instruments for marketing and persuasion (Lebel 2010). In general, the one-dimensional scenarios are normative – presenting a worst-case and a most desirable scenario – while the two-dimensional and multi-dimensional scenarios are open ended, as the authors of the scenario stories have tried to write every scenario from a neutral or positive perspective (except for the “meltdown” and “schools as bureaucratic institutes” scenarios

from the OECD Schooling for Tomorrow project). These scenarios thus do not provide a specific direction toward the future and invite readers to engage in an open dialogue about alternatives and uncertainties.

The scenario content: Actors and factors

Actors: who takes the lead?

The various scenarios identify different leading actors: governments, local communities, parents, schools, teacher educator institutes, and teacher educators. Several scenarios focus on the key issue of who should take the lead in setting directions, providing guidelines, and defining structures for education/teacher education.

As education is an essential provision within a society, several scenarios envision a future in which the government plays a decisive role in defining the guidelines, content, and structure for schools, the teaching profession, and teacher education. The justification for a decisive role of the government can lie in the need for a coherent and transparent system (ATEERDC19 2003; Johnston 2000; Norwich and Lunt 2005), the need for international competition and cooperation (Willumsen 1999), the need to safeguard the quality of the educational system (Lefkowitz and Urquhart 2005; OECD 2006a; Seed 2008; Snoek 2003a), or the need to align education with economic development (Harris 2006; Johnston 2000).

Other scenarios foresee a future in which education is seen as an essential responsibility of the society, but where the driving force within the education system is not a national government, but a local community. These future scenarios emphasize the role of schools as social centers where teachers and parents work in close cooperation with a focus on inclusion, citizenship, local coherence, or parental choice (Craig and Fieschi 2007; Harris 2006; Newby 2005; Norwich and Lunt 2005; OECD 2001; OECD 2006a; Ogilvy 1992; Ogilvy 1995; Ontario-Eng 2006; Ontario-Fr 2006; Scottish Enterprise Glasgow 2006; South Australia 2006; Victoria 2006; New Zealand 2006).

A third set of scenarios describe a future in which teacher education is dominated by the customers – those who have to benefit from the outcomes of learning processes. This might be the parents, pupils, or students, who wish to have maximum freedom of choice with respect to learning arrangements according to their specific needs or preferences (Norwich and Lunt 2005; Victoria 2006), or the labor market as the future employers of graduates. In futures where the employers of graduates are leading, schools are focused learning organizations (New Zealand 2006; OECD 2001; Ontario-Fr 2006; South Australia 2006; Victoria 2006) that define their needs and expect teacher education institutes to adapt their curricula according to those needs (ATEERDC19 2003).

Scenarios in which the customers are leading fit within a neoliberal market model scenario, in which education is dominated by market forces, and traditional education institutes and commercial companies compete to enroll as many pupils or students as possible and to gain a maximum market share. In such a scenario, education is a commodity and education institutes

will commercialize and compete in educational entrepreneurship (Freeman and Watson 2008; Miller 2003; New Zealand 2006; Newby 2005; OECD 2001; OECD 2006a; Ogilvy 1992; Ontario-Eng 2006; Ontario-Fr 2006).

A different future is foreseen in scenarios in which teachers or teacher educators take the lead as professionals, setting directions based on an extended professionalism through strong professional networks or councils (Berry 2011; KnowledgeWorks 2011; Niemi 2000; Saussois 2006; Schmelkes 2008; Seed 2008; Snoek 2003a; Snoek et al. 2011).

A last set of scenarios describes a possible future that is not dominated by one specific dominant stakeholder in terms of national or local governments, the customers, the educational providers, or the teaching profession, but is characterized by networking in flexible and decentralized communities without formal hierarchies. Such scenarios are inspired by network and complexity theories (Cachia 2011; New Zealand 2006; Newby 2005; OECD 2001; OECD 2006a; Ogilvy 1992; Ontario-Eng 2006; Ontario-Fr 2006; Saussois 2006; Victoria 2006).

Looking at these scenario sets, we can identify four typical and dominant scenarios, namely those focusing on bureaucracy, a market model, the professionalism of teachers/teacher educators, or decentralized networks.

- Bureaucracy (leading governments or local communities)
- Market model (parents/students or employers as customers and commercialized institutes)
- Professionalism (collective self-steering by teachers or teacher educators)
- Networked (flexible decentralized networks crossing institutional borders)

Table 2: Four dominant scenarios based on the roles and responsibilities of stakeholders

Factors: internal structures

All scenario documents take one or more internal factors or driving forces with high impact and high unpredictability, to create the fundamental differences between the alternative scenarios. In most scenarios, these factors are formulated in terms of dichotomies or dilemmas, either explicitly in terms of axes in the scenario matrix, or more implicitly in contrasting scenario stories.

In the analysis of the internal factors, we made a distinction between factors relating to the central aims within the education system (e.g., focusing on economic development, on individual opportunities, or on social cohesion), factors regarding the curriculum content (e.g., with respect to a narrow or wide interpretations of learning aims, or a reproductive or productive focus on knowledge), factors related to the pedagogy of teaching and learning (e.g., concerning the recognition of informal learning, the room for individual learning paths, the role of virtual learning environments, and the recognition of collaborative learning), and factors relating to organizational structures (e.g., the room for choice of parents or students, the amount of trust or control and its relation to detailed regulations and testing, the role of

formalized hierarchical organization structures, the permeability of institutional boundaries, or the institutional adaptivity and openness to change) (see table 3).

Internal factor	Scenario publication
Aims	
• Economy	Harris 2006; Miller 2003; Moynagh and Worsley 2003; Van Wieringen et al. 2003
• Individual, elitist	ATEERDC19 2003; Facer 2009; Lefkowitz and Urquhart 2005; New Zealand 2006; Norwich and Lunt 2005; Schmelkes 2008; Scottish Enterprise Glasgow 2006; Victoria 2006
• Communal, inclusive	ATEERDC19 2003; Facer 2009; KnowledgeWorks 2011; Lefkowitz and Urquhart 2005; New Zealand 2006; OECD 2001; Ogilvy 1995; Ontario-Fr 2006; Schmelkes 2008; Scottish Enterprise Glasgow 2006; Van Wieringen et al. 2003; Victoria 2006
Curriculum	
• Narrow (knowledge) vs. wide (including attitudes and values)	Kirk 2009; Schmelkes 2008
• Reproductive (focus on testing) vs. productive learning (pupil/student as prosumer)	Seed 2008; Snoek et al. 2011
Pedagogy	
• Restricted to formal learning vs. recognition of informal learning	KnowledgeWorks 2011; New Zealand 2006; Newby 2005; South Australia 2006
• Standardized (closed) vs. individual tailor-made learning (open)	ATEERDC19 2003; Kirk 2009; Lefkowitz and Urquhart 2005; Saussois 2006; Snoek et al. 2011
• Face-to-face vs. virtual and online learning	Berry 2011; Bigum and Kenway 1998; Cachia 2011; Daanen and Facer 2007; Moon et al. 2005; Schuck and Aubusson 2010; Volman 2005
• Individual, isolated learning vs. collaborative learning in communities	Berry 2011; Business Educa 2011; Cachia 2011; KnowledgeWorks 2011; New Zealand 2006; Newby 2005; OECD 2001; Ontario-Eng 2006; Ontario-Fr 2006; Volman 2005
Organizational structure	
• Standardized vs. diversified with individual choice	ATEERDC19 2003; Lefkowitz and Urquhart 2005; New Zealand 2006; Newby 2005; Norwich and Lunt 2005; Ogilvy 1995; Sellin 2002; Victoria 2006; Willumsen 1999
• Controlled through prescriptions, regulations, and tests vs. trusted with freedom for teachers	Goodwin et al. 2011; Johnston 2000; Lefkowitz and Urquhart 2005; Leicester et al. 2009; Saussois 2006; Seed 2008
• Hierarchical structures based on formal roles and credentials vs. informal structures based on personal merits and informal teacher leadership	Business Educa 2011; Miller 2003; Saussois 2006
• Compartmentalized and institutionalized structures characterized by boundaries vs. fluid, integrated, and intertwined structures	Geake and Cooper 2003; Niemi 2000; South Australia 2006; Young and Muller 2010
• Adaptivity and openness to change	Facer 2009; Goodwin et al. 2011; Kirk 2009; Leicester et al. 2009; Moon et al. 2005; Taylor et al. 2007

Table 3: Internal factors influencing the future of education/teacher education

Factors: external context

Several scenarios focus on external factors that will influence the future of education/teacher education (see table 4). This concerns the economic context and developments in the world of work and professions, the status and appreciation of education and teachers by society, and macro developments like globalization or technological developments. Although these factors cannot easily be influenced by stakeholders in the area of education, scenario authors foresee that they might have a large impact on the future of education/teacher education.

External factor	Scenario publication
Abundance vs. scarcity of teachers	Bennell 2004; OECD 2001
High vs. low status of teachers	OECD 2001
High vs. low willingness of governments to invest in education/teacher education	Moynagh and Worsley 2003; OECD 2001
High vs. low speed of technological development and implementation in education	Daanen and Facer 2007; Lefkowitz and Urquhart 2005; Ogilvy 1992
High vs. low competitiveness of the work sector	Van Wieringen et al. 2003
High vs. low extent of globalization	Johnston 2000; Scottish Enterprise Glasgow 2006; Victoria 2006
Growth vs. decline of economy, high vs. low resources	Freeman and Watson 2008; Hume 2007; Lefkowitz and Urquhart 2005; Moon et al. 2005; Schmelkes 2008; Taylor et al. 2007; Van Wieringen et al. 2003

Table 4: External factor influencing the future of education/teacher education

6. Discussion

Here, we summarize our findings and, using the concepts of activity system, boundary crossing, and boundary objects, draw conclusions with respect to the possible futures for teacher education and the dynamics between the activity systems in each of these futures.

Focus on the future of teacher education

In the search process to select scenario documents, we included such terms as education, schooling, and teachers. Of the 48 documents, only seven documents address teacher education directly, four documents address the future of higher education in general, and four documents explicitly address teachers' professional development, for example through networking (Cachia 2011) and teacher professionalism (Craig and Fieschi 2007; Snoek et al. 2011). Most of the other texts address the education system or the teaching profession in general. However, as teacher education is part of the same system as schools, it is influenced by the same key factors. Snoek and Wielenga (2003) showed, for example, how all six OECD scenarios on education systems in general can be recognized in developments in teacher education in the Netherlands.

But at the same time, teacher education contributes to maintaining or changing the system by educating the teachers who are part of that system. Future development in the education

system and in the teaching profession will therefore have an impact on what is expected from the teacher education curriculum. This implies that redesigning the future of schools and the education system, entails redesigning teacher education.

Scenarios as boundary objects

If scenario studies are to function as boundary objects helping to bridge intersecting practices – such as the activity systems of teacher education institutes, schools, and policy agencies – it is essential that they support communication by creating a shared understanding of driving forces and by supporting dialogue. The majority of the scenario projects, especially those within the context of the OECD Schooling for Tomorrow project, were characterized by intensive interactive dialogues between various stakeholders during the development or validation of the scenarios, or in discussions on the most desirable future. Other projects aimed at engaging a specific group of stakeholders (e.g., teachers) who have traditionally had marginalized voices in the policy debate. As such, these scenario projects functioned as boundary objects, bringing together stakeholders, bridging their activity systems, and supporting the dialogue in search of shared values. However, given the scope of our analysis, we cannot assess how successful these scenario projects were in facilitating this boundary crossing.

In a quarter of the documents, the scenarios were developed by academics for academic publications, without involving other stakeholders. The extent to which such scenarios act as boundary objects, facilitating boundary crossing and dialogue between different stakeholders, is limited, especially when publication is restricted to academic journals.

Actors and their activity system: four dominant scenarios

Based on our analysis of the actors and their roles, responsibilities, and interactions in the various scenario documents, we identified four dominant types of interaction, namely interaction based on bureaucratic hierarchies, a market model, professional self-steering, and boundary crossing networks. Each of these can be translated into a typical future scenario for teacher education, with differences in the way in which the three activity systems that are involved in the education of teachers (the activity system of teacher education institutes, the activity system of schools, and the activity system of policymaking) interact with each other.

In a bureaucratic future, the activity system of policymaking is the most dominant and the most unlikely to change, as it sets the context for the other two activity systems, influencing the artifacts and rules of these two systems. The interaction between the activity systems of school and teacher education institutes will be limited, as they are addressed separately by the activity system of policymaking. Boundary activities are mostly shaped in terms of imposed regulations and negotiations between policymakers and pressure groups from the other two activity systems.

In a market-oriented future for teacher education, the activity system of the school is the most dominant and the least likely to change. The demands for teacher quality and for professional

development are defined within that system. The activity system of teacher education institutes needs to adapt to those demands, as survival requires flexibility in the provision of courses and curricula. The activity system of policymaking is limited to creating the conditions for the interaction between the other two activity systems.

In a future that is dominated by the professionalism of teacher educators, the interactions between the three activity systems depend on how this professionalism is defined. If it is based on a narrow definition of professionalism, the activity system of teacher education institutes will focus on its autonomy with respect to the other activity systems. In that case, the boundary crossings between the three activity systems will be limited.

In these three possible futures, the most important boundary crossing between the activity system of the teacher education institute and that of the school will be done by teachers, educated (either pre-service or in-service) within one system with rules and artifacts that are focused on innovative didactics, professional development through learning and reflection, and research, while they are expected to perform within another system with other rules and artifacts that are governed by timetables and focused on exam results and collegial consensus. This boundary crossing will not be without tensions. Whether this boundary crossing will lead to a change of activity systems can be doubted. The most likely is that the boundary crossers – whether student teachers, novice teachers, or experienced teachers engaged in in-service programs – will quickly adapt themselves to the rules and values of the activity system they are in. Despite many attempts in the past to bridge these two activity systems and to create intense partnerships, in many cases schools merely serve as “practice fields” for pre-service teachers, without establishing shared cultural norms between teacher education institutes and school (Gorodetsky and Barak 2008). Niemi (2000) identifies as one of the main challenges for the future of teacher education, the fact that the current system is based on a rationalization process that has created social structures that keep teaching and learning cultures as unchangeable, leading to new teachers who continue to follow old traditions.

The dominance of institutional structures is taken for granted and reinforced in each of the three futures described above. Each activity systems is focused on the primary output of its own system (graduated student teachers, exam results of pupils, or the efficiency and quality of the system as a whole), and communities in each of the activity systems are exclusive with little or no overlap.

In the fourth possible future for teacher education, these institutional structures are replaced by a network structure in which the activity systems of teacher education institutes and schools are integrated in a new activity system that focuses not on institutional boundaries, but on the process of teacher development. In this activity system, teacher educators, student teachers, and experienced teachers cooperate, with the support of school leaders and heads of department, in mixed communities of practice that are characterized by rules and values supporting curiosity, innovation, and development, and where mediating artifacts support the bridge between teaching practice and research. Examples of such structures can be found in various places, such as “edge communities” (Gorodetsky and Barak 2008), academic training

schools in the Netherlands (Snoek and Moens 2011) and school-embedded Master's programs (Cornelissen 2011), supported by cross-institutional learning communities as mediating artifacts (Samaras et al. 2008).

Key factors and dilemmas

Through the selection of a limited number of key factors, the scenario publications reduce the complexity of reality to one or two key factors that are presented as dichotomies in terms of either/or. This is both their strength – highlighting topics and uncertainties – and their weakness, disregarding the complexity of reality, which might include a third option or a complex mixture of both. At the same time, by making the underlying assumptions explicit, the scenarios sometimes show a new option. In discussions on teacher education, the emphasis is often on the responsibility of the government to guarantee that all teacher graduates meet the minimum standards for teachers, on a market perspective of providers and customers in terms of schools or students, or on the autonomy of universities. These three perspectives coincide with the first three scenarios, reflecting the logics of the bureaucracy, the free market, and the professional, as identified by Freidson (2001). However, several scenario texts suggest that in the future there might be a fourth logic, namely one that is characterized by interactive and dynamic multidisciplinary networks crossing institutional boundaries, based on network and complexity theory.

The key factors that we found in our analysis seem to have remained rather constant over the last 20 years: We found similar factors in both older and newer scenario documents. Most of these key factors are formulated in terms of a dilemma, whereby a choice has to be made. Which choice is considered the most desirable will depend on the perspective of the stakeholder and the values the stakeholder endorses. As in the four scenarios different stakeholders will have a leading position, the future direction regarding the key factors will be imposed differently on the other stakeholders. A lack of ongoing dialogue that crosses the boundaries between the activity systems will create ongoing tensions in the first three scenarios.

Limitations

Our analysis has a major limitation in that we looked only at scenario publications or references that were available online and could be connected to English search terms. Less than a quarter of the scenario documents are translations from scenario studies in other languages, or are focused on a non-Anglo-Saxon context (ATEERDC19 2003; Bennell 2004; Moon et al. 2005; Ontario-Fr 2006; Schmelkes 2008; Snoek et al. 2011; Song 2008; Taylor et al. 2007; Volman 2005; Willumsen 1999). As a result, the analysis was dominated by issues originating from an Anglo-Saxon culture and context.

A second limitation is that not all of the documents provided a full insight into the process of scenario development, and in some cases we had to deal with what little information could be extracted from the documents.

The third limitation is that our main focus was on the unpredictable key factors that defined the differences between the presented futures. The focus of the analysis was on the resulting scenarios, and not on the full process of developing the scenarios. As a consequence, other factors that were taken into consideration during the scenario process, but were not considered unpredictable or were not selected as key factors, were not included in the analysis. The follow-up to the scenario process was also not part of the analysis. The outcomes of dialogues and the impact of the scenario process on policies and new directions, and therefore the impact of future scenarios as boundary objects, are interesting in themselves, but were not part of the analysis.

7. Conclusion

The analysis of future scenarios led to four main futures, namely futures dominated by a bureaucratic government, a market focus of schools and teacher education institutes, self-steering professionals, or a network approach unhindered by institutional boundaries. The first two futures have the closest resemblance to today's situation, in which teacher education is confronted with an ongoing list of reform measures from governments, and higher education is increasingly dominated by market approaches. The third future might be an attractive one from the perspective of teacher educators, but a condition is that teacher educators develop a collective identity, which does not seem the case yet (Snoek, Swennen, and van der Klink 2011; Swennen 2012). In all three scenarios, the activity systems continue to exist in isolation. The fourth future – the one based on networks – seems the most imaginative, transformative, and powerful when it comes to crossing boundaries, but it is also the most rigorous as it rearranges and transforms the existing boundaries and activity systems. In this last scenario, boundaries are not crossed, but removed.

Whether such a future lies ahead, depends on the strength of existing pilot projects and their power to survive and grow in a system that is still dominated by institutional boundaries and interests, and on the courage of all stakeholders in the area of teacher education to take the lifelong and holistic process of teacher development as a focal point.

References

- Akkerman, S. F., and A. Bakker. 2011. Boundary crossing and boundary objects. *Review of Educational Research* 81 (2): 132-69.
- ATEERDC19. 2003. Scenarios for the future of teacher education in Europe. *European Journal of Teacher Education* 26 (1): 21-36.
- Benammer, K., L. Dale, J. Poortinga, H. Schwab, and M. Snoek. 2006. *The scenario method for education. Facilitator manual*. Amsterdam: Hogeschool van Amsterdam.

- Bennell, P. 2004. *AIDS in Africa: Three scenarios for the education sector. Report prepared for the UNAIDS project, AIDS in Africa: Scenarios for the future.* Geneva: UNAIDS.
- Berry, B. 2011. *Teaching 2030: What we must do for our students and our public schools: Now and in the future.* New York: Teachers College Press.
- Bigum, C., and J. Kenway. 1998. New information technologies and the ambiguous future of schooling - some possible scenarios. In *International handbook of educational change, part 1.*, eds. A. Hargreaves, A. Lieberman, M. Fullan and D. Hopkins. Vol. 2, 375-395. Dordrecht: Kluwer.
- Bødker, S., and E. Christiansen. 1997. Scenarios as springboards in CSCW design. In *Social science, technical systems, and cooperative work: Beyond the great divide.*, eds. G. C. Bowker, S. L. Star, W. Turner and L. Gasser, 217-233. Mahwah, NJ: Lawrence Erlbaum Associates.
- Business Educa. Learning scenarios. 2011 [cited July/15 2012]. Available from <http://learningscenarios.org/>.
- Cachia, R. 2011. *How do we foresee teacher collaboration networks in 2025?* Sevilla: European Commission Joint Research Centre/Institute for Prospective Technological Studies.
- Codd, J. A., M. Brown, J. Clark, J. McPherson, H. O'Neill, J. O'Neill, H. Waitere-Ang, and N. Zepke. 2002. *Review of future-focused research on teaching and learning.* Wellington: Ministry of Education New Zealand.
- Cornelissen, F. 2011. *Knowledge processes in school-university research networks. Dissertation.* Eindhoven: Eindhoven School of Education.
- Craig, J., and C. Fieschi. 2007. *DIY professionalism: Futures for teaching.* London: DEMOS.
- Daanen, H., and K. Facer. 2007. *2020 and beyond: Future scenarios for education in the age of new technologies.* Berkshire: Futurelab.
- Donaldson, G. 2010. *Teaching Scotland's future. Report of a review of teacher education in Scotland.* Edinburgh: Scottish Government.
- Engeström, Y. 2001. Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of Education and Work* 14 (1): 133-56.
- Expert/innengruppe Lehrer/innenbildung NEU. 2010. *LehrerInnenbildung NEU. Die Zukunft der pädagogischen Berufe. Die Empfehlungen der ExpertInnengruppe.*[Teacher education NEW. The future of the pedagogical professions. Recommendations of the expertgroup]. Vienna: BMUKK/BMWF.
- Facer, K. 2009. *Educational, social and technological futures: A report from the Beyond Current Horizons programme.* Slough (UK): Futurelab.
- Freeman, O., and R. Watson. 2008. *Teaching for uncertain futures. The Open Book Scenarios - a project exploring possible futures of teaching.* Canberra: Teaching Australia - Australian Institute for Teaching and School Leadership Limited.
- Freidson, E. 2001. *Professionalism, the third logic.* Oxford: Blackwell publishers.
- Geake, J., and P. Cooper. 2003. Cognitive neuroscience: Implications for education? *Westminster Studies in Education* 26 (1): 7-20.
- Goodwin, B., L. Lefkowitz, C. Woempner, and E. Hubbell. 2011. *The future of schooling. Educating America in 2020.* Aurora, CO: McREL.
- Gorodetsky, M., and J. Barak. 2008. The educational-cultural edge: A participative learning environment for co-emergence of personal and institutional growth. *Teaching and Teacher Education* 24 (7): 1907-18.

- Gunsteren, H. R. 1976. *The quest for control: A critique of the rational-central-rule approach in public affairs*. London: Wiley.
- Harris, G. 2006. *The future of public primary education in the United States*. San Francisco: GBN.
- Hume, W. R. 2007. *UC2025: The power and promise of ten*. Oakland CA: University of California.
- Johnston, R. 2000. *Focus on the future of vocational education & training. Scenario planning project, an ANTA national project*. Melbourne: Victorian Office of Employment, Training and Tertiary Education.
- Kirk, D. 2009. *Physical education futures*. London: Routledge.
- KnowledgeWorks. 2020 Forecast: Creating the future of learning. 2011 [cited July/15 2012]. Available from <http://futureofed.org/>.
- Laws, K., and R. McLeod. 2003. Cultural change in organizations through the use of scenario analysis: Some research findings. Paper presented at Proceedings of ICSTM2000: International Conference on Systems Thinking in Management, Nov. 2000. CEUR-WS, Geelong.
- Lebel, L. 2010. *Scenarios as boundary objects in the allocation of water resources and services in the Mekong region*. USER working paper PN67-2010-21. Chiang Mai: Unit for Social and Environmental Research, Chiang Mai University.
- Lefkowitz, L., and V. Urquhart. 2005. *The future of schooling: Educating America in 2014*. Aurora, CO: McREL.
- Leicester, G., K. Bloomer, and D. Stewart. 2009. *Transformative innovation in education*. Triarchy Press Ltd.
- Miller, R. 2003. The future of the tertiary education sector: Scenarios for a learning society. Paper prepared for the OECD/Japanese Seminar on the Future of Universities, 11-12 December 2003, in Tokyo.
- Ministerie van OCW. 2011. *Actieplan Leraar 2020. Een krachtig beroep! [Action plan Teacher 2020. A powerful profession!]*. The Hague: Ministerie van OCW.
- Moon, B., J. Leach, and M. P. Stevens. 2005. *Designing open and distance learning for teacher education in sub-saharan Africa: A toolkit for educators and planners*. Washington: The World Bank.
- Moynagh, M., and R. Worsley. 2003. *Learning from the future: Scenarios for post-16 learning*. Hertford: Learning & Skills Research Centre.
- New Zealand Ministry of Education. 2006. The secondary futures project. In *Think scenarios, rethink education.*, ed. OECD, 145-154. Paris: OECD.
- Newby, M. 2005. Looking to the future. *Journal of Education for Teaching* 31 (4): 253-61.
- Niemi, H. 2000. Teacher education in Finland - current trends and future scenarios. Proceedings of the Conference on Teacher Education Policies in the European Union and Quality of Lifelong Learning, 22 and 23 May 2000, Loulé, Portugal. Lisbon: European Network on Teacher Education Policies.
- Norwich, B., and I. Lunt. 2005. Future schooling that includes children with SEN/disability: A scenario planning approach. Paper presented at Future Schooling for SEN/Disability, Policy seminar, 22 Sept 2005, Institute of Education, London University, NASEN, London.
- OECD. 2007. The starters pack: Futures thinking in action. Paris: OECD. <http://www.oecd.org/dataoecd/44/55/38981492.pdf> .
- . 2006a. *Four future scenarios for higher education*. Paris: OECD.
- . 2006b. *Think scenarios, rethink education*. Paris: OECD.

- . 2001. *What schools for the future?* Paris: OECD.
- Ogilvy, J. 1995. Education & community: Four scenarios for the future of public education. *The Deeper News (Global Business Network)* 6 (1): 1-34.
- . 1992. Three scenarios for higher education. *The Deeper News (Global Business Network)* 3 (1): 3-35.
- Ontario Ministry of Education - English-speaking system. 2006. The future of "teaching as a profession". In *Think scenarios, rethink education.*, ed. OECD, 155-166. Paris: OECD.
- Ontario Ministry of Education - French-speaking system. 2006. The vision 2020 initiative. In *Think scenarios, rethink education.*, ed. OECD, 167-181. Paris: OECD.
- Pulver, S., and S. VanDeveer. 2007. Global environmental futures interrogating the practice and politics of scenarios. Background paper presented at the conference "Global environmental futures - interrogating the practice and politics of scenarios", March 23-24, 2007, in Providence, RI.
- Samaras, A. P., A. R. Freese, and C. Kosnik. 2008. *Learning communities in practice*. Springer Verlag.
- Saussois, J. M. 2006. Scenarios, international comparisons, and key variables for educational scenario analysis. In *Think scenarios, rethink education.*, ed. OECD, 53-67. Paris: OECD.
- Scarce, D., and K. Fulton. 2004. *What if?: The art of scenario thinking for nonprofits*. San Francisco: Global Business Network.
- Schmelkes, S. 2008. Tomorrow's schools in Mexico: Three scenarios. *Journal of International Cooperation in Education* 11 (1): 97-112.
- Schuck, S., and P. Aubusson. 2010. Educational scenarios for digital futures. *Learning, Media and Technology* 35 (3): 293-305.
- Schwartz, P. 1991. *The art of the long view*. New York: Doubleday.
- Scottish Enterprise Glasgow. 2006. *Learning futures - new design for learning. Initial report*. Glasgow: Scottish Enterprise Glasgow.
- Seed, A. H. 2008. Redirecting the teaching profession. *Phi Delta Kappan* 14 (4): 586-9.
- Sellin, B. 2002. *Scenarios and strategies for vocational education and lifelong learning in Europe: Summary of findings and conclusions of the joint CEDEFOP/ETF project (1998-2002). CEDEFOP panorama series 40*. Luxembourg: Office for Official Publications of the European Commission.
- Snoek, M. et al. Leraar 2020 [Teacher 2020]. 2011 [cited July/15 2012]. Available from www.leraar2020.nl.
- Snoek, M. 2005. *Scenario writing in education. Teaching guidelines for an in-service course for teachers and teacher educators*. Brussels/Amsterdam: ATEE/HvA.
- . 2003a. Scenarios for Dutch teacher education. A trip to Rome: Coach bus company or travel agency? *European Journal of Teacher Education* 26 (1): 123-35.
- . 2003b. The use and methodology of scenario making. *European Journal of Teacher Education* 26 (1): 9-19.
- Snoek, M., and E. Moens. 2011. The impact of teacher research on teacher learning in academic training schools in the Netherlands. *Professional Development in Education* 37 (5): 817-35.
- Snoek, M., A. Swennen, and M. van der Klink. 2011. The quality of teacher educators in the European policy debate: Actions and measures to improve the professionalism of teacher educators. *Professional Development in Education* 37 (5): 651-64.

- Snoek, M., and D. Wielenga. 2003. Teacher education in the Netherlands, change of gear. In *Institutional approaches to teacher education in the Europe region: Current models and developments. Studies in higher education series.*, ed. L. Barrows. Bucharest: UNESCO/CEPES.
- Song, H. 2008. Four scenarios of leapfrog for teacher training curriculum in China. *Futures Research Quarterly* 24 (1): 45.
- South Australia DECS. 2006. *Creating the future*. Adelaide: Department for Education and Children's Services, South Australia.
- Star, S. L. 1989. The structure of ill-structured solutions: Boundary objects and heterogeneous distributed problem-solving. In *Distributed artificial intelligence.*, eds. L. Gasser, M. Huhns. Vol. 2, 37-54. San Mateo, CA: Morgan Kaufmann.
- Swennen, J. M. H. 2012. *Van oppermeesters tot docenten hoger onderwijs: De ontwikkeling van het beroep en de identiteit van lerarenopleiders. Doctoral thesis* [The development of the profession and identity of teacher educators]. Amsterdam: Vrije Universiteit.
- Taylor, N., B. Fleisch, and J. Shindler. 2007. Education scenarios for 2019. Paper prepared for the key driving forces scenarios 2019, 11-12 June 2007, The office of the presidency South Africa.
- Tsui, A., and D. Y. K. Law. 2007. Learning as boundary-crossing in school-university partnership. *Teaching and Teacher Education* 23 (8): 1289-301.
- U.S. Department of Education. 2011. *Our Future, Our Teachers: The Obama Administration's Plan for Teacher Education Reform and Improvement*. Washington D.C.: U.S. Department of Education.
- Van der Heijden, K. 2005. *Scenarios: The art of strategic conversation*. London: Wiley.
- Van Notten, P. 2006. Scenario development: A typology of approaches. In *Think scenarios, rethink education*. ed. OECD, 69-92. Paris: OECD.
- Van Notten, P. W. F., J. Rotmans, M. Van Asselt, and D. S. Rothman. 2003. An updated scenario typology. *Futures* 35 (5): 423-43.
- Van Wieringen, F., B. Sellin, and G. Schmidt. 2003. *Future education: Learning the future. Scenarios and strategies in Europe*. Luxembourg: Office for Official Publications of the EC.
- Victoria Office of Learning and Teaching. 2006. *Using future thinking tools to build school and system thinking and leadership. Initial and interim report*. Melbourne: Victorian Department of Education and Training, State of Victoria.
- Volman, M. 2005. A variety of roles for a new type of teacher: Educational technology and the teaching profession. *Teaching and Teacher Education* 21 (1): 15-31.
- Willumsen, J. 1999. Educational scenarios - Denmark as a leading country? On the latest developments in teacher education in Denmark. *TNTEE Publications 2 Teacher Education in Europe in the late 1990s: Evaluation and quality* 2 (2): 95-102.
- Young, M., and J. Muller. 2010. Three educational scenarios for the future: Lessons from the sociology of knowledge. *European Journal of Education* 45 (1): 11-27.

APPENDIX: Data set of scenario publications on education/teacher education

	Title	Authors	Year	Organization	Sector	Normative/ descriptive	Scenario type
1	Three scenarios for higher education in CA	Jay Ogilvy	1992	NEA/GBN	Higher education & society	Descriptive	Multi-dimensional
2	Education and community: Four scenarios for the future of public education	Jay Ogilvy	1995	NEA/GBN	Education & society		Two-dimensional
3	New information technologies and the ambiguous future of schooling — some possible scenarios	Chris Bigum & Jane Kenway	1998		Teachers' adaptation of ICT	Descriptive	One-dimensional
4	Educational scenarios - Denmark as a leading country? On the latest developments in teacher education in Denmark	John Willumsen	1999	Untervisingministeriet Denmark	Education & society DK	Descriptive	Two-dimensional
5	Teacher education in Finland: current trends and future scenarios	Hannele Niemi	2000		Boundary TE & school		
6	Glasgow's learning futures		2000	Scottish Enterprise Glasgow	Education & society	Descriptive	Two-dimensional
7	Focus on the future of VET	Ron Johnston	2000	Victoria	VET & society	Descriptive	Two-dimensional
8	Schooling for Tomorrow	OECD	2001	OECD	Education & society	Descriptive/ normative	Multi-dimensional
9	Teacher education in Europe	ATEE-RDC19	2001	ATEE	TE & society	Descriptive	Two-dimensional
10	Future education: learning the future. Scenarios and Strategies in Europe	Fons Van Wieringen, Burkart Sellin & Ghislaine Schmidt	2002	CEDEFOP/ ETF	VET & society	Descriptive	Two-dimensional
11	Scenarios and strategies for vocational education and lifelong learning in Europe	Burkart Sellin	2002	CEDEFOP/ ETF	VET & society	Descriptive	Two-/one-dimensional
12	Scenarios for Dutch teacher education: A bus trip to Rome	Marco Snoek	2003	Dutch Association for Teacher Educators VELON	TE & society in NL	Descriptive	Two-dimensional
13	Cognitive Neuroscience: implications for education?	John Geake & Paul Cooper	2003		Teachers & neurosciences	Normative	One-dimensional
14	The future of the tertiary education sector: Scenarios for a learning society	Riel Miller	2003	OECD	Higher education & society	Descriptive	Two-dimensional
15	Learning from the future: Scenarios for post-16 learning	Michael Moynagh & Richard Worsley	2003	The Tomorrow project, UK	Upper-secondary education & society	Descriptive	Two-dimensional
16	AIDS in Africa: three scenarios for the education sector	Paul Bennell	2004	UN AIDS	AIDS in Africa & teacher workforce	Normative	One-dimensional

17	Three scenarios for teacher education at a distance	Bob Moon, Jenny Leach & Mary-Priscilla Stevens	2005	World Bank	ODL in South Africa	Normative	One-dimensional
18	A variety of roles for a new type of teacher: Educational technology and the teaching profession	Monique Volman	2005		Teachers & ICT	Descriptive	One-dimensional
19	The future of schooling. Educating America in 2014	Bryan Goodwin et al	2005	McREL	Education & society	Descriptive	Multi-dimensional
20	Future schooling that includes children with SEN / disabilities: a scenario planning approach.	Brahm Norwich & Ingrid Lunt	2005	SEN policy options steering group UK	SEN & the school system	Descriptive	Two-dimensional
21	Scenarios, international comparisons, and key variables for educational scenario analysis	Jean-Michel Saussois	2006	OECD	Education & society	Descriptive	Two-dimensional
22	Teaching as a profession – Ontario – English speaking (Schooling for Tomorrow project)		2006	Ministry of Education, Ontario (English-speaking community)	Education & society	Descriptive	Multi-dimensional
23	Vision 2020 – Ontario – French speaking (Schooling for Tomorrow project)		2006	Ministry of Education, Ontario (French-speaking community)	Education & society	Descriptive	Multi-dimensional
24	Secondary futures, New Zealand (Schooling for Tomorrow project)		2006	NZ ministry of Education	Secondary education & society	Descriptive	Multi-dimensional
25	Looking into the futures (Schooling for Tomorrow project)	Mike Newby	2006	Teaching 2020 – ITE Futures TTA/TDA	TE & society	Descriptive	Multi-dimensional
26	South Australia – Creating the future (Schooling for Tomorrow project)		2006	South Australia	Education & society	Descriptive	Multi-dimensional
27	Focus on the future – Victoria (Schooling for Tomorrow project)		2006	State of Victoria, Australia	Education & society	Descriptive	Multi-dimensional
28	Four future scenarios for higher education		2006	OECD	Higher education & society	Descriptive	Multi-dimensional
29	The future of public primary education in the US	Gerald Harris	2006	GBN/Scholl foundation/PEN	Primary education & society	Descriptive	Two-dimensional
30	UC2025 - The power and promise of ten	Wyatt Hume et al.	2006	University of California	Higher education & society	Normative	One-dimensional
31	Do it Yourself professionalism Scenarios for teaching	John Craig & Catherine Fieschi	2007	DEMOS, General Teaching Council of England	Teacher professionalism	Normative	One-dimensional
32	Education scenarios for 2019	Nick Taylor, Brahm Fleisch & Jennifer Shindler	2007	South Africa 2007	Sustainability of the education system in South Africa	Normative	One-dimensional
33	2020 and beyond: Future scenarios for education in the age of new technologies	Hans Daanen & Keri Facer	2007	Futurelab	Education & ICT	Normative	One-dimensional
34	Teaching for uncertain futures: Open Book Scenarios	Oliver Freeman & Richard Watson	2008	Neville Freeman Agency & Teaching Australia	Education in socio-economic perspective	Normative	One-dimensional

35	Four scenarios of Leapfrog for teacher training curriculum in China	Hongzhuan Song	2008		TE curricula & teacher identity	Normative	One-dimensional
36	Tomorrow's schools in Mexico: Three scenarios	Sylvia Schmelkes	2008		Education, equity, & quality in Mexico	Normative	One-dimensional
37	Redirecting the teaching profession in the wake of A Nation at Risk and NCLB	Allen H. Seed	2008		Education, testing, & trusting	Normative	One-dimensional
38	2020 Forecast: Creating the future of learning		2008-2011	KnowledgeWorks	Education & society	Normative	One-dimensional
39	Transformative innovation in education	Graham Leicester, Keir Bloomer & Denis Stewart	2009	International Futures Forum	Schools & change	Normative	One-dimensional
40	Beyond current horizons	Keri Facer	2009	Futurelab	Education & society	Descriptive	Two-dimensional
41	Physical education futures	David Kirk	2009		Physical education	Normative	One-dimensional
42	Scenarios for teacher education futures	Sandra Schuck & Peter Aubusson	2010		TE & ICT	Descriptive	Multi-dimensional
43	Three educational scenarios for the future: Lessons from the sociology of knowledge	Michael Young & Johan Muller	2010		Education & knowledge	Normative	One-dimensional
44	Teaching 2030	Barnett Berry	2011	MetLife Foundation	Teacher roles & identity	Descriptive	Multi-dimensional
45	The future of teacher collaboration networks in 2025	Romina Cachia	2011	Tellnet (Teachers LLL Network) (EUN/ IPTS)	Teachers & networks	Descriptive	One-dimensional
46	Scenarios for the future of the teaching profession	Marco Snoek et al	2011		Teachers & society	Descriptive	Two-dimensional
47	The future of schooling. Educating America in 2020	Laura Lefkowitz & Vicki Urquhart (Ed.)	2011	McREL	Education & society	Descriptive	Two-dimensional
48	Learning scenarios		2011	Business Educa 2011	Education, ICT, & work	Descriptive	Two-dimensional