Scenario planning and learning technologies
The foundation of lifelong learning

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Abstract. In this paper, the author reports findings from research concerning the planning of learning scenarios in education. The purpose of the research is to explore the value of this scenario planning and reflection-on-action. In particular, the research objective is to explore how this innovative method can guide the adoption of ICT in education and cultivate competencies for lifelong and lifewide learning.

1. Introduction

Lifelong and lifewide learning can be considered a guiding principle for provision and participation across the full continuum of learning contexts. The implementation of this vision into formal education is currently a challenge. A crucial component is the pedagogical approaches of teachers – from preschool to university and adult education. This paper deals with research concerning a complex of problems related to the foundation of this challenge: the planning of learning events. The main question is: How to design innovative learning scenarios that fosters lifewide and lifelong learning?

1.1 Why learning scenarios?

Proponents of scenario planning make it clear that scenarios are not predictions of the future [1]. Rather, they aim to perceive futures in the present and foster innovation. The results may lead to better thinking and reflection on current trends and developments and an ongoing strategic conversation about the future [2].

During the past few decades, scenario planning has emerged in various fields and for various purposes. Scenarios represent a natural bridge between mind and world. The notion of scenario itself can be defined as a brief narrative that describe possible futures and find paths towards realization, based on plausible hypotheses and assumptions grounded in the present [1].

Scenario thinking has become a kind of literacy. At an early age, everybody has to be able to make up scenarios, whose potentials, problems, and pace of work can then be considered and appreciated [1]. It implies the use of meta-cognitive skills and is an underlying part of lifelong and lifewide learning [3].

What matters is reflective thinking about learning for practical improvement. Thinking reflectively requires the subject of a thought process to become its object. For example, having applied themselves to mastering a particular mental technique, reflection-on-action allows individuals to then think about this technique, assimilate it, relate it to other aspects of their experiences, and to change or adapt it. Individuals who are reflective also follow up such thought processes with practice or action [3].

Progress is often based on increased simplicity. Consequently, the scenarios may be relatively simple. Moreover, they do not have to be new in an objective sense of the word. According to a theory of innovation, what matters is the perceived newness [4]. If some teachers, for example, perceive a learning scenario to be new and manage to realize it because it is not too complex, then their practice can be considered innovative even if some of their colleagues adopted the same approach last year or before.

The scenarios may address specific factors that maintain difficulties for the learners [5]. In this manner, scenario planning is a way to address current barriers to lifelong and lifewide learning and professional development.

2. Reflection-on-action

Scenario planning promotes reflective competencies and facilitates conversation about what is going on and what might occur in future education [6]. It is about re-perceiving the learning environment and promoting differentiated, flexible, proactive stances toward the pedagogical practice of the future. In particular, it is designed to identify and focus on important 'what if'-questions, which provide fresh ideas that challenge practice which relies on habits more than on evidence [7].

This approach is different from that traditionally employed, which involves general models of 'best practice'. Rather than attempting to apply general models to practical situations, the aim is to make better decisions about what to do or avoid doing.

The teachers' planning process may rely on their conscious thinking and modification while on the job. This reflection-in-action typically includes iterative loops running though: observation, reflection, decision, and acting. On ordinary days, however, the four activities may not accurately reflect standard practice, because teachers may lack opportunity and time. Their workload often works against regular and systematic reflection-in-action.

Some teachers may also consider reflection-in-action an academic pursuit, i.e., not associate it with working as a teacher at all (Hatton and Smith, 1994). Therefore, reflection-in-action may be extraordinary, but not rare.

In-service education and innovative projects and initiatives, on the other hand, often promote reflection [9] [10]. At such events, the teachers frequently reflect on

their practice, thinking back on what they have done and how their knowledge may have contributed to the outcome.

In addition, the teaching, supervision, and mentoring provided at these events often inspire the participant's considerations regarding recognized and unrecognized conflicts between institutional ideals and workplace practice. Teachers may, for instance, reflect on future practice, thinking ahead without a direct connection to present action [8].

To begin with, the teachers may articulate and clarify their beliefs and experiences. This preliminary articulation then provides a useful basis for reflection on arrangement of environments where the learners can interact, learn, and learn to learn [11].

Thereafter, the teachers may give voice to their ideas and write their scenarios down. Hereby, they can frame the often complex situations and ambiguous problems they are facing, analyze possible approaches, and plan to modify their actions as a result [12]. In short, the single loop of planning is extended to a double loop that will allow the teachers to 'stop-and-think' [8] and lead to genuine reflection and innovation (fig. 1).
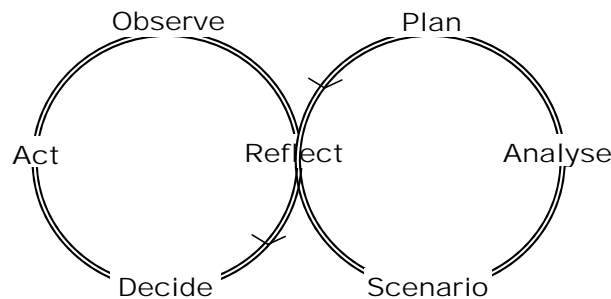

Fig. 1. Scenario planning

3. Learning modalities of the information society

In the knowledge society, the learning environment is changing since both the learners and teachers make frequent use of the intranet and mobile and stationary digital devices. Consequently, a purpose of scenario planning is to deploy and actually use ICT to support learning. In particular, it deals with the frequent use of this technology in educational settings including access to after-hours ICT facilities.

The scenarios developed by the teachers are decisive, since a crucial component is the teachers' pedagogical approaches [13]. In essence, education is communication, and the teachers may focus on innovative ways of communication to foster the changes called learning. Their longer-term planning may also address fundamental questions like: "Is ICT changing education and what might schools become?" [14]?

The shorter-term planning may consider the 'symbiotic' relationship between learning and ICT, reflecting the way in which learners actually make use of the technology. In particular, teachers may consider future communication and arrangement of environments. Their planning may thereby reflect questions like: "Under which circumstances do the learners make use of ICT and does it make a difference?"

Together, a group of teachers may design visionary scenarios concerning when and how to communicate in or out of schools by means of ICT. The process may be initiated through a joint discussion of the curriculum objectives and the potential role of digital technology in fulfilling the desired learning outcomes in a collegial model of scenario planning. It may then be followed by collaborative scenario planning exploring the possible implementation of ICT and all the issues that may need to be taken into account [15].

During this process, the collegial team may draw on the different types of knowledge and skills of each member of the team in order for all to be able to develop professionally through the mutual interaction [15]. The notions of 'apprentice' and 'master' may represent teachers with relatively little ICT-experience and teachers, knowing how to use ICT effectively to teach their subject and to support their wider professional role. By engaging in scenario thinking both 'apprentice' and 'master' can, almost as a by-product, develop greater levels of confidence and apply ICT more effectively than before.

4. Case studies on scenario planning

4.1. Impact of reflection-on action - preschool teachers

The impact of scenario building can be examined by researching innovative development projects. This section contains results from at study regarding a Danish municipality, which allocates time to these processes [16]. According to a vision of the local authority of Vordingborg, reflection-on-action constitutes an important element in lifelong learning. Since lifelong learning has become the guiding principle for provision and participation across the full continuum of learning contexts, the staffs of educational institutions have got time to practice what they teach.

Consequently, the local authority has allocated 25 pct. of the planning time to reflection-of-action. This includes the staffs of all educational institutions (0-16 years). My research, currently in progress, investigates the reception among the staff of two kinds of day nurseries (0-3 and 3-6 years) and primary and secondary schools (grade 0-10).

Findings from the first case study indicate that the staffs are very much in line with the local authority [16]. The staffs emphasize that that the initiative develops their community of practice. In particular, they get time:

- To study their educational practice in depth;
- To develop mutual understanding;

- To inspire each other;
- To experience individual strengths and potentials;
- To increase consciousness of pedagogical practice;
- To get access to models to develop this practice;
- To be innovative and creative together;
- To combine theory and practice;
- To be updated;
- To develop common visions;
- To develop their pedagogical practice;
- To develop relationships between children and adults;
- To debate and develop the curriculum;
- To foster collaboration and team based learning;
- To read together;
- To develop common notions and language;
- To consider notions like learning and learning environment;
- To create;
- To document;
- To learn from each other at the institutions;
- To foster cooperation between institutions;
- To foster cooperation in the municipality.

In particular, the reflection-on-action is aimed at scenario planning that strengthen the relationships between the children and the staffs or foster learning from various activities. The research findings document that the time allocated to reflection-on-action represents an important first step towards learning communities of practice and lifelong and lifewide learning. Almost all the participants declared that they greatly appreciated the following activities:

- Rewarding reflection-on-action together with their colleagues
- Substantial contribution to the description of innovative learning scenarios
- Intense dialogue concerning these innovate scenarios.

4.2. Impact of scenario writing - teachers in primary and secondary education

The impact of scenario building can also be observed by researching courses for teachers, in which it is considered a key activity. What matters is not whether the courses studied are aimed at a certain degree or are short-term courses (non-award bearing), but that they give priority to reflection-on-action. The following paragraphs present results from at study regarding the Danish ICT Driving License in which scenario planning is considered the main collaborative activity.

The objective of these in-service courses for teachers is to foster the application of ICT into the classrooms by means of scenario planning. Eight different courses has been developed and offered to teachers of schools (grades 0-12) and teacher education institutions. During each course, which last 4-9 months, the participants typically produce multi-faceted scenarios specifying the objectives, expected learning outcomes and products, and main roles of teachers and learners at various stages.

Narratives about imagined goal-oriented sequences of learning activities often address some or all of these topics:

1. Clarification and articulation of learner learning outcomes (construction, rather than reproduction of knowledge; value beyond school);
2. Brief description of content (topics, concepts, and working methods)
3. Main roles of teachers and learners (who does what?)
4. Overview of organization (duration; subject or cross-curricular; plenum and/or small group work; support of learners with special needs);
5. Methods of evaluation (continuously and summarizing);
6. Take-off activities (learners' previous experiences and qualifications; method of introduction);
7. Learner productions.

So far, three out of four Danish teachers at grade 1-10 have been engaged in the scenario-based collaborative e-learning event. The scenarios produced by the teachers encompass a broad spectrum of learning activities concerning:

- Collaborative learning with digital portfolios and learner logs;
- Knowledge processing activities with creative writing;
- Information retrieval as part of self-directed learning;
- Real (not 'as if') communication aimed at various target groups and with various layouts and graphical designs;
- Compensational use of digital technology.

Even though some teams of teachers have not been through this kind of process before, they benefit from writing down their scenarios. Participants with a nodding acquaintance with the use of the digital technology in education may prefer using headwords or bullets. They benefit, however, more from using their pedagogical imagination in scenario telling. The proses, among other things, allow them to give the grounds for their choices between various pedagogical approaches.

To be approved, each scenario must describe a well grounded and innovative application of ICT into the schools. Every team of teachers has to present their exact arguments. Consequently, the provision of feedback is tailored to the reflections and scenario planning of each team.

The first real course based on a scenario-model was tested and evaluated in 1999/2000 with 7.000 teachers. 88% of these participants considered the course content to be highly relevant and 90% appreciated the teamwork in this period [17]. It helped them focus their learning and increased the quality of their scenario planning. A later study [18] provided similar results, and the research findings are considered evident, since they are generally documented over a longer period.

Another later study addressed the question of the value of the scenario planning in the long run. Data was collected one year after the completion of the course. In particular, the further study addressed the crucial question: "Did the teachers consider the scenario planning useful afterwards?" The participants, who completed the course, reported a positive impact. For example, 86% acknowledged that the course was useful in promoting the use of the Internet in their classes [18]. The participants reported that they are planning scenarios with learners making use of the internet more often than before. In addition, they acknowledged that the course had high impact on their own use of E-mail and Learning Management Systems, the Internet, and word processing (fig. 2).
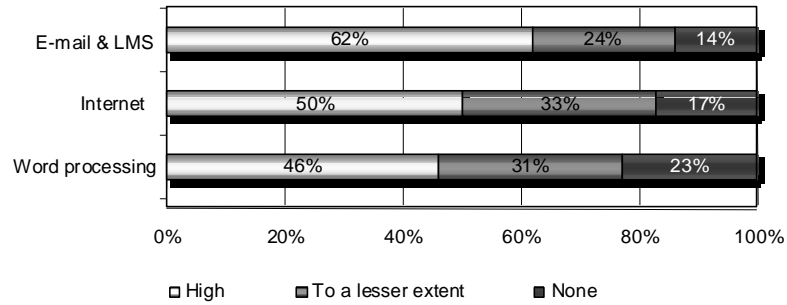
Fig. 2. Impact on teaching

6. Conclusion

In the first part of the paper, the author argues that learning scenarios may be a generic technique to stimulate thinking about innovative teaching and learning events. The scenarios produced at these occasions may aim to perceive innovative practice in the present practice. Teachers – from preschool to university – may promote a capacity to plan learning scenarios, and to choose among potential candidate scenarios while on the job (reflecting-in-action).

Moreover, in-service education, and international, national or local developments, projects and initiatives may foster reflecting-on-action. Supervision and mentoring provided at these events may also support the teacher's scenario planning.

In the last part of the paper, the author reports positive research findings regarding such events. They support the teachers imagining the steps taken by the learners with various objectives and paces. In conclusion, the scenario planning is a useful tool for teachers who adopt digital technology and new learning standards in education.

Acknowledgements

References

1. Lankshear, C. & Knobel, M. (2006). New literacies. Everyday practices and classroom learning. Second edition. Berkshire: Open University Press. McGraw-Hill Education.

2. Snoek, M. (2003). The Use and Methodology of Scenario Making. European Journal of Teacher Education, Vol. 26, No. 1.
3. OECD (2006). The definition and selection of key competencies. Executive Summary. (DeSeCo project). Available from: www.oecd.org/dataoecd/47/61/35070367.pdf
4. Rogers, E. M. (2003). Diffusion of Innovations. Fifth Edition. New York: Free Press.
5. Nordahl, T. (2005). *Læringsmiljø og pedagogisk analyse. En beskrivelse og evaluering av LP-modellen*. Rapport 19/05. Oslo: NOVA.
6. Cautreels, P. (2003). A Personal Reflection on Scenario Writing as a Powerful Tool to Become a More Professional Teacher Teacher. European Journal of Teacher Education, Vol. 13, No. 2.
7. Berger, P. L. & Luckmann, T. (1966). The social construction of reality. New York: Doubleday.
8. Schön, D. A. (1983). The reflective practitioner. How professionals think in action. New York: Basic Books.
9. Hansen, O. (2000). SocraTESS ODL Network. Final Report. Hinnerup: Pædagogisk, Psykologisk Rådgivning.
10. Scrimshaw, P. (2004). Enabling teachers to make successful use of ICT. London: BECTA.
11. Dewey, J. (1916). Democracy and Education. New York. Macmillan.
12. Hatton, N. & Smith, D. (2006). Reflection in teacher education: Towards definition and implementation. Sydney: The University of Sydney: School of Teaching and Curriculum Studies.
13. Cox, M. et al. (2003). ICT and pedagogy. A review of the research literature. London: DfES.
14. Abbott, C. (2001). ICT – changing Education. London: RoutledgeFalmer.
15. Mutton , T. et al. (2006). Mentor skills in a new context: working with trainee teachers to develop the use of information and communications technology in their subject teaching. Technology, Pedagogy and Education. Vol. 15, No. 3.
16. Andresen, B. B. (2007). Mangfoldighed og pædagogisk forandringsledelse – et 2½-årigt udviklingsprojekt i Vordingborg Kommune. Første delrapport. Vordingborg: Fagsekretariat for Pædagogik.
17. Andresen, B. B. (2000). Det første år med det pædagogiske IT-kørekort. Århus: UNI-C. Available from:
18. Styregruppen for Skole-IT (2002). Effektundersøgelse 2 af Skole-IT. København: Rambøll Management.