Methods Futures Briefing #007

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Research, Education and Futures Literacy

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This Methods Futures Briefing focuses on changes in education and the role of Futures Literacy in innovative learning approaches. It describes how social processes of teaching and learning have been transformed by technologies, interconnectivity and generational change. Demographic transformations, specifically, will imply ongoing consideration of the diverse learning needs of different groups in terms of age, life trajectories and global cultural backgrounds and a re-design of higher education institutions. Such changes suggest that a shift in the knowledge paradigm is needed to cope with new demands and expectations in creating, accessing and implementing knowledge and the briefing outlines implications for social science and educational research approaches.

Anticipating futures in education

Futures Literacy can be understood as the capacity to understand complexity in social and ecological environments (Poli, 2021). It is expected to increase learners' adaptability to upcoming challenges and provide them a creative framework for anticipating social change and analysing and debating their expectations about and for society.

The social sciences have long debated how education influences individuals and shapes collective institutions. A mixed presence of traditional and innovative pedagogical practices still dominate the European panorama, and the pressure to innovate in educational systems is also rising with the growing interference of technology and changing societal needs, as well as the impact of internationalisation of research management and knowledge (OECD, 2025).

Researchers working on innovation programs for teaching and learning highlight push factors including **new educational technologies** (Cachia et al., 2010) and the impulses of private and social **enterprise** and **government** agencies to develop **collaborative working environments** (Sutton and De Sanctis, 2017). Demographic change across almost all Western countries, in particular, imply that **lifelong learning** should become an effective goal for all, and a viable and democratic way to cope with technological change (UNESCO, 2022; Bleikie et al, 2017), and therefore understand the future.

Knowledge creation and social participation

Innovative approaches to learning and teaching challenge the traditional process of knowledge creation. They require a paradigmatic change in assessing learning results and expressing judgements on individual and group performance (Hughes, 2023). Teachers, for example, will need to assess learning results from a formative approach by means of multiple evaluation tools, that may include qualitative as well as quantitative indicators. Moreover, teaching innovations require universities to establish collaborative networks and create synergies across disciplines (Brinia and Davim, 2020), to share and monitor experiences and develop tools for international teaching programs (Jongbloed, 2023). This means that research may increase in complexity,

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asking for novel (combinations of) methods and methodologies (Visvizi et al., 2019).

Constructivist and Transformative pedagogical theories conceive education as an opportunity to shape human aspirations which has a high potential to generate significant individual and societal transformations (Mezirow, 1991). While implementing innovative practices, teachers can improve cohesiveness, as well as enact organizational change and social innovation in communities and in public-private relationships (Lawler and Sillitoe, 2013). Teachers involved in innovative learning programs have thus been described in a recent survey as part researcher and part 'social influencer', summing up the contemporary skills that are needed to activate networks of collaborative learning between learners and their communities (ASHOKA, 2022). Methodologically, researchers will therefore need to be attuned to the changing roles and skills of professional teaching.

Beyond that, innovation in learning and teaching practices carries with it implications for researchers' work and their role in society, and solicits inquiries about the role of sciences, the dialogue across disciplines and their 'modus operandi' in creation and dissemination of knowledge across generations. Specifically, active learning can be stimulated by application of a **complexity approach** to improve 'the capacity to understand and access global knowledge systems; the awareness of multi-perspectival orientations to self and culture, based upon an understanding of diverse human experiences; as well as the ability to construct new ideas' (Olssen, 2011: 387).

Learning to analyse complexity and design shared alternative futures has also the effect of problematizing decision making and socialising the public to be responsible towards future generations (Miller, 2011). Futures literacy, in this sense constitutes a mind-set prerequisite for **developing foresight about prospective risks and opportunities** of complex scenario evolution such as societal adaptability to climate change and green transition (De Vito, 2024). Innovative learning environments, specifically, tend to be adaptive and to focus on interactive relationships between the teacher, the learners and the knowledge contents, as in the case of gamification and flipped classroom models. Such engagement of teachers into continuous learning processes and coaching implies also that social research and in particular ethnographic and evaluative methods need to be pivoted into professional development programs for teachers.

Researchers' alliance with 'futures aware' citizens and social institutions poses the base for an **integration of science into society** that exceeds its traditional normative function and emphasises the multiplexity of human knowledge. Innovative learning programs proved particularly effective in STEM (Lewis and Stoyanovich, 2022) and in association with artistic disciplines, to provide students a better understanding of how science and technology progresses (Jeskova et al., 2022). The Spidas project, for example, analysed the impact of Project Based Learning to provide teachers more confidence in data management and IT and improving students' interest for statistical disciplines and skills needed for careers in data analytics (Kazak, et al. 2019). In the area of social sciences, collaborative teaching can originate new curricula and engage students in a process of reflection about the social relevance of their learning (Cordner, Kein and Baiocchi, 2012). It can also stimulate action-research programs that integrate pedagogical and sociological methods to provide both students and teachers with an improved understanding of their interactions in the educational settings and reflexive feedback on effectiveness of teaching.

Future scenarios for education

Public debate on the future of education, precipitated by COVID19, has questioned the role that digital technologies could have on individuals and the collective. On one side, **inclusivity** and **access** to knowledge are favoured by global interconnectivity and access to online contents and learning platforms. On the other hand, the **benefits of these innovations are still reduced** for segments of society already disadvantaged (Eynon and Malberg, 2021) and **worries about increasing technological complexity** in using digital technologies and AI have risen among large sectors of the population (Eurobarometer, 2023; Anderson and Rainie, 2023). Thus, futures literacy will not be a uniform skill and researchers would need to be sensitive to different capacities.

Knowledge in the coming years will be more accessible but also more cognitively and emotionally

complex. The **cognitive relationship** between users (both individuals and organisations) and technology is expected to continue changing with the integration of AI into daily life, government and the economy (OECD, 2025). Prioritizing relevant data, fact-checking and most of the search and selection processes will be automated, prospectively changing the role of researchers and their influence on logical setting and methodological decision-making. Social sciences, in particular, due to their higher dependence on contextual knowledge, bear the risk of being either outnumbered by computational applications or circumscribed to research applications that contribute scantily to building public policies.

Therefore, educational research will have to set new standards and thresholds in teaching paths across disciplines, as well as enquire about conditions of incidental learning. **Integration of information** sources may become easier and so teachers and learners will need to become skilled evaluators of synthesised knowledge. Optimistic scenarios imagine that the educational process will involve all the ages/phases of life and will be organized as an open dynamic process of creative content creation, supported by peer collaboration and virtual guidance by mentors/teachers. The learning relationship will also be deeply modified by the progressive integration of automated evaluation and online training programs and, increasingly, by the side-effects of the implementation of AI in many elements of the educational systems (Tuomi et al., 2023). Teachers' might thus evolve into 'learning facilitators' who are coping with both collective psychological diagnostics and media communication skills, and methodological choices would need to take these into account. Educational research, specifically, will need to explore and codify the 'triple role' of teachers: as mentors to direct the students' learning path in the most appropriate way, as facilitators to enhance the capabilities of each student and finally, as researchers to produce reflexive knowledge about these educational and cognitive processes (Gomez-Ejerique and Lopez-Cantos, 2019).

Methods and Futures Literacy

An alliance between pedagogical innovation and futures studies has risen in the last decade, mentoring initiatives and programs to build up anticipatory capability or Futures Literacy (Poli, 2021). These Innovative learning programs educate students and youth to see the future as "an instrument of emancipation" (Appaduraj, 2013) and develop a sense of agency. Ultimately, this implies **a future conjunction of education efforts with research methods**.

In terms of social science methods, researching with participants who have greater futures literacy may result in **greater engagement in debate** on how futures impact the present, potentially more nuanced and codified forms of engagement. There may be increases and changes in the discourse surrounding the futures and societal anticipation warranting attention to detail in the design of questions, probes and strategies in a range of methods. To develop anticipatory capabilities, one must build confidence in one's capabilities to learn, relate with knowledge, and ultimately to deal with social aspects of learning, such as cooperation and negotiation of meaning and practices. Collective benefits of the futures literacy approach, foster its application in the design of national educational programs (Finland, Taiwan) as well as in educational projects (e.g. for the humanities (Holtorf, 2020; and for science and technology Chan and Erduran, 2024), and in faculty training programs (Virdergor, 2018; Kazemier et al. 2021).

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