Dis/Entangling the Worlds of Education through a STS Perspective

Assunta Viteritti
Sapienza University of Rome

Leonardo Piromalli
Sapienza University of Rome

Abstract: All fields of education are affected by technological and digital processes. Blackboards (physical and digital), information infrastructures, chairs (mobile and immobile), online platforms, educational data, they are all weaving together with humans the very fabric of educational and research processes and practice in school, university, and training settings. These entangled processes are shaping educational scenarios through heterogeneous practices. In this short contribution, we shall unpack such processes and explore the emergence of relational textures across educational scenarios.

Keywords: sociomateriality; digitalisation; education; learning; knowledge.

Corresponding author: Leonardo Piromalli, Sapienza University of Rome, Department of Communication and Social Research, Via Salaria 113, Rome, Italy. Email: leonardo.piromalli@uniroma1.it

Introduction

When we received the announcement of the upcoming VIII STS Conference, we decided to convene a panel session on how to perform STS-oriented research in the field of education ("Education and/as its making: Vulnerabilities in the sociomaterial worlds of learning"). The educational field is in fact dense now with relational processes that entangle humans and non-humans and produce significant effects that deserve scholarly investigation.

In this contribution, we shall offer an overview of the contributions brought by the participants to the panel session and provide a summary of the emerging STS perspective in education and its contribution to educational studies. Two issues will be investigated: how sociomaterial processes are (re)shaping education, and how digitalisation and platformisation processes are reassembling educational policy and practice.

TECNOSCIENZA
Italian Journal of Science and Technology Studies
12 (2) pp. 107-113 - ISSN 2038-3460
www.tecnoscienza.net

T/S TECNOSCIENZA
Italian Journal of Science & Technology Studies

1. Sociomateriality, Technological Frames, and the (Re)Shaping of Education

The STS approach was translated in the field of education in the first decade of the 21st century with the introduction of the concept of sociomateriality. This notion was originally put forward by Wanda Orlikowski (2007) for describing the constitutive entanglement of social and material processes in everyday organisational life. Soon after, the German sociologist Estrid Sørensen brought about this concept in educational studies for exploring how both humans and non-humans are implicated in relational arrangements in educational scenarios, and what are the effects of this enmeshment (Sørensen 2007; Sørensen 2009; Fenwick et al. 2012; Fenwick 2015). As Mathias Decuypere recently argued (2019), the STS approach in education enables to observe simultaneously the 'doing', the 'un-doing', the 're-doing', and the 'non-doing' of educational actors within and across their intimate relationships. Artefacts and materiality – such as technology, space, body, policy, practice – have thus taken centre stage in scholarly investigation into the (re)shaping of local and global educational processes (Sørensen 2009; Fenwick and Landri 2012; Landri 2018). The sociomaterial sensitivity in education is often adopted for exploring the emergent effects of the assemblage of human and non-human actors in educational scenarios, and the design and translation of educational policy (Fenwick and Landri 2012). A wide range of research opportunities thus unfolds for investigating educational processes through a sociomaterial approach.

For instance, the everyday professional and epistemic practices (Knorr-Cetina, 1999) of university professors are nowadays attached to (Latour 1990; 2011) and entangled with (Barad 2007) complex and non-neutral sociomaterial networks. The life of university professors has become a daily Odyssey, as they are constantly caught in the multiple effects of new organisational and administrative practices that extend beyond the consolidated teaching and research activities. In order to comply with the 'moral frame' imposed by new public management logics, university professors must continuously account for their work and attend to many administrative requests that emerge from the marketisation of academic institutions: they must produce efficient performance in the professional academic market; they must update their personal performance indicators on their institution's digital platforms; they must self-monitor their rankings, positioning and citational indexes; they must meet specific performance standards if they wish to qualify for funding opportunities. The agency of university professors thus allies with new ecologies of elements, and produces unexpected attachments to these sociomaterial networks. New sociomaterial textures emerge thereby (Orlikowski 2007; Fenwick 2015) which diverge from conventional university practice.

A sociomaterial perspective is also adopted for exploring technological

artefacts as relational arrangements that are inscribed with specific – and sometimes conflicting – moral values (Bowker and Star 1999) and programmes of action (Akrich and Latour 1992). As argued by STS scholars, educational artefacts are better understood as 'matters of concern' rather than 'matters of fact' (Latour 2004). Michael Schlauch (Free University of Bozen-Bolzano, Italy) drew on these insights to discuss the effects of sociomaterial entanglement between human actors and texts in educational scenarios. In particular, he combined the sociomaterial sensitivity and the 'interpretive flexibility' approach (Bijker 1997) for discussing how educational texts have configured processes and practice in education through history. By following a methodological path "that leads from text to things and from things to texts" (Latour 1992), Michael Schlauch distinguished three competing technological frames ('teacher-centred', 'technology-centred', and 'distributed') that afford different kinds of spatial arrangements and interactions. While providing the technological frame for most educational texts, the 'teacher-centred' and 'technology-centred models' contribute in (re)producing vulnerable interactions in classrooms. Instead, the 'distributed instruction' frame involves instances of 'repurposing', 'reinscripting' and 'repairing' (Jarzabkowski and Pinch 2013) that expand the affordances of the artefacts beyond the prescribed programme. Sociomaterial flexibility in educational technology should therefore be further explored and fostered.

2. Platforms, Digital Technologies, and New Assemblages Across Educational Policy and Practice

The concept of 'assemblage' is also very significant today in STS studies on education. The strength of this notion resides in the fact that it enables to describe both the emergence of events and objects in social and material spaces, and their entanglement in heterogeneous relational networks.

This concept is often mobilised to inspect educational policies as ever-changing entanglements that are seldom coherent and complete (technology and software companies, educational practices, subjects, texts, programmes, tasks, exercises, teachers, students, etc.). 'Assemblage thinking' is also useful for unravelling the 'power networks' (Williamson 2019) that tie together edtech market actors (such as Google, Apple, Microsoft, etc.) and institutional actors (schools, universities, etc.). Moreover, this concept is deployed to analyse digitalisation processes in education (Gorur 2011; Landri 2018), as it allows to untangle the hybrid relational networks that bring together configurations of actors and technical processes striving for the digitalisation of educational spaces and practices. This has been discussed in educational studies on computer-mediated instruction (CMI) in university settings (Nespor 2012), and on digital applications and technological ecologies of learning (Decuypere 2019). Digitalisation processes have also been addressed in scholarly research on the design and use of

learning platforms, which might emerge as invisible architectures that build networks of action and reassemble educational processes (Williamson 2018). More broadly, digitalisation processes in education have been often addressed in recent literature as the effect of complex sociomaterial relational assemblages (Landri 2018; Decuypere et al. 2021).

An interest to assemblages, platforms, and digital technologies has indeed emerged in our session. Some contributions have embraced this sensitivity in order to explore the making and the effects of infrastructuring and platformisation processes on academic professionals, IT specialists, and students in order to highlight sociotechnical features of interoperability and inspected standardisation and marketisation processes. Mariacristina Sciannamblo (Sapienza University of Rome) discussed how digitalisation processes in academic life and other knowledge production processes might contribute both in creating new spaces for action, and in (re)producing older vulnerabilities and new fractures.

Research on digitalisation processes in education have singled out a particular tension in empirical settings (van Dijck et al. 2019): on the one hand, edtech actors might attempt at imposing top-down digitalisation and platformisation policy and practice; on the other hand, interdisciplinary professional communities can build from-below digitalisation and platformisation processes.

Final remarks

The notions of sociomateriality and assemblages in education have become significant lens for examining phenomena and processes – artefacts, technical devices, platforms, spaces, policy, practice, etc. – that emerge today in the educational field. This sensitivity allows for 'thicker' explorations on the active role played by all forms of materiality – both digital and analogue – in the making of contemporary education. In particular, a posthumanist and sociomaterial perspective can be fruitfully adopted to investigate the heterogeneous entanglement processes across which education is negotiated and fabricated (Latour 1992; Braidotti 2019).

The scenario of contemporary global education is marked by tensions, complexities, and fractures. Technology in education can indeed foster the (re)production of existing vulnerabilities and inequities, since it might inscribe new normativities (through discourses, policies, regulations, behaviours, algorithms, etc.) and foster marketisation processes in education (Williamson 2019). However, technology can also mend troubled social worlds that are challenged by educational crises at both at the local and global scales. Alternative cultures, spaces, and connections can thus be envisioned and enacted.

As argued by scholars, the COVID-19 pandemic has prompted a significant 'acceleration' in educational processes worldwide (Cone et al. 2021; Grek and Landri 2021). It becomes paramount now to inspect all processes

that might be (re)shaping the educational field, dis/entangle all social and technical processes, and invent new postures and lexicons that can help dispel technological determinisms. A STS sensitivity to educational processes is a valuable tool in this endeavour. The challenge for STS scholars in education is indeed to unravel the hidden cultures inscribed in technologies, co-produce reflexivity and expertise through engagement with research partners, and interfere in the empirical field itself.

The issue at stake is to start examining educational practice and policy as a heterogeneous set of relational processes. A renewed recognition of the inherent sociomateriality, uncertainty, and nonlinearity of educational processes might then help to imagine and perform alternative worlds.

References

Akrich, M. and Latour, B. (1992) *A Summary of a Convenient Vocabulary for the Semiotics of Human and Nonhuman Assemblies*, in W.E. Bijker and J. Law (eds.) *Shaping Technology/Building Society: Studies in Sociotechnical Change*, Cambridge, MIT Press, pp. 259-264.

Barad, K. (2007) *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*, Durham, Duke University Press.

Bijker, W.E. (1997) *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*, Cambridge, MIT Press.

Bowker, G.C. and Star, S.L. (1999) *Sorting Things Out: Classification and Its Consequences*, Cambridge, MIT Press.

Braidotti, R. (2019) *Posthuman Knowledge*, Cambridge, Polity Press.

Cone, L., Brøgger, K., Berghmans, M., Decuypere, M., Förschler, A., Grimaldi, E., Landri, P. (2021) *Pandemic Acceleration: Covid-19 and the emergency digitalization of European education*, in "European Educational Research Journal".

Decuypere, M. (2019) *STS in/as education: where do we stand and what is there (still) to gain? Some outlines for a future research agenda*, in "Discourse: Studies in the Cultural Politics of Education", 40 (1), pp. 136-145.

Decuypere, M., Grimaldi, E. and Landri, P. (2021) *Introduction: Critical studies of digital education platforms*, in "Critical Studies in Education", 62 (1), pp. 1-16.

Fenwick, T. (2015) *Sociomateriality and Learning: A Critical Approach*, in D. Scott and E. Hargreaves (eds.), *The SAGE Handbook of Learning*, London, Sage, pp. 83-93.

Fenwick, T. and Landri, P. (2012) *Materialities, textures and pedagogies: Socio-material assemblages in education*, in "Pedagogy, Culture & Society", 20 (1), pp. 1-7.

Fenwick, T., Nerland, M. and Jensen, K. (2012) *Sociomaterial approaches to conceptualising professional learning and practice*, in "Journal of education and work", 25 (1), pp. 1-13.

Gorur, R. (2011) *Policy as Assemblage*, in "European Educational Research Journal", 10 (4), pp. 611-622.

Grek, S. and Landri, P. (2021) *Editorial: Education in Europe and the COVID-19 Pandemic*, in "European Educational Research Journal", 20 (4), pp. 393-402.

Jarzabkowski, P. and Pinch, T. (2013) *Sociomateriality is 'the New Black': Accomplishing repurposing, reinscripting and repairing in context*, in "M@N@Gement", 16 (5), pp. 579-592.

Knorr-Cetina, K.D. (1999) *Epistemic Cultures: How the Sciences Make Knowledge*, Cambridge, Harvard University Press.

Landri, P. (2018) *Digital Governance of Education: Technology, Standards and Europeanization of Education*, London-Oxford, Bloomsbury.

Latour, B. (1990) *Technology is society made durable*, in "The Sociological Review", 38 (1), pp. 103-131.

Latour, B. (1992) *Where are the missing masses? The sociology of a few mundane artifacts*, in W.E. Bijker and J. Law (eds.) *Shaping Technology/Building Society: Studies in Sociotechnical Change*, Cambridge, MIT Press, pp. 225–258.

Latour, B. (2004) *Why has critique run out of steam? From matters of fact to matters of concern*, in "Critical Inquiry", 30 (2), pp. 225-248.

Latour, B. (2011) *Love your monsters*, in "Breakthrough Journal", 2 (11), pp. 21-28.

Nespor, J. (2012) *Technology and the Politics of Instruction*, Mahwah, Routledge.

Orlikowski, W. J. (2007) *Sociomaterial practices: Exploring technology at work*, in "Organization Studies", 28 (9), pp. 1435-1448.

Selwyn, N. (2014) *Digital technology and the contemporary university: Degrees of digitization*, London, Routledge.

Sørensen, E. (2007) *STS goes to school: Spatial imaginaries of technology, knowledge and presence*, in "Outlines. Critical Practice Studies", 9 (2), pp. 15-27.

Sørensen, E. (2009) *The Materiality of Learning: Technology and Knowledge in Educational Practice*, Cambridge, Cambridge University Press.

van Dijck, J., Poell, T. and De Waal, M. (2018) *The Platform Society: Public Values in a Connective World*. New York, Oxford University Press.

Williamson, B. (2018) *The Hidden Architecture of Higher Education: Building a Big Data Infrastructure for the 'Smarter University'*, in "International Journal of Educational Technology in Higher Education", 15 (12).

Williamson, B. (2019) *New power networks in educational technology, in "Learning, Media and Technology"*, 44 (4), pp. 395-398.