Learning in Transformation

Isa Jahnke and Johannes Wildt

Definition

The noun *transformation* was first mentioned as verb *to transform* in the mid-14th century and means "change the form of" (transitive), from Old French transformer (14th century), from Latin *transformare* "change in shape, metamorphose", from trans "across, beyond" and *formare* "to form" that relates to the meaning of "undergoing a change of form" (Harper 2023).

Learning in transformation (in short: *transformative learning*) appears as a novel form of teaching and learning in higher education that is transdisciplinary and provides conditions and opportunities for investigating and shaping learning through the participation of the learners in *transformation* processes in work and society. From this viewpoint, learning is embedded in processes of societal transformation that are also situations in which meaning-making (learning) occurs. As such, the theory of meaningful learning (Howland et al. 2012), including digital technologies, seems appropriate.

The meaning of the term transformative learning is derived from scientific linguistic usage. For example, in natural science or technology, the term *transformer* (English) is used to describe an apparatus which converts kinetic energy into electrical energy. Here, transformation means change as a transition into a new form (of energy). In medicine, transformation refers to the conversion of a healthy cell into a malignant cancer cell. Transformation processes in the behavioral or social sciences are characterized by transitions of individual or social actors in which the actors change themselves in the transformations. For example, the invention of the printing press and the introduction of money led to behavioral changes in society.

In higher education, transformative learning is a learning process in which students use scientific knowledge to solve problems outside of school while working with people outside the university. While doing so, they use the scientific knowledge they learned in the context of higher education, then decontextualize that knowledge (from the setting in which they learned it) and recontextualize it (to apply and develop in the setting in which they are now working). This learning

experience is a process of transformation. In addition, transformative learning is not just a learning design approach. Instead, it becomes part of a transformation process itself; thus, learning itself becomes the object of transformation processes.

A difference between what is presented in this chapter and Mezirow's (1991) original understanding of transformative learning is that while Mezirow looks at the individual process of learning, *learning in transformation* is based, theoretically, on social learning. This approach views all forms of learning as social; learning only occurs if it is linked to a social dimension, such as a community or society in which learners experience themselves as participants, either physically or online. The synthesis of psychological and societal aspects makes *learning in transformation* an interdisciplinary task. As this task is oriented towards practical problem solving and, therefore, receives its scientific structure, it detaches itself from the disciplinary order and becomes the concept of *transdisciplinary learning*.

Background

The concept of *transformative learning* cannot be understood without understanding the historical roots of both (a) transformative learning by Mezirow (1991) and (b) transformation processes in societies. Both concepts were developed independently of one another. From a behavioral or social science perspective, the path to understand transformative learning leads back to Polanyi (1944). For Polanyi, the collapse of the global economic and social system at the end of World War II was followed by the *Great Transformation*, a complete reorganization of the global economic and social system.

After the collapse of the Soviet Union (and in later comparable upheavals in Latin America, Asia, and Africa), political and social scientists described the transformation of post-Soviet states into democratic societies with capitalist economic systems as societies in transition (Merritt 1980). To capture the specifics of this systemic change, Kollmorgen et al. (2015) distinguish transformation from other forms of social change. They recognize evolutionary adaptations of social systems and changes in their environment as forms of revolutions (which are usually disruptive but not necessarily violent), which refer to planned and controlled changes within social systems that serve the system's functionality. Transformations, however, involve fundamental changes in the systems themselves.

Currently, the understanding of the term *transformation* includes the view of socio-ecological transformation, such as the worldwide movement for sustainable development (UNESCO 2017). A widespread agreement is that such ambitious goals cannot be achieved without the participation of the actors involved or affected. Interaction of groups in socio-ecological transformation projects are needed (in education, politics, business, churches, civil society, and science). Higher edu-

cation is one relevant actor in this process of transformation, where teaching and learning must leave the wall of the ivory tower and enter professional and social practices ("transformative turn", Wildt 2022, 201–2). While science (and in this context research-based learning) is still at the center of all teaching and learning activities driving transformative learning, working on real-world problems creates opportunities that go beyond the possibilities of traditional learning (e.g. Rein and Wildt 2022). These opportunities lie in students learning through participation in planned collaboration with involved or affected groups of diverse actors in professional or societal practice.

Hence, transformative learning involves a shift in learning that goes beyond the traditional classroom setting, and involves engaging with real-world problems, perspectives, actions, and interests outside of the university. This type of change is facilitated by actors beyond the university who challenge students to move away from passive learning and instead immerse themselves in authentic experiences that foster deeper understanding and growth. In other words, transformative learning is an approach that takes students from dryland swimming and immerses them in the dynamic, multifaceted world of applied knowledge. This type of learning will encourage students to learn to decontextualize scientific knowledge acquired at academic institutions and then recontextualize it in outside fields.

Furthermore, transformative learning started in the field of adult education (Mezirow 1991). Until then, education had been predominantly directed toward the continuation of determined learning paths based on earlier phases of life. Instead, Mezirow paved the way toward lifelong learning that made room for deep shifts in career biographies and lifestyles. For higher education, this understanding of transformative learning is particularly relevant because it creates possibilities and opportunities for connecting conventional concepts of learning with newer concepts such as education through science. In an international comparison of 100 member universities of the European University Association, study programs were compared to show how the focus on transformative learning can be integrated into the development of study programs as a learning goal related to employability (professional relevance) and citizenship (social relevance). Recent reports (Jankowki 2022; Wagenaar 2022) show that these development tasks are also on the agenda today. However, this requires teaching and learning concepts that support a kind of student autonomy in the sense of a "shift from teaching to learning" (Barr and Tagg 1995). Meanwhile, in the United States, universities have agreed on standards for recognizing relevant achievements such as service learning also known as community-related learning (Jankowski 2022).

Finally, transformative learning has its roots in active, meaningful, and situated learning (Fry et al. 2003), which has been further developed by Howland et al. (2012). Active, meaningful learning is an umbrella term referring to a group of pedagogical strategies that the instructor applies to help students engage and

learn. Its premise is that learners do not learn because the instructor performs an activity, but learners learn through their own activity and reflections through facilitating the learner's interaction with the course material and with peers. Active learning contrasts traditional methods where students are rather passive, tending to listen, read, or watch something (e.g. lectures). Research has shown that active learning increases learning outcomes and improves learning performance, grades, and higher order competencies (Deslauriers et al. 2019; Freeman et al. 2014). Transformative learning is a type of active learning that takes places in a collaborative learning environment where practical contexts (situated learning) facilitate a community of practice (Lave and Wenger 1991).

Debate and criticism

The development of a transformative learning approach is still in its infancy. However, it can be argued that it is becoming apparent that the approach faces issues.

Epistemological issue: With the crossing of borders from university into practice, students run the risk of getting into normative conflicts between options for action and interests in truth, and disregarding the different logics between scientific and practical contexts. However, transformative learning has the potential to help people develop better solutions to problems, and thus keep people from holding onto inadequate solutions. In the long run, no one is served by (false) legitimation and, for students, the (possible) experience of a conflict between scientific truth and practical interests is a unique chance to reflect on epistemological differences between scientific theories and methods, or tensions between fundamental and applied research.

Self-regulation issue: Transformative learning raises questions about the extent of self-regulation of student groups. It does not reduce the responsibility of teaching or facilitating learning but requires new skills and competencies of teachers (e.g. coaching, supporting structures, providing feedback). Furthermore, transformative learning also reveals the *education paradox*: The learner needs autonomy for doing such projects, but regular courses with clear instructions often do not offer any student autonomy. The paradox is that in the learning process a space for learner autonomy must be created, which is not yet present, but which can only be achieved through the learning process.

VUCA (volatility, uncertainty, complexity, and ambiguity) conditions: One advantage of higher education institutions is the creation of stable learning conditions (e.g. rooms, resources, teaching staff, curricula, examination requirements). All this can be difficult to achieve in the field outside the university. These uncertain conditions create the need for improvisation. For instance, the university should

provide support by assuming the costs of teaching materials, room rentals, travel expenses, teaching staff, and appropriate exam formats.

Communication and interaction issues: Experiences and practices of knowledge sharing are needed in transformative learning. However, students, who go into the field and encounter non-scientific practitioners, are typically not used to communicating their scientific knowledge. Therefore, they must be provided with opportunities for reflection in scientific writing and oral communication.

Digitalization issues: Digital or technology-enhanced environments in educational institutions provide various methods of digital communication which may not be fit for transformative learning. For example, students are challenged to engage in a variety of digitally enhanced cultural practices and thus have to learn to communicate in these spaces. Usually, the university provides the framework, but outside the university, different stakeholders have different tools or practices. Thus, the challenge for students is to create a communicative environment for all participants.

Current forms of implementation in higher education

In transformative learning, concepts of traditional teaching and learning practices grow together in a new design under continuously changing contexts. In *(1) project-based learning*, students conduct research-based projects. Project-based learning can be seen as a direct precursor to transformative learning concepts due to the integration of practical and research-based learning. Project-based learning can become transformative learning in higher education only when the projects are based on scientific knowledge and are being conducted together with stakeholders outside the university to solve a real-world issue (Wildt 2021).

Close to the concept of project-based learning is *(2) problem-based learning*. In this type of learning, students solve predefined problems set by the instructor. Like project-based learning, it has developed in practical contexts, solving problems that arise there (e.g. medicine, where the ability to solve problems is expected). It differs from project-based learning in the narrower definition of the tasks, distinctive structuring of learning, and the standardization of problem-solving procedures (Gibson 2005). However, the choice toward one or the other depends on the intended learning outcomes. Problem-based learning becomes transformative learning in higher education only when the problems are open-ended and the answers are not known, when it is related to real-world issues, and when learners are solving the problems along with stakeholders outside the university.

(3) Research-based or inquiry-based learning integrates learning activities into a research process that ideally ranges from the development of the research question to the theoretical and methodological elaboration of the research process

to the presentation and communication of the results (Jenkins and Healey 2011). Its potential toward transformative learning only unfolds when educational settings and students are connected with actors outside the university (Schneider and Wildt 2002). Research-based learning only becomes transformative learning when the research projects being conducted are linked with real-world problems and students work together with stakeholders outside the university.

(4) Service learning includes sociocultural engagement of students, especially in regional or communal initiatives, and becomes transformative learning in higher education only in connection with research and science.

(5) Living labs are open or public spaces designated to test innovative practice. They can also function as learning spaces suitable for transformative learning.

(6) Simulation: Transformation-relevant topics can also be offered in lectures, seminars, and tutorials, and thus can prepare students for non-academic contexts. One option is simulation, which allows students to learn in a protected space without any real-life consequences. In medicine, for example, simulations are applied in the use of actors as patients, virtual doctor's offices, or hospital wards in the medical clinic. Other examples include case studies at the Harvard Business School, business games in economics, and simulated court cases. Furthermore, virtual spaces open unexploited possibilities for a transformative learning design (e.g. online or remote labs in engineering education to teach sustainability in product design, augmented or virtual reality simulation with immersive learning experiences).

In summary, such learning formats can support transformative learning by slightly revising those learning designs, adding real-world problems for which the answers are not known, and providing opportunities for collaboration with stakeholders outside the university. Transformative learning in higher education has expanded considerably through digital options, while teaching and learning in person limits the potential of transformative learning. For example, the design of transformative learning experience with digital technologies, with consideration of user experience research, opens wide-ranging possibilities for communication and interaction in transformative learning projects.

Learning experience design is built on the concept of active learning through technological support. It is one possible way to design for transformative learning experiences in digital environments and evaluate the quality of such designs (Schmidt et al. 2020). Learning experience design emerged from the field of instructional design and educational technologies. It focuses on the idea that traditional instructional design or learning design lacks the design for enjoyable or memorable experiences (Jahnke 2023). When adding the viewpoint of *experiences*, a design also ensures students experience something special, something they will not forget, or something that leaves an impression on them. This is *memorable experience*, which is typically connected with a positive emotion (Pekrun 2014). To en-

able such positive learning experiences, methods from user experience research can be applied to digital transformative learning. However, contemporary user experience methods do not sufficiently tackle the issues of the learner's interaction with the pedagogical design, the sociocultural dimension, and the diversity of learners (Jahnke 2023). Therefore, the design and development of digital transformative learning focuses on three dimensions of experiences: technological, pedagogical, and social (Jahnke et al. 2020). These three dimensions combine in what is called sociotechnical-pedagogical experience, which embraces social presence, shaping roles and interactions in social relationships so that learners recognize themselves as a community of learners in a digital context. The element of roles alerts the learning designer that teachers should actively design a role shift away from the I-present-myself-and-my-knowledge role to the what-can-I-do-for-you role, so that learning is experienced positively and individual learners are supported individually. The challenge of transformative learning is to include such role structures.

In conclusion, transformative learning, defined as learning in contexts of collaboration with professional and societal actors and supported via digital environments, needs specific conditions to be successful. It offers students an opportunity to solve open-ended, real-world problems that are complex and for which the answer is not yet known (Fischer et al. 2022). That includes considering how to support students in developing competencies so they can learn how to decontextualize and recontextualize scientific knowledge in different contexts both within and outside of higher education. Furthermore, digitally supported environments for transformative learning should allow for a variety of conditions, tools, and apps that may be embedded in a digital learning ecology, which suits both the demands of higher education institutions and the involved groups outside higher education. Educators need to be trained to apply transformative learning. It requires a mindset shift away from traditional teaching to the new roles of the designer of learning processes, including coaching, consulting, and learning companion.

Additionally, students also need training to become active agents (Deslauriers et al. 2019). Therefore, higher education institutions may offer workshops covering project management or solving conflict in teams, for example. The kind of skills needed during transformative learning need to be explicitly communicated. Transformative learning requires certain conditions to establish and promote cultures of participation, to build a learning community where all students feel a sense of belonging, to include diverse group of learners, and to support equity. It also must include the chance to develop skills needed in professional and societal contexts.

By examining the development of transformative learning over time and by observing the success it has produced, the need to further explore and implement this kind of learning is evident. Universities, foundations, and governmental

and political institutions have the duty to lead with more research and development programs, along with necessary funding, to explore transformative learning. More evidence is needed, specifically empirical data on the effectiveness and efficiency of transformative learning designs in use. Such evidence can provide necessary recommendations on how to apply transformative learning and to ask what works, and, more specifically, how it works. In such a vein, we argue for an iterative *research-to-improve* program (see details in Honebein and Reigeluth 2021) for further development of evidence-informed transformative learning.

References

Barr, Robert B., and John Tagg. 1995. From teaching to learning – A new paradigm for undergraduate education. *Change Management* 27 (1): 13–15.

Deslauriers, Louis, Logan S. McCarty, Kelly Miller, Kristina Callaghan, and Greg Kestin. 2019. Measuring actual learning versus feeling of learning in response to being actively engaged in the classroom. *Proceedings of the National Academy of Sciences* 116 (39): 19251–57.

Fischer, Gerhard, Johan Lundin, and Ola J. Lindberg. 2022. The challenge for the digital age: Making learning a part of life. *International Journal of Information and Learning Technology* 40 (1): 1–16.

Freeman, Scott, Sarah L. Eddy, Miles McDonough, Michelle K. Smith, Nnadozie Okoroafor, Hannah Jordt, and Mary Pat Wenderoth. 2014. Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences* 111 (23): 8410–15.

Fry, Heather, Steve Ketteridge, and Stephanie Marshall. 2003. Understanding student learning. In *A handbook for teaching & learning in higher education: Enhancing academic practice*, eds. Heather Fry, Steve Ketteridge, and Stephanie Marshall, 9–25. London: Routledge.

Gibson, Ivan. 2005. Designing projects for learning. In *Handbook of enquiry and problem-based learning*, eds. Terry Barrett, Iain Mac Labhrainn, and Helen Fallon, 27–36. Galway: AISHE and CELT.

Harper, Douglas, ed. 2023. *Transform (v.)*. Available from https://www.etymonline.com/word/transform.

Honebein, Peter C., and Charles M. Reigeluth. 2021. To prove or improve, that is the question: The resurgence of comparative, confounded research between 2010 and 2019. *Educational Technology Research and Development* 69 (2): 465–96.

Howland, Jane L., David Jonassen, and Rose M. Marra. 2012. *Meaningful learning with technology*. Boston, MA: Pearson.

Jahnke, Isa. 2023. Quality of digital learning experiences - Effective, efficient, and appealing designs? *International Journal of Information and Learning Technology* 40 (1): 17–30.

Jahnke, Isa, Matthew Schmidt, Minh Pham, and Kanupriya Singh. 2020. Sociotechnical-pedagogical usability for designing and evaluating learner experience in technology-enhanced environments. In *Learner and user experience research*, eds. Matthew Schmidt, Andrew A. Tawfik, Isa Jahnke, and Yvonne Earnshaw. Available from https://edtechbooks.org/ux/sociotechnical_pedagogical_usability.

Jankowski, Natasha. 2022. Participatory learning system paradigm in the US: Prospective potentials, options, and challenges. In *Professional-scientific education*, eds. Volker Rein and Johannes Wildt, 273–94. Opladen: Budrich.

Jenkins, Alan, and Mick Healey. 2011. Research based learning – A collection of case studies in different disciplines. In *Fachbezogene und fachübergreifende Hochschuldidaktik. Blickpunkt Hochschuldidaktik*, eds. Johannes Wildt and Isa Jahnke, 37–46. Bielefeld: wbv.

Kollmorgen, Raj, Wolfgang Merkel, and Hans-Jürgen Wagener. 2015. *Handbuch Transformationsforschung*. Wiesbaden: Springer.

Lave, Jean, and Etienne Wenger. 1991. *Situated learning: Legitimate peripherical participation*. Cambridge: Cambridge University Press.

Merritt, Richard L. 1980. On the transformation of systems. *International Political Review* 1 (1): 13–22.

Mezirow, Jack. 1991. *Transformative dimensions of adult learning*. San Francisco: Jossey-Bass.

Pekrun, Reinhard. 2014. *Emotions and learning*. Educational Practices Series – 24. Available from http://www.iaoed.org/downloads/edu-practices_24_eng.pdf.

Polanyi, Karl. 1944. *The great transformation: The political and economic origins of our time*. Boston: Beacon Press.

Rein, Volker, and Johannes Wildt. 2022. *Professional-scientific education: Discourses, Perspectives, implications, and options for science and practice*. Opladen: Budrich.

Schmidt, Matthew, Andrew Tawfik, Yvonne Earnshaw, and Isa Jahnke. 2020. *Learner and user experience research: An introduction for the field of learning design & technology*. Available from https://edtechbooks.org/ux.

Schneider, Ralf, and Johannes Wildt. 2002. Forschendes Lernen in Praxisstudien – Das Beispiel des Berufspraktischen Halbjahres in der Lehrerausbildung. In *Neues Handbuch Hochschullehre*, eds. Brigitte Berendt, Hans-Peter Voss, and Johannes Wildt, G 3.1. Berlin: DUZ.

UNESCO. 2017. *Education for sustainable development goals: Learning objectives*. Available from https://www.unesco.de/sites/default/files/2018-08/unesco_education_for_sustainable_development_goals.pdf.

Wagenaar, Robert. 2022. Competence-based development of learning outcome through reference tools: Potentials and limits of cross-educational qualifications frameworks. In *Professional-scientific education*, eds. Volker Rein and Johannes Wildt, 235–44. Opladen: Budrich.

Wildt, Johannes. 2021. Projektstudium. In *Handbuch Transdisziplinäre Didaktik*, eds. Tobias Schmohl and Thorsten Philipp, 243–54. Bielefeld: transcript.

Wildt, Johannes. 2022. Entwicklungslinien der Hochschuldidaktik: Ein Blick nach vorn auf einen "transformative turn" in der Hochschulbildung. In *Hochschuldidaktik gestern – heute – morgen*, eds. Gisela Schutti-Pfeil, Antonia Darilion, and Barbara Ehrensdorfer, 196–207. Linz: FH Österreich