Chapter 3

Theoretical and Methodological Validation of the Action Research: Methodology of the Scientific Study

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Abstract This chapter presents the theoretical and methodological substantiation of the action research, which was used by collaborating research teams from Poland, Lithuania, Finland and Austria for the study “Improving Inclusive Education Through Universal Design for Learning”. The chapter discusses different sociocultural contexts in the participating countries and what led to the research question, which asks “How does the implementation of universal design for learning enrich the practice of inclusive education in different educational contexts?”. This question was looked at in terms of its relevance to the four above-mentioned countries. It can be argued that the action research is favourable for the development of theory and that inclusive education can be changed and reflected by it. The types of action research chosen by the research teams are discussed, those being collaborative, and critical participatory. The cycles of action research and their goals are also presented. Seeking to substantiate the choices of research teams regarding the process and methods of action research, this chapter elaborates on the aspects of action research organisation that are interpreted differently by the researchers: Can the action research be conducted only by the researcher–teachers or can it be carried out by teachers in cooperation with researchers? Is it possible to use a combination of qualitative and quantitative research? The problem with quality and validity of action research is discussed.

Keywords Action research · Transformation of education · Methods of action research

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A. Galkienė, O. Monkevičienė (eds.), *Improving Inclusive Education through Universal Design for Learning*, Inclusive Learning and Educational Equity 5, https://doi.org/10.1007/978-3-030-80658-3_3

3.1 Theoretical Perspective of the Research

The theoretical framework of the study is based on the theory of social constructivism, introduced by Vygotsky (Scheurman, 2018), and theories of educational neuroscience. Scheurman (2018) supports the idea of Piaget's constructivism and explains Vygotsky's theory on how social and cultural contexts influence the authentic construction of a child's understanding. In terms of social constructivism theory, knowledge is co-constructed in the child's interaction with others, as well as with his or her social and cultural environment. The teacher is seen as a collaborator and provides scaffolding (expert support) for learning. According to Wilson (1996), the sociocultural theory of Vygotsky (1978) highlights the significance of the child's authentic learning experiences towards the construction of their own cognitive processes and strategies for world understanding. This is accomplished with the employment of the following cultural tools: scaffolding, dialogue, collaboration and language. The theories of educational neuroscience present a scientific understanding of brain-behaviour relationships, which allow for the development of new learning and teaching strategies (Jamaludin et al., 2019). The above-discussed theories substantiate the understanding of the approach investigated by the Universal Design for Learning and its improvement applied to inclusive education from multiple theoretical lenses (Hackman, 2008, Meyer et al., 2014).

The Goal and Objectives of the Research The purpose of the study is to better understand how the implementation of universal design for learning enriches the practices of inclusive education in different educational contexts.

The objectives of the research are to employ the Universal Design for Learning (UDL) methodology to:

- (a) Reveal the transformations of the educational process in an inclusive classroom
- (b) Identify the educational factors facilitating a student becoming an expert learner
- (c) Reveal the pedagogical competence of teachers for a diverse set of students
- (d) Re-interpret existing inclusive education practices in the classroom

The Context of the Research The research was conducted implementing the project "Preconditions of Transformation of Education Process in Different Educational Contexts by Applying Inclusive Education Strategies" (Erasmus+, No. 2018-1-LT01-KA201-046957, 2018–2021). Researchers and school teachers from four countries and various educational settings, all of whom have been exploring research-based solutions for improving inclusive education, made up the international research team. Researchers from the University of Vienna, Austria, joined teachers from LWS Steinbrechergasse, a local school in Vienna; researchers from the University of Cracow, Poland, teamed up with local teachers from Zespół Szkół Ogólnokształcących No. 9; researchers from Vytautas Magnus University, Lithuania, joined teachers from Vilniaus Balsių mokykla, a school in Vilnius; finally, researchers from the University of Lapland, Finland, partnered with local teachers from Aleksanteri Kenan koulu.

The countries all experience different socio-educational contexts in the implementation of inclusive education. In Lithuania and Poland, inclusive education is still in a phase of active transformation. In Austrian primary schools, it has been actively implemented since 1993 and in secondary schools since 1996 (School Organization Act). However, challenges have been encountered in coping with immigration and socially disadvantaged situations (Galkienė, 2017). National projects have been implemented in Finland since 1997 and have contributed to a wide adoption of inclusive education's main principles. Since 2014, special attention has mainly been paid to ensuring the child's well-being (Galkienė, 2017). At present, the main focus in Finland is on developing the pedagogical competence of inclusive teachers.

In a joint discussion, the international research team identified problem areas in the quality of inclusive education in their countries and directions for its improvement: The concern in Poland centred around the replacement of routine lessons with methods applied by teachers, using the way schoolchildren learn to improve the quality of inclusive education; in Lithuania, it is about the promotion of schoolchildren's self-regulated learning and developing their qualities and abilities in the context of having them be expert learners; Finland aims to develop teachers' professional competencies, which enable them to teach a wide range of students; Austria seeks to re-interpret the existing practices of inclusive education by striving for a higher quality of this type of education. The researcher team also discussed the possibilities of applying UDL to help improve inclusive education in specific problem areas. It was decided that researchers and school teachers from all four countries would implement the UDL approach in schools, and assess its transformative impact in order to improve the quality of inclusive education in the identified problem areas.

3.2 Methodological Approach of the Participatory and Collaborative Action Research

Action Research as Transformational Power The international research team chose action research after taking into consideration the aim and nature of the inquiry in question. This choice was made because such research *is appropriate for planning, implementing, investigating and reflecting on the improvement of inclusive education quality*. A theory is usually developed while action research is taking place. Simultaneously, a practical intervention is introduced to help understand and characterise processes and their results. It is believed that social systems and phenomena are easier to comprehend if attempts are made to change them. According to Cohen et al. (2013), action research is a powerful means for change and improvement. It possesses the potential power to initiate a change at school (Ferrance, 2000). According to Rowe et al. (2013), action research may initiate not only changes that are developmental or transactional but also ones that are transformational. Transformational changes are more radical compared to developmental or

transactional ones because they embrace not only improvement of existing practices, structures and procedures but transformation of values, goals, roles, relations, learning and thinking of individuals, teams and organisations. The researchers state that action research is an efficient methodological approach for developing inclusive education (Charalampous & Papademetriou, 2019; Armstrong & Tsokova 2019).

Action Research Approaches Since one can use it with various approaches, action research is convenient. Researchers frequently systemise action research according to type: individual teacher research, collaborative action research, school-wide research, etc. (Ferrance, 2000), classroom action research, as well as emancipatory, participatory and critical participatory action research (Kemmis et al., 2014). In all types of action research, participants raise questions and solve a real problem in a local environment, in a specific context and with the intention of sharing new knowledge with others. The implementers of the research perform the roles of practitioners and researchers. Thus, action research is conducted in the context of a participatory paradigm and, for this reason, it is referred to as participatory action research. Morales (2016) and Datta et al. (2015) identify other features of action research, such as collaboration among all the participants, co-learning, joint conducting of research and group reflections and creating new knowledge and meaning. Meanwhile, other researchers single out a separate type of action research, i.e. collaborative action research (Ferrance, 2000; Charalampous & Papademetriou, 2019).

Two types of action research—participatory and collaborative—are employed in the present research with an emphasis on the participatory approach, which prevails in participatory action research. However, the process of action research also possesses features of a collaborative approach. Nevertheless, the collaborative approach dominates in the process of collaborative action research but the action research naturally relies on the participatory paradigm.

Participatory Action Research The Austrian team of researchers chose critical participatory action research. While carrying this out, attempts were made to connect all the social groups that were participating in the pedagogical practice and interact through it as a means of introducing changes in existing pedagogical practices at school (Kemmis et al., 2014). According to the above-mentioned authors, critical participatory action research aims to change three areas: the way in which practitioners practice (in this case, teachers and other participants in the educational process), their understanding of their own practices and conditions under which they practice (Kemmis et al., 2014, p. 63). Participatory action research is typically coordinated by the participants themselves, its model being democratic and its success focused on personal and collective change (Morales, 2016; Jacobs, 2016).

Participatory action research proved useful for attaining the goal set by the Austrian team of researchers: to re-interpret existing inclusive education practices in the classroom under the perspective of the UDL methodology. Participating teachers, students and parents identified good practices of inclusive education, as well as barriers that work against it. Together, they developed a research and action plan, and reflected on learner outcomes.

Collaborative Action Research The Polish, Lithuanian and Finnish research teams used collaborative action research, where school and university teachers acted as co-researchers. The Polish group employed collaborative action research to reveal transformations to the educational process that took place when an inclusive classroom employed the UDL methodology; the Lithuanians employed the UDL strategy to identify the educational factors facilitating a student becoming an expert learner. The Finns used it to reveal the pedagogical competencies involved with teaching to a diverse group of students. The participatory action research conducted in Austria included collaboration between university researchers and teachers.

Collaborative action research is considered to be an efficient strategy for transforming a settled practice in schools to achieve clear goals for its improvement and as a way to both improve teachers' professional competencies and create knowledge free from the boundaries of theory and practice (Mertler, 2019a; Rowell et al., 2017, Alber & Nelson, 2002). Some researchers (Kemmis et al., 2014) express a position that action research has to be carried out by teachers themselves, since this type of research involves a self-reflective and self-transformative process. However, the studies conducted by the teachers and researchers working together contradict this approach (Charalampous & Papademetriou, 2019; Kapenieks, 2016). In the research carried out by Olander and Holmqvist Olander (2013), teachers joined researchers to design and reflect on lessons, with the results of one planned and delivered lesson of biology serving as a basis for planning a second and then a third lesson. Olander and Holmqvist Olander (2013, 210) state that teachers' collaboration with researchers allowed them to identify what students do not know and to design efficient lesson models. Moreover, such collaboration "is an important tool and has potential to scaffold teachers' professional development". The results of the research presented by Messiou (2019) show that collaborative action research encourages the development of inclusive thinking and improves inclusive education practices.

The collaborative dialogue of school teachers and university lecturers, which led to deeper reflection, was one of the essential features of "Improving Inclusive Education Through Universal Design for Learning", the international action research presented in this study. Teachers and researchers from Poland, Lithuania, Finland and Austria acted as co-researchers from the first stages of the action research process to the end. Researchers from universities in all the countries chose participating schools and where authorities and teachers would volunteer to join the projects. They also sought out and tested new strategies of inclusive education that aim to improve the quality of both inclusive education and student achievement in their schools. As mentioned above, university researchers and school teachers together held discussions about the problems with the quality of inclusive education in their countries, as well as changes that would need to be introduced. In their joint discussion, all the researchers and school teachers chose the UDL approach, predicting that its implementation could have a transformative impact in improving the quality of inclusive education in the problem areas identified in each country. The researchers and teachers all participated in the training courses, where lecturers from the organisation CAST, which has created and has been developing this approach, presented conceptual and practical aspects of UDL. The researchers and

teachers together participated in the CAST webinars, which focused on such topics as “The conception and principles of UDL”, “Design of socio-educational environment based on the UDL principles”, “Planning the process of education, based on UDL principles”, “Implementation of UDL-based learning-teaching methods in the process of education. Observation and analysis of teaching videos using the UDL lens” and “Designing of UDL-based classroom settings and teaching/learning supplies” (2018). The researchers and teachers shared insights on contextualisation of UDL at school and its use for lesson planning. They looked at this through the prism of striving for a better quality of inclusive education, more ways of learning that best suits students and more goal-oriented learning. After every cycle of action research, a joint discussion was held with the Polish, Lithuanian, Finish and Austrian research teams. Teachers spoke with researchers while they also debated within their own separate groups.

Researchers and school teachers from all participating countries designed models of action research tailored to the problems that had been analysed, devised a three-point plan of action research and set goals for each phase. Discussing with the researchers and collecting data from others participating in the education process (learners and parents), the teachers from Poland, Lithuania and Finland identified the strengths of inclusive education, areas for improvement, and barriers in the educational process that prevent students from experiencing learning success in their schools. They also foresaw UDL-based actions that would eliminate barriers in the education process. Together with teachers, the researchers discussed the methods of data collection. The researchers observed the lessons delivered by teachers and, based on the results of previously taught lessons, discussed with teachers the planning of new lessons. The application of a UDL approach during lessons was also discussed among teachers. The teachers alone, as well as with the researchers, reflected on the results, problems and barriers of each cycle of action. As mentioned above, participatory action research was carried out in Austria, where teachers, students, parents and researchers participated in all stages.

To ensure the success of the joint researcher–teacher approach, researchers need to establish certain principles and conditions: a two-way empowering relationship with teachers (Datta et al., 2015); a clear discussion on research methods and process, as well as roles; scaffolding that helps teachers plan their activities (Mertler, 2019b); reflections and participation in the learning process to form the foundation for improving teachers’ educational practice; reflections that need to be grounded in mutual trust and open to discussions surrounding difficulties (Insuasty & Jaime Osorio, 2020). All these conditions had been embedded in our research, with the resulting collaboration between researchers, teachers and other participants in the action research being warm, open and based on critical dialogue, reflection and scaffolding.

3.3 Cycles of Action Research

Action research is a cyclical process that involves identifying areas where there are problems and room for improvement, devising an action and implementation plan, setting up data collection, assessing and reflecting action and changes, and modifying the action plan. These all need to be considered for results to occur (Ferrance, 2000; Cohen et al., 2013; Charalampous & Papademetriou, 2019). Models of action research vary. Although the research teams from Poland, Lithuania, Finland and Austria applied different models of action research, all but one comprised three cycles (with Austria comprising two), which we present below.

The first cycle is aimed at analysing the context of inclusive education's problem areas that were identified in Polish, Lithuanian, Finnish and Austrian schools, as well as identifying a specific research problem. Applying the UDL approach in the school of each country, best practices for organising inclusive education were evaluated and student learning barriers were identified from the perspective of teachers and students (The Austrians and Poles also identified barriers from the perspective of parents). Possible areas for improvement were identified, as were how the application of UDL can contribute to that improvement.

The second cycle applies the UDL approach as a means of eliminating student learning barriers identified in the first cycle and to improve the quality of inclusive education. Traditional routine teaching and learning was replaced with an educational process grounded in the principles of UDL; the UDL approach was applied to help develop the qualities of students as expert learners; practices of inclusive education were re-interpreted and renewed in the context of the UDL approach; in the process of inclusive education and applying the UDL approach, teachers came together to reflect on the competencies that help them facilitate teaching a diverse set of learners. This second-cycle reflection touched on changes in the practice of teaching and learning, as well as in the attitudes of teachers and other participants, the factors that enhance the quality of inclusive education, and unresolved or newly identified barriers to student learning.

In the third cycle, the UDL approach was applied seeking to enhance the good practices of inclusive education, which had been modelled in the second cycle, and to eliminate the barriers to students learning, which had not been coped with in the second cycle or emerged anew. The change in the practice of teaching and learning as well as in the attitudes of teachers and other participants in the process of teaching, the factors that strengthen the quality of inclusive education, unresolved or newly identified challenges to further improvement of the quality of inclusive education students' learning were reflected on in the third cycle. The third cycle of action research conducted by Finnish researchers focused on reflecting the teachers' competence to work with a diversity of students in the classroom applying UDL.

It just so happened that due to the coronavirus outbreak the schools faced a problem in the third cycle of research. Challenges with distance learning begat new questions: How can the inclusive process be organised in the online classroom and made accessible to all students, including SEN learners; What are both the

advantages and disadvantages of distance learning that make it possible or impossible to ensure inclusion for all students or individual learners; How does the UDL approach help to adapt to unexpected challenges and make the experience more dynamic?

3.4 Research Methods

The data collection in the action research aims to identify a specific problem, to then foresee what will be improved prior to devising an action plan. Implementing it requires reflection on changes in practices and attitudes and factors that had led to those changes (after implementation of action plan). The accumulated data enable understanding of what is going on in the classroom and what participants in the process of teaching and learning think about and how they approach their work. It also helps to identify actions that can stimulate changes that result from a specific action and how that result can be predicted and achieved. The methodology of action research is associated with a qualitative paradigm over a long period of time. For this reason, it seemed most appropriate to apply qualitative data collection and analysis methods (Dosemagen & Schwalbach, 2019, 163). However, other researchers have expanded the field of methods applied in the action research and have used a mixed research approach (i.e. combining qualitative and quantitative methods) (Charalampous & Papademetriou, 2019). While they evaluated and understood their work by applying qualitative methods, their results were measured with quantitative methods (Parker et al., 2017). Ivanova and Wingo (2018) substantiated conceptual, philosophical and procedural aspects of using a mixed-method approach in action research. A multi-method approach is applied in the presented research, applying either qualitative research methods on their own or combining both qualitative and quantitative (Charalampous & Papademetriou, 2019). Various methods of data collection and analysis were used: interviews, diaries, video and audio recordings, questionnaires, etc. (Ferrance, 2000). It should be noted that qualitative methods of data collection and analysis prevail even when a mixed approach to research methods is followed.

A multi-method approach was applied in the research conducted by the Polish, Lithuanian and Finnish research teams while a qualitative research approach was applied in the research conducted by the Austrians. A more detailed description of applied methods is provided in chapters where the research results are presented.

The action research was conducted following all the ethical requirements. Informed consent (from students, their parents, teachers, school authorities) was obtained. To ensure confidentiality, the names of children and teachers were changed to pseudonyms and no details that could be linked with a particular person were presented. While writing the study, the participants in the research were provided with information on the research results.

3.5 Quality and Validity of Action Research

Bradbury et al. (2019, 25) state that the quality of action research is ensured by (1) clearly defined goals, (2) partnership and participation, (3) contribution to action research theory practice, (4) appropriate methods and process, (5) actionability, (6) reflexivity and (7) significance. To ensure the validity of action research, researchers have to adhere to principles that ensure the research quality (Dosemagen & Schwalbach, 2019).

The validity of the action research conducted in Poland, Lithuania, Finland and Austria is guaranteed by the quality of its organisation. The common goals of this research and the aims of the first cycle were discussed and elaborated on in the joint meeting. The aims of the second cycle of action research emerged after reflections on the first cycle by the teams of each country and were discussed in the joint meeting of all the countries. The aims of the third cycle were based on the reflections of the second cycle and were discussed in by analogy, ensuring a clear and precise definition. The validity of research methods and procedures was ensured by the responsibility for their design, assumed by university researchers, active discussions with teachers in the research process and from analysing and reflecting on the data.

As stated, a participatory and collaborative approach to the research was followed at all stages. Continuous reflection was held at different action research stages, allowing for all the participants to engage in the action research.

The use of UDL's theoretical approach for introducing changes to inclusive education practices ensured a connection between theory and practice. The teachers devised plans for UDL-based lessons and, during the course of their implementation, the impact on students' participation in the lessons was observed, their choices of learning that were convenient to them, expressing the qualities of the expert learner and having an influence on student achievement. It was also observed and reflected on whether action research helps in coping with challenges encountered by schools and whether or not it provides any benefit to all the participants in the process of teaching and learning. All this created pre-requisites for re-interpretation of the very UDL approach from the perspective of its application in different socio-educational contexts for different purposes.

Limitations of Action Research The results of action research are context-specific and, therefore, cannot be generalised (Dosemagen & Schwalbach, 2019, 162). The results of one study cannot be applied when making predictions or conclusions about other groups. On the other hand, the processes of action research disclose how considerable changes can be modelled and implemented in different local contexts, how transformative social learning occurs when dialogue based, creative methods that change practice are applied. Action research encourages teachers' engagement in solving complex problems in the local context. Moreover, according to Bradbury et al. (2019, 27): "action research liberates learning from a consolation of facts to taking our own experience seriously".

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