

Learning by Teaching: A Pathway to Educational Justice

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Abstract

Educational institutions worldwide face complex challenges shaped by the dynamics of a VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) world, impacting both learners and educators. In response to these challenges, ensuring educational justice requires inclusive strategies that accommodate diverse needs, fostering equity and participatory learning. The Learning by Teaching (LbT) approach, developed by Jean-Pol Martin, offers a transformative model where students take on the role of teachers, promoting both cognitive and social skills while strengthening individual autonomy. Rooted in historical pedagogical traditions, LbT is not just a teaching method but a holistic, needs-oriented didactic principle applicable across disciplines and educational levels. The effectiveness of LbT is evident in its ability to enhance motivation, critical thinking, and cooperative learning. Despite implementation challenges, LbT remains a flexible and resource-efficient approach that prepares learners for real-world complexities. This article explores its theoretical foundations, historical development, practical applications, and potential as an inclusive, future-proof educational paradigm.

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Introduction

Educational institutions around the world today face complex problems that affect learners, teachers and educational locations, which can be understood as a reflection of society and thus as components of a VUCA world¹ (Damé et al., 2022; Rakhkochkine & Steier, 2019; Tillmann, 2020). In terms of educational equity and equal opportunities, interventions, methods and strategies that avoid or reduce exclusion on the basis of need, gender, religion, socio-economic situation, sexual or political orientation and ethnic origin are important for all those involved in the learning process (Deutsche UNESCO-Kommission e. V., 2014a, 2018, 2019). Inclusion as an expression of participatory justice is a global goal for freedom of development, educational justice and equal opportunities. It represents an educational policy paradigm that goes beyond prohibitions of discrimination and logics of equality and anti-discrimination and forms a human rights imperative (Deutsche UNESCO-Kommission e. V., 2014a, 2014b; Fineman, 2020; Winkler, 2021). The learning effectiveness or learning success of methods and learning conditions are usually identified as relevant benchmarks for these². Learning by Teaching by Jean-Pol Martin can be seen as an important approach in this regard: In Learning by Teaching (LbT = German: Lernen durch Lehren/LdL), students become teachers through methodical application and needs-oriented empowerment. The resulting

teaching by students enables much more than "teaching for all" but teaching by all for all and, through its needs-oriented empowerment approach, also prepares learners for the acute constellations of the (surrounding) world (Kolbe, 2021). In this article, LbT is introduced as an approach and some recommendations for implementation are presented.

LbT as a historically evolved learning and teaching principle for the modern age

Today, LbT is mentioned globally and interdisciplinarily in studies and specialist articles and its implementation is taken up in various school types and grades as well as in various educational institutions, extracurricular programs or at universities (Adamson et al, 2021; Antonova, 2024; Chrostowski, 2024; Kelchner & Martin, 1998; Kolbe, 2019a, 2019b, 2024a; Kolbe et al, 2024; Kolbe & Oberhauser, 2020; Maia & Tercete, 2017; Martin, 2018a; Oberhauser, 2020; Schuhladen, 2020; Speth-Schuhmacher, 2019).

LbT (Learning by Teaching) was developed in the 1980s by Prof. em. Dr. Jean-Pol Martin and is based on the principle of manifest role reversal between teachers and learners. During his practical research, Martin realized that students in his French classes learned better when they took on teaching roles themselves. From the late 1980s onwards, he integrated these findings into didactic concepts, which were confirmed by practical applications and long-term studies (Kelchner & Martin, 1998).

Learning by Teaching (LbT) is neither a classic nor a completely new method. Historically, numerous parallels can be found. Seneca already refers to the principle of mutual learning in his

¹ Learning today takes place in a world characterized by volatility, uncertainty, complexity and ambiguity (VUCA). The term VUCA originally comes from the military sector and has been adopted in the areas of management, civil society, business and organizational development. It describes both global and

organizational, spontaneous changes (volatility) as well as the resulting uncertainty, complexity and ambiguity for individuals, institutions and societies (Lenz 2019a, 2019b; Mack et al. 2016).
² <https://visible-learning.org/> (accessed 04.02.2025)

"Epistulae Morales ad Lucilium" (Letter 7). He emphasizes the importance of Learning by Teaching and argues that although people should learn from more capable people, the act of teaching creates a form of equality among learners (Seneca, 2018, p. 38). A LbT-oriented statement can also be found in the well-known philosopher and educator Johann Amos Comenius (1592-1670): "He who teaches others teaches himself" (Bowermaster, 1986, p. 20).

The Swiss philosopher and educator Johann Heinrich Pestalozzi also recognized the potential of Learning by Teaching and developed these ideas further in the context of practice- and needs-oriented pedagogy. He not only emphasized the value of diversity and inclusion, but also the ability of learners to develop teaching skills autonomously within a group. In his "Stanserbrief" (around 1799), he describes observations which show that children imparted knowledge to other children and achieved learning success themselves. Pestalozzi, who benefited from these experiences himself, actively promoted mutual help, whereby the children not only supported weaker children but also made a greater contribution to the community than formal teachers. (Pestalozzi & Klafki, 1973, p. 33). Further references to LbT can be found in the literature, which then work with comparable ideas. Some of these early mentions of LbT are located in the USA and demonstrate the importance of this approach for the educational landscape. Riessmann (1965), for example, describes LbT as a revolutionary proposal in education that represents nothing less than a time "for a moon shot in education" (Riessmann 1965, p. 1)

In their interpretation, Frager and Stern (1970) focus on teaching "older" people to "younger" people (Frager & Stern, 1970). In Gartner et al. (1971), the "children teaching children" approach also provides indications of LbT (Gartner et al., 1971). Steinig (1985) also addresses Learning by Teaching (LbT) in his report on reciprocal German lessons for pupils with migration experience (Steinig, 1985). Schiffler (1980) takes up other comparable approaches, assigning small teaching tasks to learners in order to loosen up the lessons and promote activating learning processes (Schiffler, 1980). A little later, LbT is described as a form of cooperative learning arrangement (Renkl, 1997, pp. 17-19).

In addition to the historical references, Learning by Teaching (LbT) is based on various theoretical approaches, including structural-realistic behaviorism, cognitive psychology as well as communication and interaction theories. LbT therefore fulfills the criteria of a method, as it is based on a sound theoretical concept. However, its particular advantage lies in its ability to combine and link already established methods, approaches and findings in a coherent theoretical framework (Stelzer, 2009, p. 180).

Abendroth-Timmer (2000) identifies LbT as a holistic didactic principle with methodological diversity. Widła (2021) sees LbT as an approach that is both contemporary and a form of pedagogical reversal that can meet the challenges of today's didactics. LbT is understood here as an enabling approach that empowers learners to explore the world at their own pace and share knowledge through a culture of collaboration (Widła, 2021, pp. 155-165). Chrostowski (2024) takes a similar view, describing LbT as a useful approach for religious education with its "*demand for relevance to the lifeworld and subject orientation*" (Chrostowski, 2024, p. 301).

After the early groundwork, especially in collaboration with Jean-Pol Martin, a large number of publications were produced that deal with the practical implementation and theoretical foundation of the approach. International adaptations, for example in English and German lessons in Taiwan and Japan, demonstrate its worldwide relevance. LbT also serves as the basis for concepts such as peer teaching and is used in various disciplines, including robotics, economics and virtual learning environments. (Becker, 2024; Jamet et al., 2018; Okita et al., 2013; Serholt et al., 2022). In the tradition of the original form of application, however, the majority of publications are dedicated to foreign language learning and teaching (Adamson et al., 2021; Berger et al., 2011; Cau, 2015; Chang, 2009; Graef, 1994; Grzega & Klüsener, 2013; Guttenberger & Grupe, 2011; Iberer, 2011; Kelchner & Martin, 1998; Kolbe, 2019a, 2019b; Kolbe & Oberhauser, 2020; Kratky & Schultheis, 2011; Martin, 1982, 1985, 1986, 1994a, 1994b, 2018b, 2020; Oberhauser, 2020; Oebel, 2009a, 2009b; Reichardt, 2012; Schelhaas, 2003; Spannagel, 2011; Speth-Schuhmacher, 2019; Tacke, 2011; Thomä, 2016; Weber & Yoshii, 2009). Further adaptations can be found for geography lessons (Rinschede & Siegmund, 2018) or for English lessons for gifted pupils (Thomä, 2016). In summary, LbT can be described as an action- and needs-oriented approach in all conceivable learning processes (Berger et al., 2011; Cau, 2015; Graef, 1994; Martin, 2020; Reichardt, 2012; Schelhaas, 2003; Thomä, 2016).

LbT by All for All: Effects

LbT is therefore an integral method or didactic principle that aims to promote the independent acquisition of skills and the curiosity of learners in the context of their lives and interests. It supports learners in discovering individual ways of learning and teaching. Due to its flexibility, LbT is future-proof, independent of technical requirements, resource-saving and universally applicable - regardless of location or institution. The number and selection of publications leads to the conclusion that Learning by Teaching can be successfully applied in practice at least as a selective method, but better as a continuous learning-teaching approach for all school types, subjects, pupil compositions and age groups and is still an adequate alternative form of learning today.

LbT promotes responsible, democratic cooperation between all learners. It strengthens problem-solving skills, communication skills and the ability to interact cooperatively based on human needs (Kolbe, 2019a, 2019b; Molitor, 2019; Ruetz, 2020). LbT can be divided into general didactic approaches and specific teaching applications. In the generalist perspective, it is based on two central needs of learners: the desire for control over their own learning and the motivation to explore new fields of learning and acquire knowledge. (Kelchner & Martin, 1998, pp. 211-212). Martin (1994) describes four relevant aspects that characterize LbT as a future-oriented approach: The orientation towards essential human needs (1), the orientation towards the requirements of human rights (2), the emerging participatory competencies (3) and the developing network sensitivity (4) (Martin, 1994b).

Another key motivational factor in the LbT application is the flow experience. It describes a state of increased ability to act and awareness in which focused action can be continued effortlessly and in a controlled manner. (Martin, 2000). Csikszentmihalyi provides the basis for the flow mentioned in LbT (Csikszentmihalyi, 1990). The connection between LbT and the flow model can be seen in the fact that committed

learning is the key to learning success. The decisive factors here are the active involvement of learners and the change of roles from teachers and teaching to a participative learning culture (Shernoff & Csikszentmihalyi, 2009).

In LbT lessons, students take on the role of teachers for their classmates, which teaches them to differentiate between important and unimportant information. They select content themselves, which strengthens their didactic autonomy. By planning and imparting knowledge independently, they develop cooperative skills, improve their communication, reflect critically on content and promote their explorative learning. They lead reading exercises, ask questions, plan teaching units and moderate discussions. In doing so, they continuously check the understanding of their fellow learners and evaluate their learning progress, often using methods they have developed themselves. In this way, everyone is actively involved in the learning process (Kelchner & Martin, 1998; Martin, 2000).

LbT has numerous positive effects: the teacher's speaking time is reduced, while pupils actively shape up to 80% of the lesson time. Learning content is viewed from the perspective of the learners, which leads to individually adapted learning processes. By working in groups, students engage more intensively with the material, express ambiguities more easily and ask specific questions. Teachers can recognize gaps in understanding more quickly and respond to them in a targeted manner. In addition, LbT promotes social learning, as students take on new roles and work cooperatively. This results in motivated, self-directed, socially interactive and action-oriented learning (Martin, 1994b, 2002a, 2002b, p. 8).

Abendroth-Timmer (2000) also records various positive effects of LbT on teachers and learners: an increase in commitment to the lesson, an increase in speaking time and a reduction in inhibition thresholds, an increase in social integration and optimized learning performance through more intensive engagement with the learning material (Abendroth-Timmer, 2000, p. 118). Grzega and Schöner (2008) also recognize that LbT- lessons lead to more expert knowledge and communicative skills, which prepares learners for the demands of today's rapidly changing requirements (Grzega & Schöner, 2008, p. 173). In his first articles on LbT, Martin also points (here with Kelchner, 1998b) to future developments in the educational landscape and to changing social and technical conditions, for which LbT should be seen as a response (Kelchner & Martin, 1998, p. 212).

In LbT, the role of the teacher remains central, but changes fundamentally. They not only provide curricular content, but also enable the students to shape the lessons didactically and interactively. Their role is regulatory and supportive: they only intervene in the event of significant content-related or social problems and ensure that all learners remain involved in the process. The increased personal responsibility of the students creates scope for the teacher to provide targeted individual support. Although the teacher remains the responsible authority, they act primarily as an advisor, source of inspiration and learning guide. They promote exchange, provide methodological suggestions to avoid monotony and create an atmosphere conducive to learning. LbT thus marks a didactic paradigm shift: teachers not only internalize specialist knowledge, but also learn to balance between active support and targeted restraint. Teaching becomes a joint process of knowledge construction at eye level (Kelchner & Martin, 1998; 1994a; Martin & Oebel, 2007).

LbT conserves resources and can serve as partial compensation for the global shortage of teachers. The active involvement of learners creates time freedom and better observation opportunities, which make it possible to respond more individually to the developmental stage, skills and socio-emotional needs of the pupils - much more effectively than in traditional frontal teaching (Forsa, 2015; Grzega & Schöner, 2008, p. 170; Marin, 2014; Schuhladen, 2020; UNESCO, 2019)

LbT also appears to be a sensible solution option for the aforementioned conditions of the VUCA world, which empowers people instead of just preparing them. According to Broszio (2024), LbT offers an effective response to the challenges of the VUCA world by strengthening the necessary agility and resilience for dealing with uncertainty and complex developments through active knowledge construction, flexible design of learning content and the promotion of key skills such as learning ability, teamwork, communication skills and self-efficacy (Broszio, 2024, p. 141).

Criticism, implementation and application of LbT

The implementation of LbT is challenging. There is criticism of the amount of time required for the introduction, the increased workload for all those involved and possible losses in learning effectiveness and partial content. In addition, implementation can be challenging depending on the type of school, and there is a risk of overtaxing pupils if meta-knowledge, learning and methodological skills are lacking (Werner, 2005). These points of criticism are taken up by Martin (2000) and clarified as requirements for the teacher: LbT is not an approach that requires less work and preparation. Rather, it can be assumed that the teacher must engage more intensively with the learning material: This means that the more comprehensively this approach is applied and the larger the classes/learning groups are, the more demanding the learning group is and the more extensive and complex the learning material is, the more work the teacher has to invest in the implementation of LbT (Martin, 2000). It is therefore not surprising that the LbT application requires a great deal of effort and that students and teachers should be prepared consistently and correctly. Modified applications or test scenarios that do not or only partially implement the central aspect of role reversal, as in Renken (2008), for example, also show results that are unsatisfactory in terms of learning effectiveness (Renken, 2008, pp. 151-152).

People who LbT in practice see things differently: In a micro study, the learning effectiveness of Learning by Teaching (LbT) was examined from the perspective of teachers on the basis of the three central dimensions of teaching quality: cognitive activation, classroom management and social support (Helm, 2016; Klieme et al., 2009; Klieme et al., 2001; Pianta & Hamre, 2009). Building on Martin's habilitation thesis (1994b) and the didactic relevance of LbT in the context of the Hattie study, the influence of LbT on learning processes is examined from the perspective of LbT practitioners. The modified items are based on Helm (2016), Rakoczy et al. (2005) and Reeve et al. (2008). A very small quantitative online survey (n=18) was used to record evaluations of LbT with regard to individualization, cognitive activation, social integration and well-being. The results indicate positive effects of LbT in terms of finding individual solutions, promoting skills and social integration, while challenges in practical implementation were identified. Methodological limitations relate to the small sample size and the focus on subjective self-assessments. The study provides

initial indications of the multidimensional effectiveness of LbT and highlights the need for more in-depth empirical analyses. Nevertheless, LbT requires extensive preparation, as teachers have to deal intensively with the subject matter. The larger the learning group and the more complex the subject matter, the more challenging the implementation. However, LbT aims to do more than just assess performance: it promotes life and everyday skills as well as the joy of learning and working together. LbT offers potential in inclusive education in particular, as learners and teachers can react flexibly and independently to challenges and technological possibilities (StMUK, 2015; Weisen et al., 1994). In addition, it can be assumed that the implementation of LbT will also encounter individual and structural resistance, which has already been recorded in the past (Graef, 2024; Martin, 2024; Zirkelbach, 2024). It can be assumed that an explanation of the conditions for implementing LbT can already be very helpful in testing LbT in practice. The following section contains a compilation by Kolbe (2024b), who has already restructured the basic literature on LbT (Kolbe, 2024b)

In one of the first works on the implementation of LbT in foreign language teaching, Martin describes the following four conditions for "socially integrative teaching":

- Transparency of the learning objectives (product) and consensus on them
- Transparency of the teaching method (process) and consensus on it
- Creating spaces for self-determination
- Enabling an authentic interactive discourse.

These conditions, which have been recorded for almost every learning environment, are still an elementary component of adequate LbT-lessons today (Martin, 1982, 1986), but can also be understood as a general recommendation. With reference to Martin's work, Rinschede and Siegmund (2018) have outlined a process for the implementation of pedagogical designs in school lessons. Although this was originally designed for geography lessons, this process can be identified as a suitable option for implementing pedagogical designs (Martin, 1986; Rinschede & Siegmund, 2018, p. 259). The central points were taken up, but relevant aspects were added or expanded to include the point "LbT preparation". The four basic conditions must be implemented in advance. This results in six steps for the implementation of LbT.

1. Preparation for LbT: The introduction of LbT must be carefully prepared and can be formulated as a question to clarify the learning constellation, which is divided into five dimensions: Where (1) to whom (2) what knowledge (3) should be imparted at what time in what period (4) and how must this knowledge be checked (5)?

(1): Nature of the learning location (school/classroom, etc.)

(2): Composition of learners (number/special needs/experiences/life situations, etc.)

(3): Subject matter (scope/format/level of difficulty, etc.)

(4): Time constellation (time, period for learning units, deadline until the exam, etc.)

(5): Form of examination (oral examination, written examination, etc.)

2. Introduction of LbT: In the introductory phase, the teacher explains the model and concept of LbT to the learners and distributes the first work tasks that can be carried out temporarily. These tasks can already be organized autonomously and democratically by the learning group. The basic conditions mentioned above are introduced and internalized.

3. Independent lesson planning: The learners take over the planning of the lesson right from the start. The teacher provides the learning material or enables access to relevant materials - full or in part, depending on the situation. The students process the information, reflect on it and decide together which content they want to teach and how. The condition is that all decisions are made collectively to avoid isolated learning. Preparation can take place both at school and at home. The teacher documents the results and accompanies the process in an advisory capacity.

4. LbT teaching implementation: The students implement the planned knowledge transfer independently and take on the role of teachers. They organize the lessons, document the results and prepare homework. The teacher continues to act as an observer and is on hand to advise the students and provide methodological tips where necessary.

5. Performance assessment: The performance assessment is developed and carried out by the learners together with the teacher. The applicable framework conditions, examination regulations and school guidelines are taken into account. In addition to traditional grading, space is created for self-determined feedback through peer feedback or self-generated certificates.

6. evaluation of LbT by students: Learners evaluate the process using feedback formats they have developed themselves or selected, such as anonymous questionnaires or feedback rounds. This feedback is used to reflect on and optimize the LbT lessons. The teacher documents the results and uses them to continuously improve the lessons.

Although these steps seem simple at first, it should be noted that they are influenced by the complexity of the learning content, the heterogeneity of the learners, the framework conditions of the learning location and the tasks and roles of the teacher. The more these factors intertwine, the more challenging the implementation becomes.

Conclusion

The literature shows that LbT is also suitable for selective use, although the effort required for full implementation is significantly higher than for selective use or the use of traditional forms of teaching. The number and scope of publications offer insights into the practical application and interested parties can find extensive information. This article is intended to serve as a basis for various attempts at application and to underpin the potential of LbT. Nevertheless, the collected findings invite intensive research projects such as meta-studies and quantitative analyses to realistically measure the learning effectiveness of LbT in diverse learning environments. There are gaps and systems here, and old findings need to be checked for their validity. More recent studies already appear to close these gaps: In Zhou et al. (2019), LbT is positioned and examined as an approach between learner-centered and learner-directed education. The large-scale field experiment by Sha (2024), which uses randomized control groups to investigate the influence of different learning methods on learning success, appears promising and well-founded. Further results are eagerly awaited.

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