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Editorial: Effective teaching: Measurements, antecedents, correlates, characteristics, and links with outcomes

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Editorial on the Research Topic
Effective teaching: Measurements, antecedents, correlates, characteristics, and links with outcomes

A growing desire for improved quality in education has been evident throughout the world. While some scholars are focused on the technical aspects of teaching, others are exploring how, why, when, and for whom certain factors contribute to educational achievement and success. Effective, quality education suggests the need to understand the key stakeholders within the education system—the teachers and students. However, although research on effective teaching has existed for over half a century, the knowledge base is limited. There has been a heavy reliance on using student achievement as an outcome criterion but, more recently, non-cognitive psychological outcomes have been acknowledged as important factors for improving the effectiveness and quality of education. This Research Topic included 14 articles that contribute to advancing the knowledge base on teaching effectiveness and its complex measurements, antecedents, correlates, characteristics, and links with cognitive and non-cognitive outcomes. We intend that the Research Topic will stimulate international discussion and inspire future work for advancing the field and its impact on research, practice, and policy.

1. Introduction

This Research Topic is grounded in the relatively recent Global Effective Teaching and Learning Network (GETLIN) network[1]. This network was established as a result of the International Comparative Analysis of Learning and Teaching (ICALT3/Differentiation) project led by the University of Groningen (2015–2022). The project brought together researchers, educators, practitioners, and policymakers from over 17 education system to share knowledge and exchange ideas about teaching quality improvement. This project paved the way for continuous cooperation in effective teaching among key educational

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1   GETLIN was initially established during the final ICALT3/Differentiation conference from 26 – 28 July 2021 in Groningen, the Netherlands.

stakeholders in numerous countries across the five continents. This Research Topic is partly the result of this international collaboration, which complements two other book publications on effective teaching in an edited volume titled *Effective teaching around the world: Theoretical, empirical, methodological and practical insights* (Maulana et al., 2023a) and a monograph titled *Differentiated instruction in teaching from the international perspective: Methodological and empirical insights* (Maulana et al., 2023b).

Teaching is a complex activity in a highly complex environment. Although our understanding of effective teaching has significantly widened over the last century, major gaps remain. What constitutes "effective" teaching differs from one context, time, and group to another. As Ko et al. (2014) noted, defining effective teaching can be complex and controversial due to its associations with professional competency and system accountability. In general, the scope of effective teaching can be defined in two ways. The first definition focuses on processes *inside* the classroom and is generally referred to in terms of the focus on teacher behaviors and classroom processes that promote better student outcomes. The second definition takes a broader view, including factors *beyond* classroom processes, based on the notion that teachers' work is not restricted to instruction alone (Ko et al., 2014). In the 21st century, the role of a teacher extends beyond classroom processes, and includes, inter alia, collegial coaching and cooperation, teacher leadership, and engagement in continuous professional development.

Scholars tend to agree that effective teaching invokes *change* in outcomes. This claim supports the work of Maulana et al. (2023a). Previously, emphasis was put on change in cognitive outcomes (i.e., test scores). In contemporary education, the importance of viewing change in terms of non-cognitive outcomes has been identified. In addition, viewing change not only from student outcomes but also teacher outcomes has been highlighted. This Research Topic was chosen based on the premise that effective teaching is closely linked to teachers as crucial agents for change in students, and their professional, learning. It discusses multiple issues of effective teaching, including its measurements, antecedents, correlates, characteristics, and relationships with outcomes.

For this Research Topic, we have attempted to identify the developing field of effective teaching by looking at this complex and admittedly contested concept from a wide variety of perspectives worldwide. We hope that this Research Topic will stimulate further discussion on effective teaching and invite scholars to connect and cooperate to contribute to improving the knowledge base by bringing unique expertise, experiences, and interests from multiple contexts around the globe.

2. The papers

Table 1 provides an overview of papers included in this Research Topic (see Table 1). Although the topic focuses on effective teaching, it should be noted that the papers address both direct and indirect forms of effectiveness. We interpret this variation as a representation of effective teaching, which is complex by nature and encompasses broad concepts. As can be seen in Table 1, the papers included in this Research Topic

cover diverse components of effective teaching, methods, and education levels and originate from diverse education systems. It is important to note that all the papers address multiple issues (e.g., measurements, characteristics, and links with outcomes) of effective teaching. Table 2 summarizes specific components of the 14 papers concerning effective teaching.

Based on the broader and contemporary definitions of effective teaching, the papers can be divided into groups based on two dimensions of effective practice; (i) within-classroom processes and (ii) factors beyond classroom processes.

2.1. Effective teaching within the classroom processes

A total of seven articles address effective teaching within the classroom processes. All of these uniquely present various dimensions of effective teaching with some conceptual overlaps.

The paper by Yang et al. presents a systematic literature review of the link between teachers' autonomy support and student engagement using the PRISMA method, a scoping systematic review approach. Primary, Secondary, and Higher Education studies from various education systems are represented. Their study sheds light on trends regarding autonomy support and engagement in terms of landscapes, methodology, characters, patterns of studies, and autonomy-supportive strategies. They found limitations in the current literature on autonomy support and engagement and pointed to the need for further longitudinal studies on specific autonomy-supportive teaching strategies to maximize student engagement.

Li et al. report on university students' perceptions of motivational lesson climate, engagement, and achievement when enrolling in English classes in Northeastern and Mid-eastern China. Student questionnaires were used to measure perceptions of motivational climate and engagement. The final English test score was used as a measure of achievement, and exploratory and confirmatory analysis, regression, and path analyses were employed. This study reveals the important predictive power of perceived motivational climates on perceived engagement. The paper concludes that English language teachers in China exhibit certain aspects of effective motivational climates, but other aspects of motivational climates need to be improved to maximize student engagement and achievement.

The paper by Ouwehand et al. examines the relationship between school composition (i.e., student socio-economic status (SES) and migration background), workload, and teachers' utility values toward teaching and teaching quality (i.e., classroom management, cognitive activation, clarity of instruction, and teacher-student relationship) in Dutch secondary schools using TALIS 2018 data. Data were gathered using teacher and school leader questionnaires and were analyzed using a multilevel modeling approach. The study reveals that certain dimensions of social utility value matter in predicting teaching quality. SES was also shown to relate to certain dimensions of teaching quality, suggesting that different dimensions of SES matter more for specific dimensions of teaching quality.

TABLE 1 A summary of papers included in the Research Topic.

Research Topics	Type	Approach	Location	Education level	Method and measure	Focus
1. Yang et al.	Systematic review	Scoping systematic review	International	Primary, Secondary, Higher Education	Longitudinal, PRISMA method	Teachers' autonomy support, Student engagement
2. Li et al.	Original research, 2 studies	Quantitative, factor analysis (EFA and CFA), regression analysis, path analysis	Northeastern China, Mid-eastern China	Higher education	Survey using student questionnaire	Motivational climate, Student engagement, Student achievement
3. Ouwehand et al.	Original research	Quantitative, multilevel analysis	Netherlands	Secondary schools	Survey using teacher and school leader questionnaires	Teaching quality: classroom management, cognitive activation, teacher-student relationship school population composition: SES, migration background workload, teacher utility values toward teaching
4. Gomariz et al.	Original research	Quantitative, factor analysis (EFA, CFFA), structural equation modeling	Spain	Early childhood, primary, secondary education	Survey using teacher questionnaire	Teacher facilitation of family participation: communication with the center, participation in school activities, sense of belonging, involvement in the home, involvement in the pa and the school board, community participation, training
5. Melguizo-Garín et al.	Brief research report	Quantitative, descriptive, correlational, multiple regression analyses	Spain	Higher education	Survey using student questionnaire	Analysis of cooperation in higher education: conception of group work, usefulness of group work, planning of group work by teachers, criteria for organizing groups, group norms, internal functioning of groups, effectiveness of group work, student satisfaction with PBL
6. Johansson et al.	Original research	Quantitative, multiple regression, multilevel growth modeling	Sweden	Primary, secondary, higher education	Secondary data analysis, teacher register	University credits, preservice training, in-service training
7. Pan et al.	Original research	Qualitative and quantitative, systematic literature review (inductive content analysis), expert survey (delphi method)	International	No information, most likely general	Inductive content analysis, expert survey (Delphi method)	Game-based learning, Smart classroom
8. Liu	Original research	Quantitative, fixed-effect modeling	China	No information, most likely general	Secondary data survey, Pupil learning gains	Educational credentials, Pupil learning gains

(Continued)

TABLE 1 (Continued)

Research Topics	Type	Approach	Location	Education level	Method and measure	Focus
9. Gencoglu et al.	Conceptual analysis	Qualitative, theoretical analysis	International	General	Conceptual/theoretical analysis	Student perceptions, variability, teaching quality, individual and cultural factors
10. Falcón-Linares et al.	Original research	Quantitative, correlation, qualitative, grounded theory	Spain	Secondary education	Survey using semi-structured questionnaire	School counselor, school tutoring, vocational guidance, secondary education, qualitative research
11. van de Pers and Helms-Lotenz	Original research	Quantitative, longitudinal, linear regression analysis	Netherlands	Secondary education	Questionnaire survey of teachers	Induction, support, beginning teachers, school context
12. Collie et al.	Original research	Quantitative, CFA, latent profile analyses (single-level and multilevel), multinomial logistic regression analysis	Australia and England	Lower and upper secondary education	Secondary data, Questionnaire survey to school leaders (principals) and teachers and student questionnaire	Job demands-resources theory, teacher wellbeing, latent profile analysis, multilevel, student achievement
13. Kang et al.	Original research	CFA, Structural equation modeling	China	Higher education	Questionnaire survey to students	School psychological capital, validation, academic engagement, achievement emotions, college students
14. Maulana et al.	Original research	Quantitative, CFA, multi-Group CFA (Measurement invariance)	England, Netherlands, the US	Secondary education	External observation by trained observers using an observation protocol	Classroom observation, measurement invariance, effective teaching behavior, 13 secondary education, cross-country comparison

TABLE 2 Specific components of the papers in relation to effective teaching.

Research Topics	Measurements	Antecedents	Correlates	Characteristics	Link with outcomes
1. Yang et al.	✓		✓	✓	✓
2. Li et al.				✓	✓
3. Ouwehand et al.		✓	✓		✓
4. Gomariz et al.	✓		✓		
5. Melguizo-Garín et al.	✓			✓	✓
6. Johansson et al.		✓	✓		
7. Pan et al.				✓	
8. Liu		✓	✓		✓
9. Gencoglu et al.		✓	✓	✓	✓
10. Falcón-Linares et al.			✓	✓	✓
11. van de Pers and Helms-Lotenz		✓		✓	✓
12. Collie et al.	✓	✓	✓	✓	✓
13. Kang et al.	✓		✓		✓
14. Maulana et al.	✓		✓		✓

University students are often assigned to work on group projects as part of their courses. Developing competencies in group work skills is considered a more dynamic learning process closer to social reality, and thus, it is indispensable for their competitiveness in different workplaces and future career development. Using multiple regression, Melguizo-Garin et al. established a positive link between project-based learning (PBL) in university students by measuring competencies related to group work and satisfaction with PBL, suggesting the importance for university teachers to pay attention to the usefulness and planning of group work and forming group norms for a successful implementation of PBL.

Referred to as applying games or related elements, concepts, mechanisms or designs to classroom teaching, Game-based Learning (GBL) has become popular in practice and research when educational games are designed to promote self-regulated learning and enrich the classroom environment. The systematic literature review by Pan et al. is distinctive in its methodology to include an expert survey using the Delphi method, in addition to a comprehensive literature review, to develop a technology-enhanced GBL model which specifies the objectives, learning process, and evaluation of the approach in smart classroom environments.

While student perceptions of teaching quality are widely used as indicators of such quality in practice and research, variability exists in class and across cultures. Gencoglu et al. attempt to provide a conceptual framework to account for individual and cultural variations. By drawing on the relationships between cultural values, student perceptions and social desirability, the authors argue that their conceptual framework may help explain the variability in student perceptions and suggest that enhancing preservice teachers' awareness of value orientations in the classroom should be incorporated into teacher-training.

The paper of Maulana et al. examines the comparability of measuring effective teaching behavior using the International Comparative Analysis of Learning and Teaching (ICALT)

observation instrument, and discusses how observed teaching behavior differs in three educational contexts (Netherlands, England, USA). Categorical multi-group confirmatory factor analysis was used. This study further identifies the need to understand the affordances and limitations of using an effective teaching measure to compare teaching quality across education systems.

2.2. Effective teaching, including factors beyond the classroom processes

Seven articles present studies on effective teaching which include factors beyond the classroom processes. These papers discuss various aspects of effective teaching exclusively, providing rich information about teachers' work that extend beyond instructional and pedagogical role in the classroom.

The paper by Gomariz et al. discusses the creation and validation of a teacher questionnaire called the "Questionnaire on Family Involvement in School, Teacher-Promoter" (QFIS-TP) for measuring teacher facilitation of family participation in Spain, including Early Childhood, Primary, and Secondary Education. They employed exploratory and confirmatory factor analyses as the primary analysis techniques and showed that the psychometric quality of the questionnaire was satisfactory. The study offers an additional tool for studying teachers' roles outside the classroom relating to engaging family involvement in schools.

Assuming some positive relationship between in-service professional teacher development and preservice teacher training is reasonable, but empirical evidence requires extensive data collection. Based on the analysis of national data of language and mathematics teachers in Sweden and multiple regression and multilevel growth modeling, Johansson et al.

showed that teachers with higher credits during teacher training were more likely to engage and perform better in professional development. Their study confirms Shulman's prediction that higher content knowledge contributes to more potent and more persistent development of pedagogical content knowledge.

The bachelor-level educational credentials of teachers are often argued to be indicative of effective teaching and contribute to pupils' learning outcomes. Conducting pupil fixed-effect modeling on the China Educational Panel Survey dataset, Liu provided additional evidence for the significance of teachers studying at degree level for students' learning gain. The effect of the educational credentials of teachers was estimated at about 1 month of additional learning per year. This study highlights the importance of educational credentials of teachers and suggests that learning gains can be improved by educating teachers more appropriately.

The Falcón-Linares et al. paper explores teachers' work in terms of the tutoring practice in Spanish secondary education. A semi-structured questionnaire was used as part of a mixed methods grounded theory approach. The study indicates a relationship between a teacher's profile and tutoring performance.

The authors conclude that, although teachers engage in coordination and supervision roles of tutoring, workloads and lack of clarity regarding tutoring norms create barriers to practicing effective tutoring.

The paper by van de Pers and Helms-Lorenz analyzes the relationship between secondary school background characteristics and beginning teachers' perceptions of induction activities in the Netherlands. Special attention is given to differences between professional development schools (PDS) and non-professional development schools (non-PDS). In a repeated measures design, questionnaires were used to measure perceptions of induction, support and linear regression analysis was performed. The authors found that multiple school locations, school size, the number of beginning teachers employed, and schools with a higher proportion of older male teachers are associated negatively with the frequency of induction activities. This study provides insight into enhancing equity in schools based on induction support perspectives.

Teachers' working conditions are essential for teachers' productive functioning. Investigations of job demands and resources can contribute to our understanding of how support for teachers can be improved. Using the TALIS 2018 data, the paper by Collie et al. investigates teachers' workplace experiences and their links with instructional support and achievement in Australia and England using a person-centered approach based on the job demand-resources model. Latent-profile analysis, multinomial logistic regression, and structural equation modeling were performed. The study reveals six teacher profiles and two school profiles. SES was found to link negatively with unsupportive school profiles. Instructional support and achievement were positively related to supportive school profiles.

Finally, the Kang et al. paper examines the validation of the school psychological capital (PsyCap) and its links with academic engagement and achievement emotions among university students in China. A student questionnaire was used, and structural equation modeling was employed. The paper demonstrates that the PsyCap questionnaire indicates a satisfactory psychometric quality. The authors found that perceived PsyCap resources are related positively to perceived academic engagement and enjoyment but negatively to perceived anxiety and boredom. Their study highlights the importance of school psychological capital resources for positive student outcomes.

3. Concluding thought

This Research Topic demonstrates how important it is to take a closer look at teachers' work with regard to effective teaching within and outside the classroom, considering issues related to measurements, antecedents, correlates, characteristics, and links with outcomes. All the papers included in this Research Topic contribute outstandingly to broadening our understanding of the complex nature of teaching and effectiveness. We thank the authors for their extraordinary contributions. We also thank all of the reviewers, as well as the Frontiers team for assuring the quality of scientific works. We hope that this collection of papers will stimulate international discussion and inspire further work to improve the knowledge base on effective teaching.

Author contributions

Acknowledgments

Conflict of interest

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References

Ko, J., Sammons, P., and Bakkum, L. (2014). *Effective teaching* (Report No. 978-1-909437-75-3). Education Development Trust.

Maulana, R., Helms-Lorenz, M., and Klassen, R. (2023a). *Effective Teaching Around the World: Theoretical, Empirical, Methodological, and Practical Insights.* Dordrecht: Springer.

Maulana, R., Helms-Lorenz, M., Moorer, P., Smale-Jacobse, A., and Feng, X. (2023b). *Differentiated Instruction in Teaching From the International Perspective: Methodological and Empirical Insights.* Groningen: University of Groningen Press. doi: 10.21827/62c554175 9973