

Book of Abstracts

Conference of the EARLI Special Interest Group 18

SIG 18 “Educational Effectiveness and Improvement”

“Diversity and Inclusion as Challenges for Educational Effectiveness and Improvement”

5–7 September 2022, Freiburg, Germany



University of Education Freiburg, Germany

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Keynote I: Prof. Dr. Kim Schildkamp (University of Twente) 1

5 September 2022 10:30 - 11:30

KG 5, 104

Keynote

From Data to Information to.... Students!

Keywords: Data-based decision making and data use, Educational reform, Learning communities, School development and school improvement

Interest group: SIG 18 - Educational Effectiveness and Improvement

How can we increase student achievement in our school? How can we support the well-being of our students? How can we improve the information literacy of our students? Important questions that data can help answer. Data use can lead to school improvement, but it is a long road from data to information to school improvement. In this keynote I will present a data use theory of action. Moreover, I will share the results of more than a decade of research into the data team intervention, a professional development intervention designed to support schools in the use of data. Finally, I will focus on the role of students in the data use process. In most research, students are presented as data sources, for example in the form of student achievement data. In some studies, the role of the students is included in the form of student voice data. However, rarely are students involved in the actual data use process. Yet, involving students in the use of data has a lot of potential, including that this can lead to more effective school improvement strategies. Also, students can develop their own data literacy skills while using data, an important skill for the future.

Poster Session & Coffee 1

5 September 2022 11:30 - 12:30

Mensa, Mezzanine Floor

Poster Presentation

Higher Education, Instructional Design, Learning and Instructional Technology, Learning and Social Interaction, Learning and Special Education, Teaching and Teacher Education

Poster Session

Keywords: Ability grouping and tracking, Achievement, At-risk students, Attitudes and beliefs, Design based research, Diversity education, Effective instruction and teaching, Experimental studies, Heterogeneity, Higher education, Inclusive education, Metacognition, Program implementation and evaluation, Qualitative methods, Secondary education, Social aspects of learning and teaching, Student background, Teaching approaches

Interest group: SIG 18 - Educational Effectiveness and Improvement

Perception of and Coping with Multiple Institutional Discrimination by Young Women at School

Keywords: Diversity education, Qualitative methods, Social aspects of learning and teaching, Student background

Presenting Author: Eva Dalhaus, Martin Luther University Halle-Wittenberg, Germany

Discrimination can manifest itself in forms of structural violence as poverty, sexism and racism to the detriment of women. In the actual research discourse there are clear indications of practices of institutional discrimination against pupils with an ethnic background. It can be assumed, that young women with an ethnic background are particularly affected, because they are exposed to intersectionality due to their social, ethnic and gender characteristics. With reference to habitus and habitus transformation following Bourdieu (1998) the qualitative study aims to use narrative interviews with female teaching students to explore their perception of and coping with practices of multiple institutional discrimination at school. The data will be analyzed on the basis of a constructivist grounded theory (Charmaz, 2014). In a first step, findings on linked practices of classist, ethnic and gender institutional discrimination, which for example amount to "changed evaluation standards", "low attention and refused recognition", and "assumptions of inferiority" will be analyzed. In a second step, forms of perception of and coping with discrimination are presented. Experiences of institutional discrimination can be processed in a negative sense "defensively" (accepting them as unchangeable) or in a positive sense "pragmatically" (coping individually) and "offensively" (actively criticizing and overcoming).

Enhancing Adolescents' Ability to Learn from Errors through Emotional and Metacognitive Teaching

Keywords: Attitudes and beliefs, Design based research, Metacognition, Secondary education

Presenting Author: CRISTINA PASCUA MARTIN, Mondragon University. Faculty of Humanities and Education, Spain; **Co-Author:** Nagore Ipiña Larrañaga, Mondragon University. Faculty of Humanities and Education, Spain; **Co-Author:** Kou Murayama, University of Tübingen Hector Research Institute of Education Sciences and Psychology, Germany

There is little empirical research examining how students can learn most effectively from their own errors. Research typically investigates error-learning processes from either a metacognitive perspective or mindset perspective, but rarely both. To that respect, the present study argues that metacognitive teaching and mindset should be analysed in combination, as multicomponent interventions compared to single-construct interventions are often more effective to bring learning to a large and diverse group of students. As such, the aim of this field experiment is to test the effect of a joint intervention designed to enhance adolescents' ability to learn from their errors at the mathematical complex problem task by simultaneously strengthening their emotion control and metacognitive skills, from the viewpoint of (growth-mindset theory and productive failure). To that end, third year secondary school classes will be assigned randomly to one cell of a 2 x 2 factorial design (Growth mindset intervention vs. control) x (Metacognition intervention vs. control). We hypothesised that the effect of the metacognitive intervention on learning from failure will be improved by supplementing such instruction with additional growth mindset interventions. To finish, we predict a positive impact of the intervention on students' math motivation and academic performance, especially of low-performing students.

Maximise Chances for Struggling Prevocational Students: A Framework of Effective Teaching Principles

Keywords: At-risk students, Effective instruction and teaching, Secondary education, Teaching approaches

Presenting Author: Charlotte Arnou, KU Leuven (BE), Belgium; **Presenting Author:** Heline Van Peteghem, Vrije Universiteit Brussel, Belgium; **Co-Author:** Inge Placklé, Vrije Universiteit Brussel (VUB), Belgium; **Co-Author:** Machteld Vandecandelaere, KU Leuven, Belgium

The increasing complexity and diversity of students in prevocational secondary education creates an exceptionally challenging context for teachers. With the attempt to realize more inclusive education, students with different educational needs and abilities, mostly characterized by ethnically diverse backgrounds and/or low socioeconomic disadvantages, are entering prevocational education. Often, these students do not reach the minimum level of basic literacy, which is crucial to successfully participate and contribute to our complex society and social life. In order to qualitatively educate these vulnerable students, a powerful learning environment (PLE) in prevocational education is crucial. The purpose of this study is to identify decisive teaching principles, that are proven to be

effective in designing PLEs. To this end, we conduct a best fit framework synthesis which is a systematic review method. As we are finalizing this review study in April 2022, the current proposal reports salient features from the first systematic search. This search results in nine identified themes for PLEs: safe and positive learning environment; classroom management; quality of instruction; use and development of 21st century skills; adaptive teaching; challenging learning activities in authentic contexts; pedagogical (content) knowledge; teacher beliefs; and teacher team collaboration.

Effects of Supplemental Instruction on Learning Outcomes: A Randomized Controlled Trial

Keywords: Achievement, Experimental studies, Higher education, Program implementation and evaluation

Presenting Author: Izaak Dekker, Hogeschool van Amsterdam, Netherlands; **Co-Author:** Marie Jose Koerhuis, Applied University of Amsterdam, Netherlands

Higher education mostly moved online during the pandemic. Research shows that this coincided with lower learning gains and well-being. Organizing physical supplemental instruction sessions might recoup some of these losses. Supplemental instruction is a form of structured peer guidance attached to a specific course, provided by an older and trained student to a small group of students (5-15), 100 minutes each week, for the duration of a term. Meta-analyses consistently show a moderate effect of SI on learning outcomes, some studies also tested and found effects on well-being. However, the literature on SI lacks randomized controlled trials and therefore does not adequately address the risk of self-selection bias. In order to estimate more reliably what the effects of SI are, students should be randomly allocated to receive SI or not. The current study tests the effects of SI with a pre-registered, time-lagged, randomized controlled trial. Four hundred first-year students were allocated to receive SI either in the third or in the fourth term. Effects of SI on learning outcomes are measured with course grades. Effects on well-being and belongingness are measured with a survey. Additionally 15 students are interviewed to discover more about the mechanism behind SI.

Supporting the Use of a Dot-array App – Differential Effects on the Acquisition of Operation Sense

Keywords: Achievement, Effective instruction and teaching, Heterogeneity, Qualitative methods

Presenting Author: Eva Schultheis, Institute for Educational Sciences at the University of Education Freiburg, Germany; **Co-Author:** Katharina Loibl, University of Education Freiburg, Germany; **Co-Author:** Timo Leuders, University of Education Freiburg, Germany; **Co-Author:** Marita Eva Friesen, University of Education Freiburg, Germany

Supporting the use of a dot-array app – Differential effects on the acquisition of operation sense

Eva Schultheis, Katharina Loibl, Timo Leuders, Marita Friesen Freiburg University of Education

The ability to translate concrete situations (often represented in word problems) into mathematical models plays a crucial role for further learning. However, studies show that many students have not sufficiently developed this crucial ability – called operation sense – when entering secondary school (here: grade 5). The presented study develops and evaluates an adaptive learning setting for promoting operation sense using animated dot arrays based on assumptions about Aptitude-Treatment-Interaction (ATI)-effects. Since the lack of operation sense often indicates incorrect or incomplete mental representations, the active use of external graphical representations (such as animated dot arrays to facilitate multiplication and division) can support task processing and mental model building. For the translation processes between word problems, graphical and symbolical representations, it can be assumed that students need different types of support depending on their prior knowledge. Accordingly, this study investigates the effects of guiding these translations in a more structured way vs. using open prompts for facilitating translation processes, depending on students' prior knowledge.

Teachers' Individual Frame of Reference and Students' Academic Self-concept in Inclusive Classes

Keywords: Ability grouping and tracking, Attitudes and beliefs, Inclusive education, Social aspects of learning and teaching

Presenting Author: Evangelia Kouka, Institut of Sociology, School of Education, Freiburg, Germany, Germany; **Presenting Author:** Katja Scharenberg, University of Education Freiburg, Germany; **Co-Author:** Sebastian Röhl, University of Education Freiburg, Germany

In students' every-day school interactions, social comparisons with classmates are inevitable and thus influence students' academic self-concept (ASC). According to the Big-Fish-Little-Pond Effect (BFLPE), equally able students have lower ASCs in high-ability schools. Teachers' preference of an individual frame of reference – i.e., when they compare students' prior achievement to their current achievement when assessing performance – could prevent the negative BFLPE. Our study examined how teachers' individual frame of reference affects the BFLPE. Analyses were based on data from a cross-sectional representative study with 821 students in Grades 5–7 attending inclusive classrooms in 20 comprehensive secondary schools in southwestern Germany. Results showed that the classroom average competence level did not significantly affect students' ASC, thus not confirming the BFLPE. However, teachers' individual frame of reference was, as expected, an important predictor of ASC, even when considering students' average competence level. To conclude, our study revealed teachers' individual frame of reference as an efficacious strategy to enhance students' ASC. Furthermore, the fact that the BFLPE was not confirmed with our comprehensive school sample provides insights into possible conditions of a successful inclusive schooling. Regarding students' positive ASC, effective teaching strategies are supposed to sustain alternative grading and individualized feedback.

Session 1 1

5 September 2022 13:30 - 15:00

KG 5, 103

Single Paper

Assessment and Evaluation

Session 1A: Achievement

Keywords: Achievement, Competencies, Cross-national/cultural comparisons / international comparisons, Data-based decision making and data use, Large scale assessment / large scale survey, Primary education, Psychometrics

Interest group: SIG 18 - Educational Effectiveness and Improvement, SIG 23 - Educational Evaluation, Accountability and School Improvement (merged with SIG 18)

Chairperson: Steve Strand, University of Oxford, United Kingdom

English as an Additional Language, Proficiency in English and Educational Achievement in England

Keywords: Achievement, Competencies, Data-based decision making and data use, Large scale assessment / large scale survey

Presenting Author: Steve Strand, University of Oxford, United Kingdom

In England in 2020, one-in-five pupils aged 5-16 are recorded as having English as an Additional Language (EAL). The average achievement of pupils recorded as EAL is sometimes lower than that of monolingual English pupils, but this is not the case for all outcomes or at all ages (Strand et al, 2015). We argue this reflects substantial heterogeneity within the EAL population with respect to their proficiency in English. This paper analyses a nationally representative sample of 140,000 pupils for whom teachers assessed the pupil's proficiency in English (PIE) on a five-point scale (from 'New to English' to 'Fluent'), and reports the association between PIE and achievement in national tests and assessments at age 5, 7, 11 and 16 years. Our results demonstrate that proficiency in English is a significantly better predictor of pupil achievement than EAL status, and that it accounts for up to six times more variance than other student background variables (ethnicity, gender and socio-economic disadvantage) combined. Our findings demonstrate the necessity of assessing proficiency in English to identify learning support needs. We recommend the (re)introduction of proficiency in English ratings to monitor and support student progress and discuss the value of classroom-based language assessments.

Learning Progress in Reading Comprehension from Grade 4 to Grade 6 on the PIRLS-scale in Flanders

Keywords: Achievement, Cross-national/cultural comparisons / international comparisons, Primary education, Psychometrics

Presenting Author: Jonas Dockx, KU LEUVEN, Belgium; **Co-Author:** Koen Aesaert, K.U.Leuven, Belgium; **Co-Author:** Rianne Janssen, KU LEUVEN, Belgium

Flanders (Northern Belgium) had the largest decline in average reading achievement between the Progress in International Literacy Study (PIRLS) 2006 and PIRLS 2016. Therefore, a repeat assessment of PIRLS in 2018 was organized. The purpose was twofold. First, we wanted to assess students' learning gains

between 2016 and 2018 to test whether Flemish students catch up to students in top-performing education systems. Second, we investigated whether reading comprehension in PIRLS 2016 is the same ability that is measured by the Flemish National Assessment in reading. The sample consisted of 4615 students in 126 schools that participated in both PIRLS 2016 and the repeat measurement in 2018. We assessed the students' learning gains during the last two years of primary education and tested the extent to which the items of both sources could be reduced to a unidimensional scale. The results showed that Flemish sixth grade students do not tangibly exceed the average achievement in reading comprehension of top-performing education systems in 4th grade. Furthermore, the results indicate that the items from PIRLS and the National Assessment for Reading can be placed on one underlying measurement scale. In sum, the relevance of the PIRLS 2016 results for Flanders was only strengthened.

The Math Performance Decline in Flanders: A Closer Look from the Grade 6 Math National Assessments

Keywords: Achievement, Large scale assessment / large scale survey, Primary education, Psychometrics

Presenting Author:Mieke Goos, KULeuven + UCLL, Belgium; **Co-Author:**Sascha Spicik, KULeuven, Belgium; **Co-Author:**Jo Denis, KULeuven, Belgium; **Co-Author:**Rianne Janssen, KULeuven, Belgium

In this study, we examine time trends in the math performance of Grade 6 students in Flanders. More specifically, we answer the questions whether the COVID-19 pandemic has strengthened the decline in math performance among Flemish primary school students, and if this is the case, which subgroups of students experienced the steepest decline. Data from three cycles of national Grade 6 math assessments (2009, 2016 and 2021) were used for this purpose (N students = 18524), and analyzed via a series of two-level logistic regression analyses. Results seem to show steeper declines in particular math domains and among specific groups of students. Venues for improvement of math class practice will be discussed.

Session 1 2

5 September 2022 13:30 - 15:00

Mensa, 032

Single Paper

Educational Policy and Systems, Learning and Special Education, Teaching and Teacher Education

Session 1B: Attitudes and Beliefs in Education

Keywords: Attitudes and beliefs, Case studies, Diversity education, Early childhood education, Equity, Heterogeneity, Inclusive education, Qualitative methods, Quasi-experimental research, Teacher education

Interest group: SIG 08 - Motivation and Emotion, SIG 15 - Special Educational Needs, SIG 18 - Educational Effectiveness and Improvement

Chairperson: Sergej Wüthrich, Pädagogische Hochschule Bern, Switzerland

“Prinzip Vielfalt”: Effects of a Diversity Awareness Program on Children’s Inclusive Attitudes

Keywords: Attitudes and beliefs, Diversity education, Inclusive education, Quasi-experimental research

Presenting Author:Sergej Wüthrich, Pädagogische Hochschule Bern, Switzerland; **Presenting Author:**Michelle Lüthi, Pädagogische Hochschule Bern, Switzerland; **Co-Author:**Michael Eckhart, Pädagogische Hochschule Bern, Switzerland; **Co-Author:**Caroline Sahli Lozano, Pädagogische Hochschule Bern, Switzerland

Acknowledgment and valuation of human diversity are important elements in inclusive classrooms. However, students with special education needs, particularly students with learning or behavioral difficulties, are more often rejected and less well accepted than their typically developing peers. Although there is evidence that carefully designed, multicomponent and long-term interventions improve students' attitudes toward and social participation of peers with disabilities, teachers often lack time and resources to implement them. Here, we assessed the impact of low-threshold and easy-to-implement teaching units (“Prinzip Vielfalt”) covering the topic of diversity on students' willingness to interact with peers with disabilities. 51 elementary school classes took part in a cluster-controlled study (experimental group: 34 classes, n = 688 students; waiting-control group: 17 classes, n = 345 students), where teachers in the experimental group implemented a standardized 6-week program (12 lessons) on the topic “diversity”. Results from pre-post multilevel regression analyses revealed no significant long-term effect of the intervention on students perceived social norms, self-efficacy, or intentions to interact with peers with learning or behavioral disabilities. However, attitudes toward both peer groups improved significantly, and a subsequent mediation analysis revealed an indirect mediation effect of attitudes on students' inclusive intentions.

Parents’ Attitudes and Unequal Opportunities in Early Childhood Development in India

Keywords: Attitudes and beliefs, Case studies, Early childhood education, Equity

Presenting Author:Saikat Ghosh, Leibniz Institute for Educational Trajectories, Germany

Early childhood development is considered a crucial component for sustainable development, and parents' roles in this regard is unambiguously acknowledged. However, the evidence is sparsely available from developing countries like India on how parents can influence access to the early childhood development program. This study, based on an empirical footing, investigates whether parental attitude may lead to unequal opportunities in children's access to preschools in India. The study portrays that the negative or indifferent attitude of parents predicts significantly lower access to preschools. Also, parents' education can be held responsible for the variation in parents' attitudes toward early education and care. A two-prong policy measure is thus suggested by educating parents on one hand and involving them in the implementation process of childhood development programs on the other.

How Biology and Religious Education Teachers Diagnose Student Attitudes on Creation and Evolution

Keywords: Attitudes and beliefs, Heterogeneity, Qualitative methods, Teacher education

Presenting Author:Tobias Hoppe, Pädagogische Hochschule Freiburg, Germany; **Co-Author:**Christiane Konnemann, Westfälische Wilhelms-Universität Münster, Germany; **Co-Author:**Christian Höger, Universität Luzern, Switzerland; **Co-Author:**Alexander Renkl, Albert-Ludwigs-Universität Freiburg, Germany; **Co-Author:**Werner Rieß, Pädagogische Hochschule Freiburg, Germany

Accurate judgments of students' attitudes concerning creation and evolution are a necessary condition for individual support in both biology and religious education classrooms. While some studies have assessed the attitudes of students and teachers, little is known about how teachers themselves arrive at appropriate judgments of students' attitudes. This study aims to elucidate the diagnostic judgment processes of noticing and interpreting related to learners' attitudes concerning creation and evolution. In doing so, we want to capture the influence of person characteristics of the judging (prospective) biology and RE teachers on diagnostic performance. The results contribute to the design of learning environments in which teachers' diagnostic skills can be effectively fostered.

Session 1 3

5 September 2022 13:30 - 15:00

Mensa, -202

Single Paper

Motivational, Social and Affective Processes, Teaching and Teacher Education

Session 1C: Teaching Quality and Student Achievement

Keywords: Achievement, At-risk students, Effective instruction and teaching, Effectiveness and efficiency, Motivation, Primary education, Quantitative methods, Teacher professional development

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Antonis Dervenis, KU LEUVEN, Belgium

Making Connections between Teaching Quality and Student Achievement in Taiwan

Keywords: Achievement, Effective instruction and teaching, Effectiveness and efficiency, Teacher professional development

Presenting Author: Po Tsai, University of Cambridge, United Kingdom

Over the past few decades, there has been a growing focus on the importance of promoting quality of teaching and improving student outcomes in primary schools. Numerous studies of teacher effectiveness have indicated that student achievement gains are related to quality of teaching (Kyriakides et al., 2020; Muijs & Reynolds, 2011; Nye et al., 2004). Despite the acknowledged importance of quality of teaching, we still don't know much about the association between teaching skills and student outcomes. Working from this perspective, this study aims to investigate whether we could identify stages of quality of teaching, and the association of those stages with student achievement. The results of the study reveal that teaching skills can be grouped into three types of teacher behaviour, and stages of quality of teaching are not significantly related to student achievement. The findings of my study identified contextual differences specific to the Taiwanese educational system when identifying stages of quality of teaching and its relationship with student achievement. The accumulation of globalised studies from various countries is conducive to enriching discussion in relevant academic fields.

Teachers' Instructional Behavior and Student Background Characteristics: A Systematic Review

Keywords: Achievement, At-risk students, Effective instruction and teaching, Primary education

Presenting Author: Antonis Dervenis, KU LEUVEN, Belgium

This systematic review synthesizes the results of recent empirical studies on the differential effects of teachers' instructional behavior on students' achievement. Instructional behavior is operationalized according to the eight teacher factors of the Dynamic Model of Educational Effectiveness, i.e., orientation, structuring, questioning techniques, the classroom as a learning environment, teaching modelling, application, time management and assessment. The outcomes under investigation are reading, math and science achievement in primary school. Differential effects are examined according to the students' gender, home language, socioeconomic status and ethnicity. In total, 45 studies were selected and reviewed. The results indicate that especially students who are considered to be at-risk of academic failure due to their background characteristics (e.g., not speaking the language of instruction at home) benefit more from teacher-driven teaching modelling and certain application tasks. These pupils also gain more from a positive relationship with their teacher compared to their low-risk peers. However, certain factors, such as orientation and structuring, remain underexplored.

The Relation of Perceived Teaching Quality to Student Outcomes: The Mediation of Learning Activities

Keywords: Achievement, Effective instruction and teaching, Motivation, Quantitative methods

Presenting Author: Ayşenur Alp Christ, Institute of Education, University of Zurich, Switzerland; **Co-Author:** Vanda Capon-Sieber, Institute of Education, University of Zurich, Switzerland; **Co-Author:** Carmen Köhler, DIPF | Leibniz Institute for Research and Information in Education, Germany, Germany; **Co-Author:** Eckhard Klieme, German Institute for International Educational Research (DIPF), Germany; **Co-Author:** Anna-Katharina Praetorius, Institut für Erziehungswissenschaft, Switzerland

One prominent model of teaching quality in German-speaking countries, the model of the three basic dimensions (TBD), assumes that depth-of-processing mediates the effect of cognitive activation and classroom management on achievement, time-on-task mediates the effect of classroom management on achievement, and need satisfaction mediates the effect of classroom management and student support on motivation. These central assumptions, however, were rarely investigated. Furthermore, considering other theories on motivation and effort, more mediating paths could exist. This cross-sectional study investigated the mediating role of depth-of-processing, time-on-task, and need satisfaction between student-rated teaching quality and students' mathematics achievement and interest. We used data from the TALIS Video Study Germany, which comprised 958 secondary school students ($M_{age} = 14.82$, $SD = 0.62$; 51% females). Path analyses showed that confirming the TBD model, depth-of-processing mediated between cognitive activation and achievement, and need satisfaction mediated between student support and interest. Different from the TBD model, depth-of-processing also mediated between cognitive activation and interest, and between student support and both outcomes. Need satisfaction additionally mediated between student support and achievement; time-on-task mediated between classroom management and interest. Our results showed that TBD model is partly confirmed by our analyses and new patterns emerged.

Session 1 4

5 September 2022 13:30 - 15:00

KG 5, 104

Symposium

Educational Policy and Systems, Teaching and Teacher Education

Changes in School and Teaching Cultures over the Last 40 Years

Keywords: Comparative studies, Educational reform, Effective instruction and teaching, Large scale assessment / large scale survey, Longitudinal analyses/research, Secondary data analysis

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Tobias Feldhoff, Johannes Gutenberg University of Mainz, Germany

Chairperson: Eckhard Klieme, German Institute for International Educational Research (DIPF), Germany

Discussant: Falk Radisch, Germany

It is often assumed that the school cultures have changed in Germany since the late 1960s. However, our historical and empirical knowledge about the stability or changes of schools, their culture, and the specific teaching practices over the last 50 years is very limited. During our symposium, we would like to present first indications of a possible long-term change of school cultures. The first contribution will provide an overview of a planned mixed-methods project on change of school cultures. The starting point is Fend's three-state study, which was conducted at 61 schools in Hesse and North Rhine-Westphalia in 1978 and in Lower Saxony in 1979. Contributions 2 and 3 illustrating the potential of the planned study by presenting initial findings on the change of school cultures after the assessment of two selected questions based on DLS, and a preliminary study at 10 schools in Hesse and Rhineland-Palatinate in 2017. The second contribution looks at the change of school cultures through the evaluation of stability or change of constructs using measurement variance analyses. The third contribution looks at the stability or change of teaching cultures through the evaluation of teaching profiles using latent-class analyses. The contributions will then be critically discussed.

The project "School cultures in change"

Presenting Author: Tobias Feldhoff, Johannes Gutenberg University of Mainz, Germany; **Co-Author:** Eckhard Klieme, German Institute for International Educational Research (DIPF), Germany; **Co-Author:** Sabine Reh, DIPF | Leibniz Institute for Research and Information in Education, Germany

School is considered to be the institution that serves the socialization and systematic qualification of future generations for a life in society. Due to the "Grammar of schooling" (Tyack & Tobin, 1993), its fundamental structures seem to be very stable. Yet, social changes that have taken place in Germany in recent decades have led to many new demands on schools. Changes in the culture of schooling and teaching, above all at the level of professional practice, can hardly be traced for lack of data for the last decades. Many (different) hypotheses have been set up, but hardly any empirically validated knowledge is available on this matter. This paper provides an overview of a planned mixed-methods project on school cultures in change. Besides the theoretical background of the study, the research questions and the design and framework model of the study are presented. The paper contextualizes the two following empirical contributions.

Measurement invariance analyses for the investigation of changes in school culture over 40 years

Presenting Author: Sebastian Wurster, Ludwig-Maximilians-Universität München, Germany; **Co-Author:** Tobias Feldhoff, Johannes Gutenberg University of Mainz, Germany

Many hypotheses have been set up about stability and change of the culture in schools and teaching. The analysis of changes over time requires knowledge of the constructs measured. Measurement invariance analyses are necessary for the investigation of changes in school and teaching cultures in two ways. Firstly,

they are a prerequisite for further analyses (e.g. group differences, interrelationships). Secondly, they offer information through possible changes in the understanding of constructs. Based on Fend's (1982) 'Three-state study' („Drei-Länder-Studie") (N = 61 schools, N = 1169 teachers) in 1978/79 and based on a (preliminary) study (N = 10 schools, N = 305 teachers) in 2017, measurement invariance over a period of nearly 40 years of several constructs of school and teaching culture were analyzed. The results of multi-group confirmatory factor analyses for the analysis of measurement invariance show that the majority of the constructs of teaching culture have scalar measurement invariance and the majority of the constructs of school culture have metric measurement invariance. The results of the alignment method for approximate measurement invariance indicates, in most cases, scalar measurement invariance or approximate scalar invariance. The results indicate the possibility to conduct further analyses.

Profiles of teaching culture and their relation to student outcomes over time.

Presenting Author:Brigitte Steinert, Leibniz Institute for Research and Information in Education (DIPF), Germany; **Co-Author:**Julia Dohrmann, Goethe-University Frankfurt, Germany; **Co-Author:**Eckhard Klieme, German Institute for International Educational Research (DIPF), Germany; **Co-Author:**Christine Schmid, Free University of Berlin, Germany

Little is known about the stability and change of characteristics of school and teaching culture, empirical studies on this question or studies with a long-term perspective are hardly available (exceptions: Fend & Berger, 2016; and the PISA studies since 2000). In order to answer this question, data from the "Drei-Länder-Studie" (DLS) by Fend from 1978/79 and the pilot study for the planned follow-up study by DLS from 2017 will be used. In a first step, it will be examined to what extent school classes with typical combinations of central teaching characteristics (support, structuring, effective use of time) can be identified in the respective studies and how these profiles look in a time comparison. The second step is to analyse the relationships between the profiles and the students' achievement in English and socio-emotional outcomes such as well-being in English lessons. Changes in the profiles as well as in the correlations with learning outcomes can provide indications of changed practices in school and teaching. The extent to which the similarities and differences found provide indications of stability or change in school cultures will also be discussed.

Session 2 1

5 September 2022 15:30 - 17:00

Mensa, 032

Single Paper

Learning and Special Education

Session 2A: Peer Relations and Social Outcomes

Keywords: Class and school composition, Collaborative learning, Inclusive education, Primary education, Program implementation and evaluation, Quasi-experimental research, Social interaction, Social participation

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Marij Veldman, University of Groningen, Netherlands

Changes in Patterns of Peer Relationships in Classroom Networks Through Cooperative Learning

Keywords: Collaborative learning, Primary education, Program implementation and evaluation, Quasi-experimental research

Presenting Author:Marij Veldman, University of Groningen, Netherlands; **Co-Author:**Simone Doolaard, University of Groningen, Netherlands; **Co-Author:**Roel J. Bosker, Rijksuniversiteit Groningen, Dept of Education and GION, Netherlands; **Co-Author:**Tom Sniijders, University of Groningen, Netherlands

We studied the impact of cooperative learning on positive peer relationships, i.e., liking to work together, in classroom networks. Cooperative learning was implemented on a daily basis as part of the Success for All program. Longitudinal social network analysis was used to investigate the development of structures and patterns of relationships in 16 intervention and 16 control classrooms, totally including 791 students. Results showed a significant greater openness of the networks in intervention classrooms, that is less tendency toward the formation of small clusters or cliques. We did not find a higher number of positive peer relationships or greater diversity in peer relationships, i.e., a weaker tendency to choose similar classmates with regard to gender, socio-economic status, and academic performance.

How Social Similarities Structure Peer Relations in Inclusive Settings

Keywords: Class and school composition, Inclusive education, Social interaction, Social participation

Presenting Author:Hannah Decker, University of Education Freiburg, Germany; **Presenting Author:**Katja Scharenberg, University of Education Freiburg, Germany; **Co-Author:**Sebastian Röhl, University of Education Freiburg, Germany; **Co-Author:**Wolfram Rollett, University of Education Freiburg, Germany

Although inclusive classrooms offer favourable structures for the development of heterogeneous social relationships (Avramidis, 2010), previous research indicated that individual friendship networks are often structured by social categories and that students tend to choose peers with similar characteristics or sociocultural backgrounds as friends (McPherson et al., 2001). This phenomenon – the tendency towards homogeneity in social relationships – is known as *homophily* (Lazarsfeld & Merton, 1954). As a consequence, individual characteristics such as gender (McCormick et al., 2014), migration background (Krawinkel et al., 2018) or special educational needs (SEN; Schwab, 2019) might influence social networks in classrooms and subsequently co-determine social participation. Using social network data from students ($n=821$) in inclusive classrooms, our study examined the extent to which students prefer friendships with peers who share similar characteristics to themselves, using gender, migration background and SEN as grouping attributes. The focus of our study was to investigate the tendency to form group-internal friendships of students with and without SEN in inclusive classrooms and to classify corresponding preferences in comparison to gender- or origin-related effects. Furthermore, we analysed differences in the extent of homophily tendencies between different classrooms, as social relationships between children might also depend on classroom characteristics (Eckhart, 2005; Schwab, 2016).

Session 2 2

5 September 2022 15:30 - 17:00

Mensa, -202

Single Paper

Educational Policy and Systems, Higher Education, Learning and Instructional Technology

Session 2B: Digital Learning

Keywords: Achievement, Class and school composition, Cross-national/cultural comparisons / international comparisons, Culture, Diversity education, Effectiveness and efficiency, Equity, Evaluation, Higher education, Improvement, Quantitative methods, Secondary data analysis

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Beatriz Gallo Cordoba, Monash University, Clayton Campus, Australia

Ethnic Achievement Gaps and Digital Exclusion: Evidence from Colombia

Keywords: Achievement, Class and school composition, Equity, Secondary data analysis

Presenting Author:Beatriz Gallo Cordoba, Monash University, Clayton Campus, Australia

Despite persistent evidence of ethnic achievement gaps around the world and growing interest in the role of digital exclusion in academic achievement, little is known about the link between digital exclusion and ethnic achievement gaps. This paper aims to contribute to filling this gap using Colombia's national assessment data for 11th grade (age 15/16) students. Understanding that ethnic achievement gaps are the result of a combination of student, school and local-authority processes, the focus is on the within-school achievement gaps and the contextual effects of ethnicity. Students belonging to an ethnic minority group in Colombia have lower maths scores and are more likely to be digitally excluded. The school proportion of students with small-screen access to ICT is linked to a

stronger school contextual effect of Afrocolombian students, but a weaker contextual effect of Indigenous students. This evidence is a call for different ICT access programs to not only consider their consequences for academic achievement, but also for their implications for equity.

Voluntary E-learning Exercises Support Students in Mastering Statistics

Keywords: Effectiveness and efficiency, Evaluation, Higher education, Improvement

Presenting Author: Jakob Schwerter, Institute for School Development Research (IFS), TU Dortmund, Germany; **Co-Author:** Taiga Brahm, University of Tübingen, Germany

University students often learn statistics in large classes, and in such learning environments, students face the high risk of failure. One reason for this is students' statistics anxiety. This paper shows how students can avoid failure and be supported using e-learning exercises with automated knowledge of correct response feedback supplementing a face-to-face lecture. We surveyed 67 undergraduate sociology students at a German university and observed their weekly e-learning exercises. We aggregated students' exercise behaviour throughout the semester to explain exam performance at the end. To control for participation bias, we included important predictors of educational success, such as prior achievement, motivation, personality traits, time preferences, and goals. We applied a double selection procedure to include an optimal but sparse set of control variables. The e-learning exercises indirectly promoted the self-regulated learning techniques, self-testing and spacing. Working on the e-learning exercises increased students' performance on the final exam, even after controlling for the rich set of control variables. Two thirds of students used our designed e-learning exercises; however, only a fraction of students spaced out the exercises, although those students who completed the exercises during the semester and were not cramming at the end benefited additionally.

Effective ICT Uses on Mathematics Achievement for Immigrants in Western and Chinese Countries

Keywords: Cross-national/cultural comparisons / international comparisons, Culture, Diversity education, Quantitative methods

Presenting Author: Mei-Shiu Chiu, National Chengchi University, Taiwan; **Co-Author:** Christin Laschke, Leibniz-Institute for Science Education (IPN), Germany

This study aims to identify effective ICT uses on mathematics achievement (MAch) for students of different immigrant backgrounds, with a partial concern on gender and socioeconomic status (SES) between Western and Chinese countries. This study is developed on the basis of the ecological techno-process (ETP) model. Data from the Program for International Student Assessment (PISA) 2015 were used. Among the 73 participating countries, 30 countries have a negative relationship between immigrant status and SES, 22 non-significant, 17 positive. Nine countries of the first three categories were selected. Regression analysis revealed that a common result among the nine selected countries is that SES and males positively predict MAch. Differences in the predictive capability of ICT use for MAch occur between countries, cultures, and immigrant backgrounds. For natives, outside-school ICT use for homework negatively predicts MAch for Western countries but positively for Chinese countries. For immigrants, homework ICT use generally remains a positive predictor for Chinese countries, but Western countries have more diversities. For example, homework ICT use is a positive predictor for immigrants' MAch in the UK. For immigrants in Germany, ICT use for social interaction predicts MAch positively. The empirical evidence mostly supports the ETP model.

Session 2 3

5 September 2022 15:30 - 17:00

KG 5, 103

Single Paper

Assessment and Evaluation, Higher Education

Session 2C: Effects of Teaching and Teachers

Keywords: Culture, Diversity education, Dropout, Effectiveness and efficiency, Evaluation, Meta-analysis, School development and school improvement

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Maria Anastasou, University of Cyprus, Cyprus

A Synthesis of Teacher and School Improvement Studies Searching for Effects on Learning Outcomes

Keywords: Effectiveness and efficiency, Evaluation, Meta-analysis, School development and school improvement

Presenting Author: Maria Anastasou, University of Cyprus, Cyprus; **Co-Author:** Leonidas Kyriakides, University of Cyprus, Cyprus; **Co-Author:** Tryfonas Papadamou, University of Cyprus, Cyprus; **Co-Author:** Elena Kokkinou, University of Cyprus, Cyprus

This paper provides a critical review of studies searching for ways to improve teacher and school effectiveness in an attempt to compare the effect of different improvement approaches including the dynamic approach (DA) to teacher and school improvement. Specifically, the methods and main findings of a synthesis of improvement studies conducted from 2005 until 2017 are presented. By comparing the findings of this synthesis with the findings of experimental studies investigating the impact of the DA on student learning outcomes, we demonstrate the important role of the Advisory and Research Team in designing and implementing teacher and school improvement projects. We also stress the relationship between theory, research and educational practice that needs to be established in order to promote quality and equity in education. Finally, implications for research on teacher and school improvement are drawn.

Student Habitus and Cultural Fit - A Challenge for School Development

Keywords: Culture, Diversity education, Dropout, School development and school improvement

Presenting Author: Robert Pham Xuan, ILS - Institut für LehrerInnenbildung und Schulforschung (Institute for teacher education and educational research), Austria

This article addresses a problem which seems inherent to educational science. In concrete terms, it is about the question of how to explain the emergence and reproduction of educational inequality. A frequently used theoretical model, especially in quantitative educational research, is the so-called primary and secondary effects of origin. With this model, the decisions of families on school transition in particular have become the focus of research interest. At the center of this approach, human action is assumed to be rational and conscious. The consequence of such a conception is that the responsibility for the persistence of educational inequality is passed on to the families themselves. This article will discuss the question of whether Bourdieu's sociology can be used to adopt a perspective in which educational inequality can be understood as the result of relations in social power. The focus will be on the habitus concept, and it will be shown that there is a cultural fit between the primary habitus (habitual dispositions from the primary socialisation of the child) and a secondary habitus (demands and normality expectations of the institution). For this purpose, results of the study: "Reconstructions of Student Habitus" will be presented.

Session 2 4

5 September 2022 15:30 - 17:00

KG 5, 104

Symposium

Diversity and Inclusion as Opportunities for Educational Effectiveness and Improvement in US Schools

Keywords: Diversity education, Effectiveness and efficiency, Equity, Large scale assessment / large scale survey, Quantitative methods

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Heather Price, United States

Discussant: Heather Price, United States

North American schools have a long history of fluctuating school demographics, with immigration, language, and cultural diversity part-and-parcel to its identity. Segregated learning opportunities follows this long history in the Americas. Relatively new are the laws protecting students from discrimination in access to equal schooling. This invited symposium brings together researchers from the Americas to discuss how the structure of school practices function under these laws as well as how segregated and discriminatory learning still exists in the fabric of schooling despite advances in the laws. Presenters will discuss special

education needs, language accommodations, gifted/talented services, and discipline disparities across student subgroups identified by racial, ethnic, immigration, sexual orientation, and socioeconomic backgrounds. Each presentation presents the state of inequality present in the larger context, identifies school structures and practices to reduce inequality, and works under the theoretical premise that diversity in schools provides opportunities to enhance the schooling experience for all students, teachers, and families. In addition to the academic benefits to practicing inclusivity in schools, these papers assume there to be a social justice good embedded in these practices.

Local Migration Contexts and Latino Children's Access to Educational Resources

Presenting Author:Jacob Hibel, University of California, Davis, United States

The first paper by Professor Jacob Hibel and colleagues at University of California at Davis focuses on recent increases in the school-age Latino population and how these trends coincide with Latino families' increasing geographic dispersion across the United States. These demographic trends injected new diversity into communities and schools that have little experience accommodating Latino youth. As primary institutional engines of socialization and stratification, schools forefront the processes determining the prospects of the next U.S. Latino generation. This study emphasizes the importance of historical, social-geographic, and bureaucratic contexts in structuring Latino children's access to educational supports of special education for students with disabilities, English Language acquisition supports for English Learners, and gifted/talented education services for high-achieving students. We demonstrate Latino children's exposure to coethnic classroom teachers is particularly influential and manipulable institution-level variable that to potentially mitigate unequal educational resource allocation in new Latino destination schools.

Remedying the School to Prison Pipeline: Lessons from successful US districts

Presenting Author:Mariella Arredondo, Indiana University, United States

The second paper by Dr. Mariella Arredondo at Indiana University at Bloomington investigates the disciplinary disparities in schooling for students. The "school to prison pipeline" describes how school exclusion, suspensions, and expulsions, can begin a process putting students at increased risk for negative outcomes, including lost opportunities for learning, academic disengagement, low achievement, truancy, drop out, and even incarceration. Exclusionary disciplinary school practices and policies fall disproportionately on African American males, but also extend to students with disabilities, African American females, and LGBTQ students. School conditions for learning and a culturally relevant school climate can reduce disparities. When students' identities and cultures reflect back to them, they feel safer, report less victimization and discrimination, feel more connected to school, and report higher achievement. Three school districts exemplify how to reduce reliance on school suspension and expulsion to manage student behavior, with special attention to reducing racial/ethnic disparities and increase achievement.

Shadow schools: How segregated learning opportunities persist in American districts

Presenting Author:Heather Price, Loyola University Chicago, United States

The third paper by Dr. Heather Price at Loyola University Chicago looks at how disparity in enrollment in "college prep" courses, identified as Advanced Placement or International Baccalaureate courses, occur along racial and ethnic lines in the US. While some districts' disparity occurs by hoarding resources onto a single college prep specialty school or limiting student access to these courses within schools, this presentation makes known one covert structure that reinforces this disparity that only appears to impact African American students: the structure of "no CP" schools within districts with CP curricula. This presentation advances the premise that 21st century stratified learning continues to unequally distribute the public good of curriculum to some students and not to other students who occupy the same space in a district using *de facto* segregation. These results reverberate 20th century tracking under the new auspice of "AP" and "IB" in place of "honors" tracked classes.

Session 3 1

6 September 2022 09:30 - 11:00

Mensa, -202

Single Paper

Assessment and Evaluation

Session 3A: Learning and Educational Inequalities in Times of the Pandemic

Keywords: Cognitive skills and development, Early childhood education, Effectiveness and efficiency, Equity, Longitudinal analyses/research, Primary education, Quantitative methods, School development and school improvement, Self-efficacy, Teacher professional development

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Francesca Suter, Switzerland

Effects of Pre-pandemic School Improvement and Digital Learning on Schools in the COVID-19 Pandemic

Keywords: Longitudinal analyses/research, School development and school improvement, Self-efficacy, Teacher professional development

Presenting Author:Francesca Suter, University of Teacher Education of the Grisons, PHGR, Switzerland; **Co-Author:**Katharina Maag Merki, University of Zurich, Switzerland; **Co-Author:**Tobias Feldhoff, Johannes Gutenberg University of Mainz, Germany; **Co-Author:**Tanja Rettinger, Johannes Gutenberg University of Mainz, Germany

The COVID-19 pandemic has affected the core of schooling and teaching and presented schools with new challenges. Previous research has suggested that school improvement (SI) capacity is positively associated with successfully dealing with unexpected and disruptive challenges. However, further study is required to understand the impact of the long-lasting situation of a pandemic. The aim of our study was to investigate *how pre-pandemic experiences in SI and digital learning (DL) are related to A) schools' strategies to deal with the COVID-19 pandemic and B) professionalisation*. For the study, N = 280 school principals from Germany, Austria and five German-speaking Swiss cantons participated in two online questionnaires in autumn 2020 and summer 2021. Results from the structural equation model showed that pre-pandemic experiences in SI and DL positively related to the application of strategies. The applied strategies, in turn, had a positive effect on professionalisation. The results highlighted the importance of building SI capacity and supporting schools in DL (e.g., by providing digital resources or teacher training) to help schools face future challenges.

Learning Loss and Learning Inequality in Low-Income Area During the Pandemic

Keywords: Early childhood education, Effectiveness and efficiency, Equity, Longitudinal analyses/research

Presenting Author:Tiago Bartholo, Federal University of Rio de Janeiro, Brazil; **Co-Author:**Mariane Campelo Koslinski, Federal University of Rio de Janeiro, Brazil; **Co-Author:**Daniel Lopes de Castro, Federal University of Rio de Janeiro, Brazil; **Co-Author:**Felipe Macedo de Andrade, Federal University of Rio de Janeiro, Brazil

This paper presents the results of a longitudinal study using data from a city in the Northeast of Brazil. The research design compares the progress of three cohorts of pupils at ages 5/6 who attended the second year of preschool (compulsory education in Brazil) in 2019, 2020 and 2021. Value-added models were used to estimate the impact of school closure in the short (2020) and mid-term (2020-2021) in language and mathematics development. The study presents a probabilistic sample and randomly selected classrooms and children in all schools in one particular city. Eight hundred ninety-five children were assessed using an adaptation to the Performance Indicator for Primary Schools at the start and end of the school year. Results suggest a learning loss of 0.73 and 0.56 standard deviations for language and mathematics, respectively, during 2020. The analysis for the 2021 cohort (experienced school closure for one year and a half): 1.08 and 1.05 standard deviations for language and mathematics, respectively. The results indicate that children from a lower socioeconomic status learned only 26% and 35% in language and mathematics; on the other hand, children from a higher socioeconomic level learned approximately 53% in language and 62% in math.

Development of Primary School Children's Cognitive Abilities in Times of the COVID-19 Pandemic

Keywords: Cognitive skills and development, Longitudinal analyses/research, Primary education, Quantitative methods

Presenting Author:Wolfram Rollett, University of Education Freiburg, Germany; **Co-Author:**Thomas Leitgeb, University of Education Burgenland, Austria; **Co-Author:**Katja Scharenberg, University of Education Freiburg, Germany

In current empirical educational research, one important question is how the societal measures taken to contain the COVID-19 pandemic affected students' cognitive development and whether disadvantaged students suffered particular disadvantages in their cognitive development depending on their individual characteristics or family background. In the present study, we assessed basic cognitive abilities (inductive reasoning, numerical thinking) of elementary school students ($n=104$) in Austria in the 2020/21 school year before and after measures to contain the second and third pandemic waves (e.g., contact restrictions, school closures, distance learning). The findings indicate that, on average, children did not develop as positively over the nine-months study period characterised by pandemic containment measures as would have been expected. Students with parents with a higher educational background and whose families were better equipped with digital devices or internet access cognitively developed more favourably over the course of the school year with regard to inductive reasoning and numerical thinking. Beyond this, our results indicate cognitive losses among disadvantaged groups.

Session 3 2

6 September 2022 09:30 - 11:00

KG 5, 103

Single Paper

Lifelong Learning, Motivational, Social and Affective Processes

Session 3B: Immigrant Background

Keywords: Attitudes and beliefs, Competencies, Cross-national/cultural comparisons / international comparisons, Equity, Primary education, Secondary education, Student background

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: David Glauser, University of Bern, Switzerland

Effects of School Segregation on Educational Achievement Along the Educational Trajectory in Germany

Keywords: Competencies, Equity, Primary education, Secondary education

Presenting Author:Robin Benz, University of Bern, Switzerland; **Co-Author:**Simon Seiler, Universität Bern, Interfaculty Centre for Educational Research, Switzerland; **Co-Author:**Andrea B. Erzinger, Universität Bern, Interfaculty Centre for Educational Research, Switzerland

This study aims to analyse how socioeconomically and ethnically segregated classroom compositions affect the short-term and mid-term development of educational achievement in Germany. Drawing on data from the German National Educational Panel Study, it does so by focusing on different educational stages and transitions throughout learners' educational trajectories. We employ a hierarchical linear modelling approach, considering both clustering at the classroom level and effect heterogeneity across classrooms. Preliminary results suggest heterogeneous effects of classroom composition on the formation of competencies in reading and mathematics, potentially re-enforcing the individual disadvantages of lower-class students and students with a migration background. From kindergarten to secondary education, sequential experiences of socioeconomic and ethnic segregation likely trigger a cycle of cumulative (dis)advantage, affecting children's learning development.

Consequences of Ethnic School Segregation on Educational Attainment at Upper Secondary Level

Keywords: Attitudes and beliefs, Cross-national/cultural comparisons / international comparisons, Secondary education, Student background

Presenting Author:David Glauser, University of Bern, Switzerland; **Co-Author:**Robin Busse, Georg-August-University, Göttingen, Germany; **Co-Author:**Katja Scharenberg, University of Education Freiburg, Germany

The aim of the presentation is to examine whether and how ethnic segregation at lower secondary level is associated with inequalities at the trajectory to upper secondary level in Germany and German-speaking Switzerland. The focus is on inequalities regarding a direct transition to certifying upper secondary tracks (vocational or academic) as well as on the propensity to attend an academic track instead of vocational education and training (VET) one year after leaving compulsory education. Overall, the results point to substantial ethnic and social segregation at lower secondary level in both countries. This segregation is linked to educational disadvantages for specific migration groups and the offspring from economically less privileged families, which translates into inequalities at subsequent educational levels. The previously attended school track matters with regard to directly commencing a certifying upper secondary track as well as with regard to attending an academic track. However, our analyses, which we conducted separately by school track at lower secondary level, do not indicate that ethnic or social segregation at class level is associated with educational disadvantages, nor do we observe disadvantages for specific ethnic groups. Finally, the findings indicate that social segregation seem to matter more than segregation related to migration background.

Session 3 3

6 September 2022 09:30 - 11:00

Mensa, 032

Single Paper

Assessment and Evaluation

Session 3C: Accountability and School Inspection

Keywords: Accountability and school inspections, Educational attainment, Effectiveness and efficiency, Large scale assessment / large scale survey, Quantitative methods, School development and school improvement

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: George Leckie, University of Bristol, United Kingdom

School Value-added Models for Academic and Non-academic Outcomes in School Accountability Systems

Keywords: Accountability and school inspections, Educational attainment, Effectiveness and efficiency, Quantitative methods

Presenting Author:George Leckie, University of Bristol, United Kingdom; **Co-Author:**Lucy Prior, University of Bristol, United Kingdom

Education systems around the world increasingly rely on school value-added models to monitor school performance and hold schools to account. These models typically focus on a limited number of academic outcomes. We explore how the traditional multilevel modelling approach to school value-added models can be extended to simultaneously analyse multiple academic and non-academic outcomes and the implications of doing so for systems using student data to monitor schools and inform school accountability. We jointly model student attainment, absence and exclusion data for schools in England. We find very different results across the three outcomes, in terms of the size and consistency of school effects, and the importance of adjusting for student characteristics. The results suggest the three outcomes are capturing fundamentally distinct aspects of school performance, all of which are therefore important for education systems to monitor and explore including in systems of school accountability.

School Board Effects: The Measure and Stability of Four Performance Indicators

Keywords: Accountability and school inspections, Effectiveness and efficiency, Large scale assessment / large scale survey, School development and school improvement

Presenting Author:Marinda Spithoff, University of Groningen / GION, Netherlands

Pupils' educational achievement is partly attributable to the schools they attend. School effects seem rather stable on short term, yet become more instable when more time passes or when researchers control for students' characteristics and/or prior achievement. Since the 1990s, schools in the Netherlands have

increasingly joined into large school boards. The creation of larger school boards created an additional level that potentially influences pupils' educational achievement. The Dutch Inspectorate of Education assesses effects of secondary schools on four performance indicators. By adding school boards as an additional hierarchical level to the analyses of performance indicators, one can measure the added value of school boards. This provides a more complete view of how pupils' learning performance is established and which organizational units contribute to this. Multi-level analysis, based on population level data from the Dutch Inspectorate of Education, showed that school boards account for a small portion of the variance on three out of four indicators; the analysis also shows that there is a certain stability in time in the school board effects on all the performance indicators. This study shows that it matters for the pupils' performance which board is governing their school.

Session 3 4

6 September 2022 09:30 - 11:00

KG 5, 104

Symposium

Teaching and Teacher Education

Making a Case for Studying Teaching Quality Dimensions Jointly: Cognitive Activation and Adaptation

Keywords: Effective instruction and teaching, Effectiveness and efficiency, Primary education, Qualitative methods, Quantitative methods, Secondary education, Teacher professional development, Teaching approaches

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Anna-Katharina Praetorius, Institut für Erziehungswissenschaft, Switzerland

Chairperson: Charalambos Charalambous, University of Cyprus, Cyprus

Discussant: Thilo Kleickmann, Germany

Researching teaching quality in the educational effectiveness paradigm hinges on some core assumptions, including that the complex phenomenon of teaching and its quality can be divided into several separable dimensions that can be investigated independently from each other. Recently, some scholars question this assumption, calling for systematic work at different fronts—conceptualization, operationalization, and measurement—to examine if and how different dimensions are intertwined and how they might jointly contribute to student learning. In this context, this symposium aims at a critical reflection on the extent to which the interdependence of teaching quality dimensions can and has to be considered. Toward this end, we focus on two core dimensions, namely cognitive activation (i.e., the extent to which higher-order thinking is supported by teaching) and adaptation and differentiation (i.e., the degree to which inter-individual differences between students are sufficiently accounted for in teaching), which have attracted significant scholarly interest in the past. Paper 1 addresses the need of bringing together these two dimensions at a conceptual level, Paper 2 examines the potential and limitations of bringing them together only at the analysis level, whereas Paper 3 discusses the promise and the challenges of integrating them from conceptualization up to measurement.

Cognitive Activation and Adaptive Teaching: Would It Be Beneficial To Interconnect Them?

Presenting Author: Benjamin Caspar Fauth, University of Tübingen, Germany; **Co-Author:** Jasmin Decristan, University of Wuppertal; IDeA-Research Center, Germany; **Co-Author:** Hanna Dumont, University of Potsdam, Germany

In the present contribution, we bring together two theoretical concepts of recent teaching quality research: adaptive teaching and cognitive activation. Both concepts put emphasis on the individual student and his or her development during teaching. We suggest that linking the two would be mutually beneficial for educational research and educational practice. On the one hand, teaching quality research could profit from methodological approaches that have been developed in the context of research on adaptive teaching (e.g., experience sampling measures or video codings of individual teacher-student interactions). On the other hand, stronger focus on the principles of cognitive activation could certainly increase the effectiveness of certain adaptive teaching strategies. Regarding educational practice, we suggest that computer-based integrated formative assessments could bridge the gap between the theoretical considerations behind the two concepts and their implementation in everyday school practice. In summary, cognitive activation and adaptive teaching cannot work independently from each other.

Exploring the Interplay of Cognitive Activation and Adaptation Through Data Modeling: Is It Enough?

Presenting Author: Charalambos Charalambous, University of Cyprus, Cyprus; **Co-Author:** Anna-Katharina Praetorius, Institut für Erziehungswissenschaft, Switzerland

Cognitive activation and adaptation represent two core teaching dimensions which have typically been examined in parallel. Making a case for bringing them together, this paper first outlines different steps involved in working at their intersection. It then empirically examines whether exploring their interplay during the phase of data modeling is sufficient. Toward this end, utilizing data from the recent OECD TALIS Video-study and employing multi-level models, we investigate the main effect and the interaction of cognitive activation and adaptation—as captured through student surveys—on student cognitive and affective learning for each of the eight participating countries. Whereas for the cognitive outcome inconsistent main effects were found for either adaptation or cognitive activation in isolation, for the affective outcomes (interest and self-efficacy) both cognitive activation and adaptation were found to consistently have significant main effects; yet the effect of their interaction was mostly non-significant, with a few exceptions in which it was either positive or negative. In discussing these results we reflect on the merits and limitations of exploring the interplay of cognitive activation and adaptation only during the modeling stage.

Bringing Together Cognitive Activation and Differentiation from Conceptualization to Implementation

Presenting Author: Sofia Agathangelou, University of Cyprus, Cyprus; **Co-Author:** Charalambos Charalambous, University of Cyprus, Cyprus

Although scholars emphasize the importance of engaging *all* students in cognitively activating work as a means of promoting their learning, extant studies that clearly integrate cognitive activation with differentiation appear to be scarce. Drawing on a European project that brought together these two strands from its inception, we reflect on the entailments, promise, and open issues of working at the intersection of cognitive activation and differentiation. We first report on how this interplay was conceptualized for different phases of lesson planning and enactment; we then discuss how this conceptualization informed the design of a classroom observation instrument aiming to capture aspects of teachers' work when attempting to engage all students in cognitively activating work. Next, we turn to the implementation of a professional development program that aimed at supporting teachers engaging all their students in cognitively activating work. Utilizing both quantitative and qualitative data from classroom observations (three per teacher) and teacher interviews collected in the context of this program, we document observed and/or reported changes in teachers' practice when it comes to working at the intersection of cognitive activation and differentiation. We conclude by discussing the potential, limitations, and open issues of this work.

Keynote II: Prof. Dr. Gil Noam (Harvard Medical School) 1

6 September 2022 11:30 - 12:30

KG 5, 104

Keynote

Education in Times of Crisis: Learning, Development and Thriving in and Out of School

Keywords: Cross-national/cultural comparisons / international comparisons, Educational policy, Evaluation, School development and school improvement

Interest group: SIG 18 - Educational Effectiveness and Improvement

Session 4 1

6 September 2022 13:30 - 15:00

KG 5, 103

Single Paper

Developmental Aspects of Instruction, Teaching and Teacher Education

Session 4A: School Development and School Improvement

Keywords: At-risk students, Class and school composition, Collaborative learning, Design based research, Evaluation, Leadership, Meta-analysis, Qualitative methods, School development and school improvement, Teacher professional development

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Luisa Grützmaier, University of Vienna, Austria

Challenges of Disadvantaged Schools

Keywords: At-risk students, Class and school composition, Qualitative methods, School development and school improvement

Presenting Author:Luisa Grützmaier, University of Vienna, Austria; **Co-Author:**Julia Holzer, University of Vienna, Austria; **Co-Author:**Marko Lüftenegger, University of Vienna, Austria; **Co-Author:**Barbara Schober, University of Vienna, Austria; **Co-Author:**Manfred Prenzel, University of Vienna, Austria

Educational equity is still considered a key challenge for the education system. Schools with a high percentage of students from socially disadvantaged backgrounds face particular challenges (Klein, 2017). The purpose of this paper is to examine in more detail the challenges faced by those disadvantaged schools. The qualitative analysis of 100 disadvantaged schools in Austria revealed, that most schools report that they are challenged by (a) the lack of human resources, (b) the poor condition of the school building, the facilities in the rooms/building, (c) the disadvantageous prerequisites of the students and an unfavorable composition of the student body, and (d) the difficult cooperation with families and parental work. However, there are also differences between schools that are above or below the expected value of the educational standards in terms of the frequency with which challenges are mentioned. Schools that perform above the expected value in educational standards, for example, are more likely to report being challenged by the difficulty of working with families. Schools that perform below the expected value are more likely to report being challenged by the lack or ineffective formal structure within schools. The difference in experienced challenges could provide first insights into indicators of success.

Improving Schools in Challenging Circumstances – Impacts of a Design-based Development Program

Keywords: Collaborative learning, Design based research, Leadership, School development and school improvement

Presenting Author:Heinz Günter Holtappels, Center for Research on Education and School Development, TU Dortmund University, Germany; **Co-Author:**Lisa Brücher, Stadt Arnsberg, Germany

The longitudinal study with 31 schools in challenging circumstances in Western Germany was embedded in a design-based school development project (2014-2020). The schools could benefit from the intervention program by external support for systematic development procedures in a guided process, embedded in a project context with four elements: evidence-based quality assessment, development work in school-to-school networks, accompanying process advisors and staff development trainings. But the project could not gain short-term effects concerning process quality in schools. Considering the school networks the results show small effects over time. The longitudinal research comprises surveys of principals, teachers, students and parents (2015 and 2018) by standardized questionnaires capturing external and internal context factors. Multivariate analyses draw attention on relationships between leadership for learning, teacher commitment, professional teacher collaboration and school development work. The design-based improvement concept was successful but the organizational culture of schools make a difference concerning school improvement: Especially leadership for learning, professional teacher collaboration, teacher commitment and active involvement are important predictors for establishing school development capacity in schools concerning their ability for systematic school improvement strategies. The findings give recommendations for effective school development policies to improve schools in trouble.

A Meta-Analysis on the Effectiveness of Student Feedback on Different Aspects of Teaching Quality

Keywords: Evaluation, Meta-analysis, School development and school improvement, Teacher professional development

Presenting Author:Sebastian Röhl, University of Tübingen, Germany; **Co-Author:**Hannah Bijlsma, University of Twente, Netherlands; **Co-Author:**Martin Schwichow, University of Education Freiburg, Germany

In the scientific literature, many authors describe student feedback on teaching as a very useful instrument for the professional development of teaching at schools. Some findings indicate that some aspects of teaching are easier to improve than others. This meta-analysis aims at analyzing effects of student feedback intervention in schools on different aspects of teaching quality, using 314 effect sizes from 23 studies in a hierarchical three-level model. Results showed a mean weighted effect size of $d = 0.27$. Deepening moderator analyses indicate equal improvements for all analyzed aspects, except for scales related to the overall assessment of teaching. Therefore, our analyses suggest that student feedback is a very suitable instrument for the improvement of all aspects of teaching quality in schools. Further limitations and practical implications will be discussed.

Session 4 2

6 September 2022 13:30 - 15:00

Mensa, -202

Single Paper

Educational Policy and Systems

Session 4B: Educational Policies and Educational Reforms

Keywords: Accountability and school inspections, Case studies, Educational policy, Educational reform, Equity, Experimental studies, Large scale assessment / large scale survey, Longitudinal analyses/research, Program implementation and evaluation, School development and school improvement

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Izaak Dekker, Hogeschool van Amsterdam, Netherlands

Evidence-based Education: Objections and Future Directions

Keywords: Educational policy, Educational reform, Experimental studies, Program implementation and evaluation

Presenting Author:Izaak Dekker, Hogeschool van Amsterdam, Netherlands; **Co-Author:**Martijn Meeter, Vrije Universiteit Amsterdam, Netherlands

Over the past two decades, educational policymakers in many countries have favored evidence-based educational programs and interventions. However, Evidence-Based Education has met with growing resistance from educational researchers. This essay reviews the objections against Evidence-Based Education and its preference for randomized controlled trials (RCT). We conclude that the objections call for adjustments, but do not justify abandoning Evidence-Based Education. Three future directions could make education more evidence-based whilst taking the objections against Evidence-Based Education into account: 1) study local factors, mechanisms and implementation fidelity in RCTs, 2) utilize and improve the available longitudinal performance data and 3) use integrated interventions and outcome measures.

The Importance of Subsystems Within a Country. An Exploration of PIRLS and TIMSS Data of Flanders.

Keywords: Educational policy, Equity, Large scale assessment / large scale survey, Longitudinal analyses/research

Presenting Author:Jan Van Damme, KU Leuven, Belgium; **Co-Author:**Kim Bellens, Thomas More University College, Belgium; **Co-Author:**Wim Van Den Noortgate, KU Leuven, Belgium; **Co-Author:**Koen Aesaert, K.U.Leuven, Belgium

We explore the differences between the Flemish subsystems (Catholic schools and two kinds of public schools) in the quality of education and its equity. Therefore, we study the achievement level and the size of the effect of background characteristics such as the number of books at home, the educational level of the mother and the language spoken at home. We use the available data for TIMSS (grade 4 and 8) and PIRLS between 1995 and 2016. Multilevel research is used to account for the nesting of students within classes and classes within schools. We report a diversity of results. Taking the educational policy into consideration, we formulate possible explanations of our results.

Making Sense of Educational Governance Systems in a Swiss Canton

Keywords: Accountability and school inspections, Case studies, Educational policy, School development and school improvement

Presenting Author:Katriina Vasarik Staub, University of Zurich, Switzerland; **Presenting Author:**Katharina Maag Merki, University of Zurich, Switzerland; **Co-Author:**Herbert Altrichter, Johannes Kepler University Linz, Austria; **Co-Author:**Claudia Marusic-Würscher, University of Zurich, Switzerland

Previous research shows that modern governance systems include many different actors and that decision making powers can be distributed across multiple governance levels. Although essential drivers and barriers for capacity building have been identified, it still remains an open question how formal structures and rules are interwoven in everyday practices and how different actors relate to each other in order to exchange knowledge and develop educational practices. Therefore, our study aims to reconstruct the formal and performed educational governance structure in Swiss cantons. The research questions were analysed in a multi-method case study in one Swiss-German canton. Group discussions as well as social network analyses were conducted. The results revealed that the coordination mode is strongly oriented towards 'negotiation' and 'observation'. Nevertheless, school improvement is implemented in a top-down manner with little room for manoeuvre in individual schools. There are substantial differences between the formal governance structure and the coordination practice and the results point to several tensions in the cantonal governance structure. Implication for practice and further research are discussed.

Session 4 3

6 September 2022 13:30 - 15:00

KG 5, 104

Symposium

Educational Policy and Systems

Educational Pathways in Stratified Education Systems: Findings from the Swiss TREE Panel Study

Keywords: Ability grouping and tracking, Achievement, Class and school composition, Educational attainment, Equity, Large scale assessment / large scale survey, Longitudinal analyses/research, Mixed-method research, Parental involvement in learning, Secondary education

Interest group:

Chairperson: Thomas Meyer, Switzerland

Discussant: Katharina Maag Merki, University of Zurich, Switzerland

Against the backdrop of the conference's overarching topic of inclusion, the proposed symposium explores learners' educational pathways in a strongly tracked and stratified education system such as that of Switzerland, at the threshold to post-compulsory education and beyond. It does so drawing on exemplary analyses performed with data of the Swiss TREE panel survey. The selection of three papers to be presented in the symposium aims at reflecting the far-reaching, in-depth, multi-dimensional analytical potential that the multi-cohort TREE panel offers in the third decade of its existence. Paper one explores to what degree individual and institutional factors impact the overall transition from lower- to upper-secondary education in Switzerland, comparing the two TREE cohorts from 2000 and 2016. By means of multilevel analyses controlling for predictors at individual and school level, the second paper examines how tracking and school composition shape the very same transition of the first TREE cohort. The symposium concludes with a third paper on the role of parental investment in their children's education, highlighting TREE's mixed-methods potential by ways of drawing on both quantitative and qualitative data of the second TREE cohort.

Cross-cohort analysis of transitions to post-compulsory education: Revisiting the meritocratic issue

Presenting Author:Thomas Meyer, Universität Bern, Switzerland; **Co-Author:**Andrés Gomensoro, Universität Bern, Switzerland

With the launch of its second cohort of compulsory school leavers in 2016 (TREE2), the TREE study (Transitions from Education to Employment) has been successfully extended to the first multi-cohort youth panel survey in Switzerland. The proposed contribution provides a first overview of salient results pertaining to the cohort's crucial transition from lower to upper-secondary education, including a synoptic comparison with the first TREE cohort (TREE1), which made the same transition 16 years earlier. Beyond cohort-comparative descriptive findings, multivariate analyses aim at investigating relevant mechanisms underlying this crucial transition in adolescents' educational pathways. In doing so, a particular focus lies on the role of skills, achievement and the pronounced tracking at the lower-secondary level of education that characterises the Swiss education system.

Inequality in Transitions to Upper-Secondary Education: The Role of Tracking and School Composition

Presenting Author:Katja Scharenberg, University of Education Freiburg, Germany; **Co-Author:**Wolfram Rollett, University of Education Freiburg, Germany

Many countries worldwide apply some kind of ability-based between-school tracking at some point in students' educational career. Tracking might result in educational inequalities that can be explained by different institutionalized learning opportunities as well as by school-specific differences in student body composition. The present paper focuses on Switzerland where tracking in secondary education starts when students are at the age of about 12. We examined whether and to what extent tracking and school composition shape students' transition from compulsory education at lower-secondary level to post-compulsory education at upper-secondary level. Our analyses based on data from the Swiss panel survey "Transitions from Education to Employment" (TREE). In multilevel analyses, controlling for predictors at individual and school level, we found that students from academic tracks had higher transition probabilities. Students from more privileged schools regarding their social composition were twice as likely to manage this transition successfully as students from less privileged schools. Yet, as expected, compositional and tracking effects were strongly confounded. Beyond this, we observed differential transition probabilities depending on the schools' social composition within higher tracks.

The Role of Parental Investment (of Migrants) For Young Adults' Educational Success

Presenting Author:Andrés Gomensoro, Universität Bern, Switzerland; **Co-Author:**Chantal Kamm, Universität Bern, Switzerland; **Co-Author:**Sandra Hupka-Brunner, Universität Bern, Switzerland; **Co-Author:**Marieke Heers, Université de Lausanne, Switzerland

Migrant parents often have higher educational aspirations for their children than majority group parents. However, little is known on how this is related to and translated into educational achievements. To extend the knowledge on children of migrants' success against the odds, this study will focus on how parental investments (PI - defined as an interplay between parental aspirations, resources and strategies) contribute to a successful lower and/or upper secondary education for migrants' descendants. For this purpose, we rely on a mixed method design and a comparative approach between native and migrant families. First, we make use of the second cohort of the "Transitions from Education to Employment" (TREE2) panel survey (a longitudinal follow-up of compulsory school leavers in Switzerland; n=8,429) to investigate the relationship between PI and educational success at the end of lower secondary and at the entry of upper secondary school. Second, we introduce a typology of parental investment based on qualitative interviews undertaken with educationally successful TREE2 respondents (n=71) and one of their parents with modest social origin and without tertiary education (n=48). We show that not only parental aspirations but also their strategies play an important role for the educational success of their children.

KeynoteIII:Prof.Dr.UmeshSharma(MonashUniversity)1

6September 202215:30-16:30 KG5,104

Keynote

WhyAreSomeTeachersSuccessfulIncludingAllLearnersWhileOthersStruggle?

Keywords: Attitudes and beliefs, Inclusive education, Self-efficacy, Teacher professional development

Interest group: SIG 18 - Educational Effectiveness and Improvement

Application of international research to the local contexts Classrooms worldwide are becoming increasingly diverse. Many learners, who were previously excluded, are now attending regular classrooms. It is clearly a significant positive trend. However, attending a regular school does not guarantee that a student would be truly included. A learner could be considered fully included when they *participate* in school activities like their peers, when they *achieve* socially and academically, when they are fully *accepted* by their peers and the rest of the school communities, and when they have *a sense of belongingness and happiness*. It is not easy to achieve inclusion for all. Teachers play an extremely important role in ensuring that a learner is fully included. A number of researchers have made attempts to identify factors that could explain why some teachers are successful in including all while others struggle. In this presentation, I will present what we have learned from international research on this topic. A key objective of my presentation is not just to present findings, as I believe, many of the conference participants may already be aware of some of the key findings, but it is to provide a useful framework that could be used by researchers, policymakers and practitioners to determine if schools (and teachers) are ready to include *All* learners. And if not, then what do we do? I will also provide new ways that we can use to prepare future generation of teachers who can successfully include *All* learners.

Session 5 1

7 September 2022 09:30 - 11:00

KG 5, 103

Single Paper

Assessment and Evaluation, Educational Policy and Systems

Session 5A: Effectiveness and Efficiency

Keywords: Class and school composition, Educational attainment, Effective instruction and teaching, Effectiveness and efficiency, Equity, Evaluation, Meta-analysis, School development and school improvement, Secondary data analysis, Secondary education

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Tryfonas Papadamou, University of Cyprus, Cyprus

Developing and Testing the Dynamic Model of Educational Effectiveness: A Systematic Review

Keywords: Effective instruction and teaching, Effectiveness and efficiency, Evaluation, Meta-analysis

Presenting Author:Tryfonas Papadamou, University of Cyprus, Cyprus; **Co-Author:**Leonidas Kyriakides, University of Cyprus, Cyprus; **Co-Author:**Elena Kokkinou, University of Cyprus, Cyprus; **Co-Author:**Maria Anastasou, University of Cyprus, Cyprus

This paper presents the methods and main findings of a synthesis of 160 effectiveness studies conducted during the last 12 years (i.e., 2005-2017). This synthesis of studies was undertaken in order to test the validity of the dynamic model of educational effectiveness and identify how to improve it further. Effectiveness studies conducted in various countries and in different phases of education reveal the importance of student, teacher, and school factors included in the dynamic model but: a) students' personality traits, b) students' thinking styles, and c) one of the factors measuring the School Learning Environment namely the development of positive attitudes towards learning. This synthesis also raises doubts about the assumption of the model that the frequency dimension of teacher and school factors have a curvilinear relationship with learning outcomes. Implications of findings for research on educational effectiveness are drawn and an improved version of the dynamic model is proposed.

Unravelling School and Teacher Academic Optimism for Maximising All Students' Learning Opportunities

Keywords: Class and school composition, Effectiveness and efficiency, Equity, School development and school improvement

Presenting Author:Ruud Lelieur, University of Antwerp, Belgium; **Co-Author:**Noel Clycq, University of Antwerp, Belgium; **Co-Author:**Jan Vanhoof, University of Antwerp, Belgium

Academic optimism is the reflection of a triadic set of interactions between efficacy, trust, and academic emphasis, which positively correlates with students' performance, also after controlling for SES and migration background. A distinction is made between school academic optimism (SAO), a characteristic of the

and parents, and to emphasize academic achievement. This research focuses on the extent to which these subconcepts of TAO vary with the degree of SAO, considering the influence of school composition, and the extent to which the subconcepts of TAO vary with composition features of the class. Understanding the influence of these compositional characteristics on the degree of both SAO and TAO is important in developing maximum learning opportunities for all students. The data was collected from a sample of 1061 teachers from 37 secondary schools in Antwerp, Belgium. SEM analyses show the differential influence of school composition on SAO. Results also indicate teacher's trust being compromised in classes with more boys or more students from lower SES or migrant backgrounds, while higher levels of SAO can compensate. Theoretical and practical implications are presented.

Student Mobility: Extent, Impacts, and Predictors for Secondary School Students in England

Keywords: Educational attainment, Effectiveness and efficiency, Secondary data analysis, Secondary education

Presenting Author:Lucy Prior, University of Bristol, United Kingdom; **Co-Author:**George Leckie, University of Bristol, United Kingdom

Moving school is a major event for students, with potential impacts on both student and school performance. Students can experience a diversity of move types, including variation in timing, origin, and destination, though this complexity is not always acknowledged in studies or educational policies, which tend towards binary distinctions of movers versus non-movers. However, it is crucial to understand the vulnerabilities and outcomes associated with different mobility types, including to inform more effective and efficient targeting of support. We therefore study the extent, impacts and predictors of a diverse range of school moves during secondary schooling for a cohort of students completing their end of school examinations in 2018/19 in England. We highlight a negative association between mobility and achievement for all movement types, however, we find substantial heterogeneity in the strength of their association with student performance and highlight the likelihood of making different types of school moves varies by student characteristics. Therefore, we recommend the wider consideration and examination of diverse mobility features by research and in educational accountability systems.

Session 5 2

7 September 2022 09:30 - 11:00

Mensa, -202

Single Paper

Instructional Design, Learning and Special Education

Session 5B: Inclusive Education

Keywords: Classroom climate, Curriculum change and development, Disability, Diversity education, Effective instruction and teaching, Inclusive education, Learning approaches, Primary education, Social participation, Teaching approaches

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Irit Sasson, Israel

The Challenge of Diversity: Universal Design for Learning in Innovative Learning Spaces

Keywords: Classroom climate, Curriculum change and development, Diversity education, Teaching approaches

Presenting Author:Irit Sasson, Tel-Hai College, Israel; **Co-Author:**Shirley Miedijensky, Oranim Academic College, Israel; **Co-Author:**Itamar Yehuda, Tel Hai Academic College, Israel

Recent years have marked the development of constructivist pedagogical principles for designing innovative and flexible learning spaces that address student diversity based on the philosophy of universal design for learning – UDL. The goals of this study were (1) to compare the expression of select UDL principles in innovative learning spaces and traditional classes; and (2) to measure the effect of select UDL principles and learning space on the relationship between teaching style and classroom management. A total of 507 observations were carried out to document classroom pedagogical and discipline management, 265 (52%) in traditional classrooms and 242 (48%) in the innovative learning spaces of four elementary schools in the same geographical region. The results indicate that the rate of student-centered learning and pedagogical practices that express UDL principles was significantly higher in innovative spaces than in traditional classes. A moderate, positive, and significant correlation was found between teacher-centered learning and number of classroom discipline events. In addition, the learning space, integration of tasks that encourage choice, and integration of tasks that address learners' differences were found as significant moderating variables of the relationship between teacher-centered learning and the number of classroom discipline events.

Evaluating the Accessibility of Experimental Instructions in Inclusive Science Classrooms

Keywords: Effective instruction and teaching, Inclusive education, Learning approaches, Social participation

Presenting Author:Martina Graichen, University of Education Freiburg, Germany; **Co-Author:**Silke Mikelskis-Seifert, University of Education Freiburg, Germany; **Co-Author:**Michaela Oettle, University of Education, Freiburg, Germany; **Co-Author:**Wolfram Rollett, University of Education Freiburg, Germany; **Co-Author:**Katja Scharenberg, University of Education Freiburg, Germany

Scientific literacy is a prerequisite for social participation in Science education and can be fostered through learning environments in which students conduct scientific experiments on their own. For experimental environments to be effective, they need to be designed to overcome physical, cognitive, linguistic, social, or other barriers in order to ensure access and participation in the experimental process for all students irrespective of their individual learning preconditions. The demand for accessibility must particularly adhere to the experimental instructions provided to students. While accessibility is already well-defined in many areas of life, a definition in the context of experimental instructions in Science education is lacking. In our project, we define four different aspects of accessible experimental instructions: Functional, linguistic, and visual accessibility as well as accessibility to the communication or action. A theoretically based instrument is introduced that measures the accessibility of experimental instructions in Science classes as perceived by students. A pilot study of the instrument with $n=115$ secondary-school students in Germany proved the theoretically derived dimensionality of accessibility in experimental instructions. Furthermore, the data reveals how different groups of students with different learning prerequisites perceive accessibility in experimental instructions in Science classes.

Effective Teaching for Students with Special Educational Needs: A Scoping Review

Keywords: Disability, Effective instruction and teaching, Inclusive education, Primary education

Presenting Author:Jolien Delafontaine, KU LEUVEN, Belgium; **Co-Author:**Sara Nijs, KU LEUVEN, Belgium; **Co-Author:**Koen Aesaert, K.U.Leuven, Belgium; **Co-Author:**Laura Fluyt, KU LEUVEN, Belgium

Effective teaching is a crucial factor contributing to students' learning, especially for students at-risk such as those with special educational needs (SEN). As these students increasingly fall behind their peers without SEN in academic achievement, there is an urgent need to enhance learning outcomes for this specific group of students. Nevertheless, teacher effectiveness research so far focuses almost exclusively on identifying generic teaching behaviours that work for all students in all contexts. Our knowledge of effective teaching behaviours tailored to students with SEN is, therefore, limited. Moreover, little research has examined differences in effective teaching for students with SEN in inclusive versus special classrooms. To address these issues, this scoping review aims to summarize the literature on effective SEN teaching. Of the 9791 articles originally identified, 82 were included. Preliminary results show that most studies focused on students with learning disabilities or emotional and behavioral disorders in inclusive classrooms. Furthermore, differences in teaching behaviours were found between studies depending on (1) the student outcome studied (reading comprehension and/or non-cognitive outcomes); and (2) the classroom context (inclusive, special or resource classrooms). A comparison of effective teaching behaviours between classroom contexts is made and implications regarding effective SEN education are discussed.

Session 5 3

7 September 2022 09:30 - 11:00

KG 5, 104

Symposium

Modifying Pathways and Programs: Student Academic Outcomes and Future Earnings

Keywords: Ability grouping and tracking, Achievement, At-risk students, Disability, Educational attainment, Equity, Higher education, Longitudinal analyses/research

Interest group: SIG 18 - Educational Effectiveness and Improvement, SIG 19 - Religions and Worldviews in Education

Chairperson: Gillian Parekh, York University, Canada

Discussant: Robert Brown, York University, Canada

When a student is perceived as academically struggling or as unable to meet particular academic expectations, educators and school teams can elect to make changes to a number of program factors. These three studies examine the implications of popular strategies Ontario educators employ with the aim of supporting students. Using system data from a large Canadian school board and a QuantCrit-informed methodological approach, the first study examines the practice of curricular modifications in Grade 8 Mathematics. It shows that seemingly small decisions to modify students' curriculum can significant long-term implications, including the exclusion from postsecondary education. The second study examines the implications of shifting or reducing academic program expectations in high school. Through this qualitative study with high school students, authors examine how streaming structurally reproduces and upholds white supremacist ideologies and disproportionately privileges white, wealthy families while at the same time disadvantaging racialized, low-income students and students constructed as disabled. The final study draws on unique Ontario data linkages. Disability appears to be a key organizational factor around which students are placed into academic trajectories in secondary and postsecondary study; even when students with disabilities complete their postsecondary education, there is a significant and pervasive gap in income.

Long-term Implications of Modifying Grade 8 Mathematics Curriculum in Ontario, Canada

Presenting Author:Robert Brown, York University, Canada; **Co-Author:**Samuel Zheng, Toronto District School Board, Canada; **Co-Author:**Gillian Parekh, York University, Canada; **Co-Author:**Katherine Barron, York University, Canada

'Modifying Curriculum' is one of the learning strategies employed through Special Education in Ontario, Canada's largest province, and generally refers to the reduction of curricular material teachers are expected to teach particular students involved in special education. Between 10-15% of all elementary students in the Toronto District School Board (TDSB) have been placed on a modified curriculum by the time they finished Grade 8, yet there is almost no research on the long-term effects of modified curriculum. This pioneering study used information on 11K Grade 8 students in the TDSB, and then followed the students until they had completed their transition into post-secondary studies. The key research question of this exploratory study was to see if modified curriculum in Grade 8 Mathematics had a significant effect on student postsecondary pathways. Results of a logistic regression found that even with Grade 6-8 Mathematics achievement, Disability, Learning Skills, and socio-demographic variables taken into account, students taking Grade 8 Modified Curriculum in Mathematics were noticeably less likely to apply to postsecondary studies, thereby limiting their future lifetime earnings and long-term health.

Academic streaming, systemic racism & critical notions of care

Presenting Author:Gillian Parekh, York University, Canada; **Co-Author:**Karen Murray, Toronto District School Board, Canada; **Co-Author:**Alison Gaymes San Vicente, Toronto District School Board, Canada

This study examines the implications of shifting or reducing academic program expectations in high school. Placing students in tiered program levels in high school, also known as academic streaming, has historically resulted in limited academic and postsecondary education opportunities. However, through this qualitative study with high school students, the authors examine how streaming structurally reproduces and upholds white supremacist ideologies and disproportionately privileges white, wealthy families while at the same time disadvantaging racialized, low-income students and students constructed as disabled. In speaking to students who had been academically streamed into non-Academic programming, the data revealed how aware students were of racism being a factor in their academic exclusion as well as their recognition of the pervasive deficit orientation associated to non-Academic programming and notions of care. Results revealed that deficit orientation permeated practice and perception of student capacity, of which students consumed and embodied.

Postsecondary access, graduation, and future earnings for students with disabilities

Presenting Author:David Walters, University of Guelph, Canada; **Co-Author:**Gillian Parekh, York University, Canada; **Co-Author:**Robert Brown, York University, Canada

In Canada, access to postsecondary education is becoming ever more critical in terms of securing future employment, long term health, and economic security. The purpose of this study is to identify where systemic barriers continue to exist and reduce access to PSE for students with disabilities. Using a critical disability studies framework, the study employed multiple methods of inquiry including a) a literature review on disability-related barriers the public PSE sectors b) a Canada-wide scan examining disability-related investments for postsecondary students and c) an analysis using a unique dataset that linked Toronto public school data with Canadian postsecondary and tax information. This study finds evidence of the critical factors that collude to *disable* students' participation in PSE. The literature review reveals clear barriers embedded within the K-12 education system. The quantitative research study lends important evidence to the ongoing inequity disabled students face in accessing and completing their postsecondary programs. Students with disability are almost twice as likely to not participate in postsecondary education, and less likely to graduate, compared to their non-disabled peers. Should students with disability make it through their postsecondary program, they are unlikely to reach income parity with their non-disabled peers.

Session 6 1

7 September 2022 11:30 - 13:00

KG 5, 103

Single Paper

Assessment and Evaluation, Educational Policy and Systems

Session 6A: Tracking and Placement

Keywords: Ability grouping and tracking, Achievement, Class and school composition, Data-based decision making and data use, Educational policy, Effectiveness and efficiency, Equity, Inclusive education, Learning and developmental difficulties, Quantitative methods, Quasi-experimental research, Secondary education

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Heather Price, United States

How Privilege Monopolizes High Quality Advanced Placement Courses despite Efforts to Widen Access

Keywords: Data-based decision making and data use, Educational policy, Equity, Quantitative methods

Presenting Author:Heather Price, Loyola University Chicago, United States

The rise in "college for all" expectations across American high schools does not appear to be impacting college enrollment and graduation rates at equivalent magnitude. This study uses the Civil Rights Data Collection (CRDC) to evaluate the quality of Advanced Placement college prep coursework across US high schools to understand the inequities across socio-demographic and diversity characteristics between schools to understand the variation in high school quality. Findings support theoretical ideas of inequitable learning opportunities influencing the flow of educational outcomes for high school students. Material, human, and social resources of the districts explain disparity outcomes and lead to a select few privileged groups attaining the embodied college prep educational capital.

Semi-hidden Tracking in the Finnish Comprehensive School

Keywords: Ability grouping and tracking, Achievement, Class and school composition, Secondary education

Presenting Author:Sirkku Kupiainen, University of Helsinki, Finland; **Co-Author:**Ninja Hienonen, University of Helsinki, Finland

Arguments regarding ability grouping centre for the most part on a trade-off between equity and efficiency. The central argument *for* tracking is based on a homogeneous classroom's permitting a curriculum and instruction-pace focused on each student's actual performance level, leading to better learning for all. Arguments *against* tracking centre on concern for lower ability students being disadvantaged by less high-striving curricular content, less favourable peer effect and even lower teacher proficiency. In the current study, we set to investigate the reasons for the large between-class differences in the Finnish comprehensive school, known in PISA for equality and small between-school differences. We draw on data from a 2011–2018 longitudinal study of Helsinki comprehensive school students (N=4,075). The results revealed that 36 percent of ninth graders studied in an aptitude-based selected class (academic or non-academic emphasis) and 5 percent in small classes comprising SEN students. Students in selective classes clearly outperformed students in the regular and SEN classes, had more positive motivational attitudes, and set to continue their studies in the academic track of upper secondary education more often than the others. The study sheds light on class-allocation and its relation to learning outcomes in a country known for educational equality.

Is Special Education More Effective than Mainstream Education for Special Needs Students?

Keywords: Effectiveness and efficiency, Inclusive education, Learning and developmental difficulties, Quasi-experimental research

Presenting Author:Fernando NUNEZ-REGUEIRO, Université Grenoble Alpes, France

This communication presents a study on the effects of mainstream education (vs. special education) on the learning outcomes of special educational needs (SEN) students. **THEORY:** Current reviews support the effectiveness of mainstream education (vs. special education), but also point to several identification issues in previous studies. To address these issues, a selection modeling approach is presented that consists in jointly modeling the selection process (i.e., mainstream vs. special education) and the outcomes processes of interest (i.e., learning outcomes). **AIMS AND HYPOTHESES:** We expect that conventional linear regression models will produce similar findings as in reviews (H1), but that selection models will produce opposite results (H2). **METHOD:** We use data from a national representative sample of French middle school students (N = 28992) including background variables, and tests on multiple academic abilities at the beginning (controls) and end of middle school (outcomes). **RESULTS:** Aligning with H1, linear regressions show that mainstream education (vs. special education) has positive or null effects on gains in learning for SEN students. Aligning with H2, selection models show that these effects are actually negative once the covariance between selection and outcomes processes are accounted for. Implications for effective practices in inclusive education are discussed.

Session 6 2

7 September 2022 11:30 - 13:00

Mensa, -202

Single Paper

Higher Education, Teaching and Teacher Education

Session 6B: Higher Education and Teacher Education

Keywords: At-risk students, Data-based decision making and data use, Educational reform, Evaluation, Experimental studies, Higher education, Quantitative methods, Teacher education, Teacher professional development

Interest group: SIG 18 - Educational Effectiveness and Improvement

Chairperson: Kathryn Bartimote, The University of Sydney, Australia

Barriers to First-year Student Success in the Humanities and Social Sciences

Keywords: At-risk students, Data-based decision making and data use, Higher education, Quantitative methods

Presenting Author:Kathryn Bartimote, The University of Sydney, Australia; **Co-Author:**Fang-Tzu Hu, The University of Sydney, Australia; **Co-Author:**Nicholas Ho, The University of Sydney, Australia; **Co-Author:**Alexandre Lefebvre, The University of Sydney, Australia; **Co-Author:**Alyson Simpson, The University of Sydney, Australia

Institutional data for 5,173 first-year undergraduate Humanities and Social Science (HASS) students were analysed to understand the relative importance of student background, student behaviour, and learning environment factors in explaining student success. Machine learning (ML) techniques were used in conjunction with mixed-effects modelling to determine barriers to student success. Four ML algorithms were applied, and classification models built with 10-fold cross validation. The person-behaviour-environment triangle presented by social cognitive theory was helpful in guiding the analysis. Student behaviours were found to be the most important category in explaining unsatisfactory academic progress, with subject choices and engagement being particularly salient. Choices outside of HASS core areas were problematic, particularly STEM subjects. Regular and consistent learning engagement throughout semester was related to success. Implications for student support, diagnostics and academic advising are discussed.

Deceiving Appearances? Probing Predictors of Study Delay to Assess Feasibility of a Study Program

Keywords: Educational reform, Evaluation, Higher education, Teacher education

Presenting Author:Jan Henning-Kahmann, University of Education, Freiburg, Germany; **Co-Author:**Wolfram Rollett, University of Education Freiburg, Germany; **Co-Author:**Stefanie Vigerske, Freiburg University of Education, Germany

Due to structural features and particularities of initial teacher education (ITE) in Germany (Hilligus, 2014) some universities restructured ITE only recently, still facing the challenge of improving and ensuring the feasibility of their newly implemented study programs. Checking if study credits are in accordance with the scheduled curriculum in the course of the studies allows universities to carefully monitor the process and outcomes of restructuring their ITE. This study aims at capturing factors perceived by teacher students as obstructive for receiving the desired credit in their course of study, as well as the number of students by which credits are reported to be not in accordance with the scheduled curriculum of the course of study, i.e. delayed. Results show that despite largely criticizing factors on the part of conditions or structures of studies, teacher students primarily show a delay in their course of study for personal reasons.

Two Studies, One Result: Student Teachers are Biased by Anchors When Engaging With Evidence

Keywords: Data-based decision making and data use, Experimental studies, Quantitative methods, Teacher professional development

Presenting Author:Kirstin Schmidt, University of Education Karlsruhe, Germany; **Presenting Author:**Kristina Bohrer, University of Education Karlsruhe, Germany; **Co-Author:**Samuel Merk, University of Education Karlsruhe, Germany

In order to enhance their practice and to improve learning environments, teachers are encouraged to handle different types of evidence in their professional actions, ranging from formal or informal generated raw data to results of educational research. Among others, cognitive biases such as anchoring effects can distort the adequate engagement with such evidence. However, empirical studies on the influence of anchoring effects on engaging with evidence in the educational context are scarce. Therefore, we conducted two experimental studies with teacher students at the Karlsruhe University of Education (N1 = 34, N2 = 220) analyzing 1) the influence of anchoring effects on engagement with data as well as on 2) the interpretation of scientific evidence. Based on Bayesian analyses we got some evidence for large effects of anchor in Study 1 (d = 1.36, BF10 = 2.45) and strong evidence for anchoring effects in the second study (d = 2.97, BF10 > 100), which indicates that student teachers are underlying anchoring effects while engaging with data and evidence.

Session 6 3

7 September 2022 11:30 - 13:00

KG 5, 104

Symposium

Assessment and Evaluation, Teaching and Teacher Education

Teachers' Use of Data for Decision Making: Perspectives on Processes and Preconditions

Keywords: Curriculum change and development, Data-based decision making and data use, Effective instruction and teaching, Evaluation, Experimental studies, Inclusive education, Quantitative methods, School development and school improvement, Teacher professional development

Interest group: SIG 11 - Teaching and Teacher Education, SIG 18 - Educational Effectiveness and Improvement, SIG 23 - Educational Evaluation, Accountability and School Improvement (merged with SIG 18)

Chairperson: Jana Groß Ophoff, Austria

Organiser: Elmar Souvignier, University of Muenster, Germany

Discussant: Kim Schildkamp, University of Twente, Netherlands

Theoretical data-based decision making frameworks describe the process of data use as a sequence of steps that are comparable to the research cycle: After receiving data feedback for a particular purpose, teachers (can) gain an understanding of possible relevant information contained, draw conclusions based on that, and – if necessary – develop, implement and evaluate actions for improvement. In order for data use to have an impact on teacher professionalization and development processes, influencing factors like data, user, and organizational characteristics need to be taken into account. Accordingly, this session aims at gaining further insights about effects on the process of data-based decision making. In four presentations from Germany, Belgium, and the Netherlands, not only teachers' data literacy, motivation and beliefs are taken into account, but also the effects of different forms of data presentation, and support measures on data use and student performance. In the concluding discussion, approaches how to further support (or hinder) professional development will be outlined.

From Data to Information. Teacher's Perceptions of Graphical Feedback Properties

Presenting Author:Samuel Merk, University of Tübingen, Germany; **Co-Author:**Jana Groß Ophoff, University College of Teacher Education Vorarlberg, Austria; **Co-Author:**Sarah Bez, University of Tuebingen, Germany

Teachers all over the world are more and more called upon incorporating data use into their daily practice, as it is assumed that the information within the data can beneficially inform their practice. In two highly controlled laboratory experiments, we investigated teachers' ability to extract relevant information from data in two different contexts (using computer-based behavioral experiments): Results indicate that teachers are able to identify mean differences in reports from statewide tests accurately (high correlations with objective effect sizes), but exhibit low sensitivity (even moderate effect sizes were gauged as negligible). While exploring data from self-constructed assignments of virtual colleagues in order to identify relevant information and devise possible pedagogical implications, teachers spontaneously described several entities known from descriptive statistics (e.g. skewness, modality, dispersion, outliers) in their own words correctly while thinking aloud. Nonetheless, the between-person variance of correctly recognized distribution properties was substantial. In conclusion, implications of these results for professional development will be discussed, as well as more ecologically valid research approaches as desideratum.

Teachers' Knowledge & Skills For Adaptive Decision-Making – With and Without Software for Students

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In an increasing amount of primary schools, paper booklets have been replaced by software applications. An advantage of using this software is that teachers can monitor student progress on real-time dashboards. The idea is that the use of this software decreases workload for teachers and provides them with valuable information to base instructional decisions on. Data from these dashboards are supposed to enhance instructional decision-making for differentiation. However, it is unclear whether teachers need specific skills and knowledge to use the data from these software systems adequately in order to differentiate their instruction. In this study a cognitive task analysis (CTA) of differentiated instruction while using (adaptive) software was performed, and results were compared with results of a CTA of differentiated instruction in schools where more traditional curriculum materials and paper booklets were used for mathematics. Results show that underlying teacher skills required for providing differentiated instruction are comparable. Although at a glance these contexts differ substantially, the differences appear to be primarily related to organizational aspects. Additionally, teachers using software also need to have deep knowledge about and insights in the systems they work with in order to make accurate decisions.

School performance feedback use in Flanders: Exploring the interplay of drivers for data use

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Practitioners, policymakers and scholars increasingly attest to the importance of data-driven decision making in education. The present study aimed to explore how certain predictors of data use for school improvement interact and interplay. It was conducted in Flanders, a low-accountability educational setting, and zoomed in on the use of school performance feedback (SPF) that schools gain by participating in large-scale national assessments or voluntarily taking parallel tests. Primary and secondary school leaders and teachers (n=470) were surveyed about their behavioral, normative and self-efficacy beliefs regarding SPF, and aspects of school culture concerning SPF. The significance of these factors as predictors of SPF use was explored through a path analysis that also took into account the user's role within the school and the feedback sign of a focal report. Selected findings include that behavioral and normative beliefs mediate the effect of school- and user-level predictors of SPF use, but only to a limited extent. Whereas self-efficacy beliefs do not explain SPF use, they are influenced by the same school- and user-level characteristics and by the school's relative performance as presented in the feedback. Voluntariness in feedback pursuit and SPF-oriented school culture emerge as drivers of SPF use.

Data-based decision making in schools: Examining the process and effects of teacher support

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Providing teachers with data on students' learning progress is expected to support adaptive instruction and, thereby, lead to higher learning progress of students. Several studies on data-based decision-making (DBDM) underline that providing teachers with instructional recommendations and material has beneficial effects on the DBDM process. The aim of our study was to analyze the relationships between intensity of teachers' use of assessment information, instructional decision-making, and students' learning progress as well as potential beneficial effects of additional support for teachers. Our sample consisted of N=127 teachers and N=2594 students (grade 3) from three intervention studies. All teachers applied an internet-based learning progress assessment (LPA) tool and we varied how much support teachers received in implementing the several steps of the DBDM process. To quantify teachers' data analysis behavior, we used the system-generated logfile-data. Structural equation modeling was used to analyze the DBDM process and the mediational role of data-use and instruction. Results indicate positive effects of data-use on instruction and students' learning progress, but no effects of teachers self-reported intensity of individualized instruction on students' learning progress. Providing teachers with additional support had a positive impact on intensity of data-use, but no significant effects on instruction and on learning progress.