

# LUXERA

Conference 2025

5 - 6 November

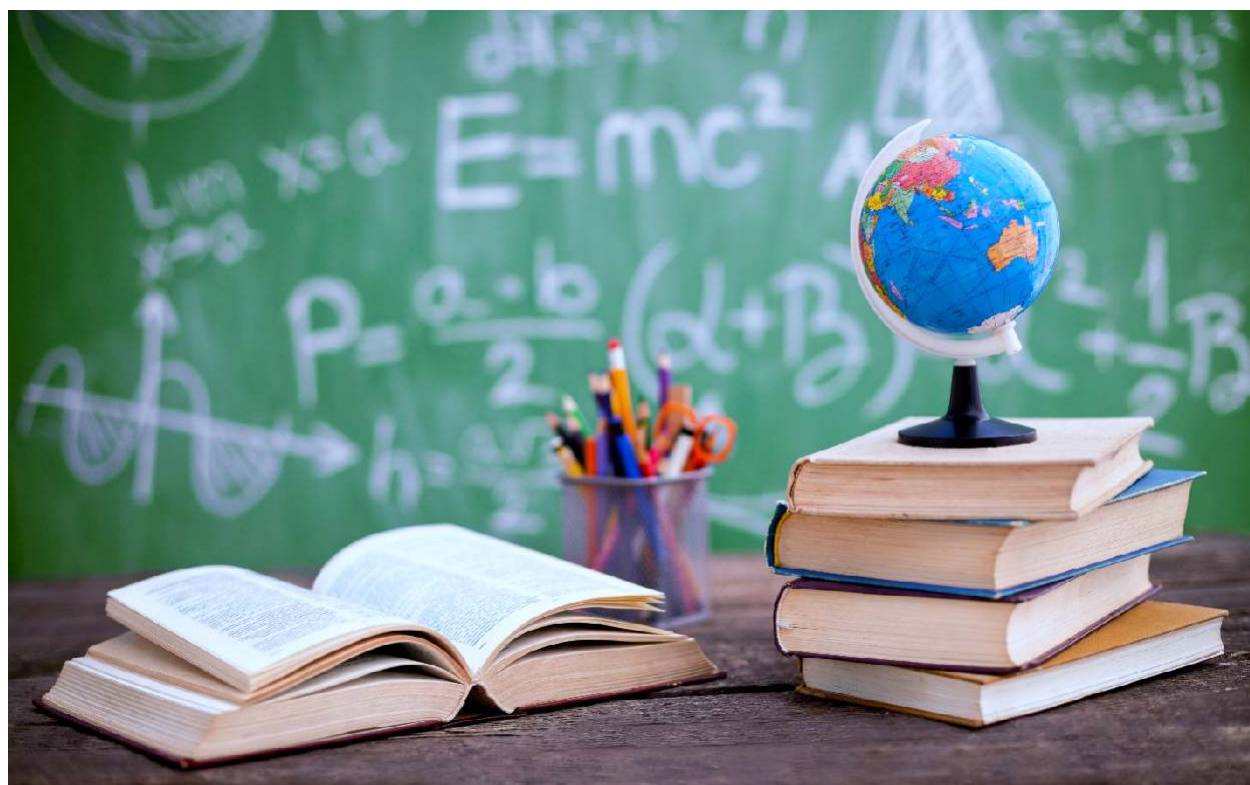
University of Luxembourg

Campus Belval-MSA

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Conference Booklet

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## Welcome Address

Dear participants of the 2025 LuxERA Emerging Researchers' Conference,  
Dear members of the Luxembourg Educational Research Association

We are very happy to welcome you to the 2025 LuxERA Emerging Researchers' Conference, a conference organized by and for our emerging researchers. The conference is an important opportunity for researchers and stakeholders in and beyond Luxembourg to share their work with others, to gain feedback and to exchange interesting ideas.

This year, there is not only a focus on exchanging new research ideas and findings, but also a chance to take part in workshops, covering different topics I would like to thank the coordinators of the workshops (i.e., Carole Dording, Justin Powell, Marcelo Marques as well as Louis Krieger and Sebastian Elixander of the Science Teens lab) for their availability and willingness to offer this valuable learning opportunity to our members and participants. We are very happy that Marcela Pozas, Uni.Lu professor for educational diversity management, will talk to us about Rejection, Revision, and Resubmission as a real story of academic success. In addition, the conference incorporates a "fireside chat", where early career and more senior researchers share experiences related to rejection in academia and how to turn disappointments into opportunities for growth.

The conference offers twelve paper presentation, comprising two parallel and one general sessions, in which researchers present their projects and (first) results in a traditional way. We also have some ignite talks, in which researchers pitch their ideas in a specific format (20 slides in 5 minutes) to facilitate discussion. In addition, we have a session in which researchers present their ideas and projects in the form of interactive poster, requiring them to deliver a 5-minutes pitch. New this year, is a best poster prize, awarded to the person who excelled in the presentation of abstract, poster, pitch and discussion. The sessions are all conceived as to facilitate constructive discussions, where researchers and participants can exchange, inspire, and learn from one another.

The LuxERA General Assembly will take place on Wednesday 5<sup>th</sup> November 2025 at 5pm, followed by a small reception, where members and participants can mingle in a less formal setting.

Ineke M. Pit-ten Cate

LuxERA president  
University of Luxembourg, October 2025

## Conference Overview

| <b><u>Wednesday, 5 November 2025</u></b> |                                                |
|------------------------------------------|------------------------------------------------|
| 10h00 – 12h45                            | Check-In                                       |
| 10h30 – 12h00                            | Parallel Workshops I – III                     |
| 13h00 – 13h15                            | Welcome & Opening Words                        |
| 13h15 – 14h15                            | Keynote                                        |
| 14h15 – 14h45                            | Coffee Break                                   |
| 14h45 – 16h45                            | Parallel Paper and Ignite Talk Sessions I & II |
| 17h00 – 18h00                            | LuxERA General Assembly                        |
| 18h00 – 19h00                            | Reception                                      |

| <b><u>Thursday, 6 November 2025</u></b> |                                      |
|-----------------------------------------|--------------------------------------|
| 09h00 – 10h30                           | Interactive Poster Session           |
| 10h45 – 11h45                           | Parallel Paper Sessions III & IV     |
| 12h00 – 13h00                           | Fireside Chat Panel                  |
| 13h00 – 13h45                           | Lunch Break                          |
| 14h45 – 15h00                           | Paper Session V                      |
| 15h00 – 16h00                           | Best Poster Award & Concluding Words |

## Conference Schedule

### Wednesday, 5 November 2025

10h00 – 12h45 **CHECK-IN**  
In front of MSA  
3.520

### **Parallel Workshops I – III**

10h30 – 12h00

Workshop I  
MSA 3.160 **Inside Peer Review: Processes, Data, and Futures in Educational Research**

By Justin J. W. POWELL & Marcelo MARQUES

Workshop II  
MSA 3.120 **Exploring Innovative and Engaging STEAM Pathways through an Interactive Electronic Platform**

By Carole DORDING

Workshop II  
MSA 3.180 **Sustainability Board Game "Watt's the energy plan? De Lux. edition"**

By Louis KRIEGER & Sebastien ELIXANDER

13h00 – 13h15 **Welcome & Opening Words**  
MSA 3.520

13h15 – 14h15 **Keynote by Marcela POZAS, University of Luxembourg**  
MSA 3.520 **Rejected, Revised, Resubmitted: A Real Story of Academic Success**

## **Parallel Paper and Ignite Talk Sessions I & II**

14h45 – 16h45

Session I  
MSA 3.160

### **Policies & Practices in European Education**

Chaired by **Elif Tuğçe GEZER**

*Responses to Norm-divergent Health and Care Needs of Students in Education Systems where German is a major language of instruction: A Scoping Review*

Sophia Baesch

*Enabling School-to-work Transitions of Youth with Disabilities in Luxembourg: Contrasting Perspectives of Guiding Professionals*

Stephanie Da Gloria Soares, Lena Schürmann, Boris Traue & Justin Powell

*Understanding Policy Implementation through Coupling: A Typology for Educational Policy Analysis*

Simoes Loureiro, K.

*The Politics of Directionality in European Education and Training: 'Challenges' as Transnational Governance Devices in the European Universities Initiative and Centres of Vocational Excellence*

Agata A. Lambrechts, Marcelo Marques & Lukas Graf

Session II  
MSA 3.120

### **Developing Mathematical Thinking**

Chaired by **Carole DORDING**

*Spatial Abilities in Kindergarten Predict Arithmetic Skills in First Grade Beyond Prior Numeracy Knowledge*

Carrie Georges, Véronique Cornu & Christine Schiltz

*Understanding Collaborative Mathematical Problem-solving in Preschool Children Through Video-based Process Analysis*

Hoyeon Lee & Christine Schiltz

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        | <p><i>Units First or Tens first: How Home Language Affects Two-digit Auditory-visual Number Matching in Bilinguals</i></p> <p><u>Angélique Volfart, Andreia Borges &amp; Christine Schiltz</u></p> <p><i>Enhancing Mathematics Learning through Digital Environments in Luxembourg's Secondary Education</i></p> <p><u>Paul Ronald Klensch</u>, Robert A.P. Reuter, Christian Meyers, Gilbert Busana &amp; Yves Kreis</p> |
| 17h00 – 18h00<br>MSA 3.520             | <b>LuxERA General Assembly</b>                                                                                                                                                                                                                                                                                                                                                                                            |
| 18h00 – 19h00<br>in front of MSA 3.520 | <b>RECEPTION</b>                                                                                                                                                                                                                                                                                                                                                                                                          |

## Thursday, 6 November 2025

09h00 – 12h45  
in front of MSA 3.520

**REGISTRATION & COFFEE**

### Interactive Poster Session

09h00 – 10h30

Chaired by **Jennifer DUSDAL**

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| in front of MSA 3.520 | <p><i>The Necessity for a Diagnostic Tool for Developmental Language Disorder in Four- to Six-year-old Children in the Luxembourgish Multilingual Context</i></p> <p><u>Anissa Werdel</u>, Linda Romanovska, Caroline Hornung, Christine Schiltz, Kenan Starcevic &amp; Sonja Ugen</p> <p><i>Development of a New Test Battery to Diagnose Developmental Language Disorder in the Luxembourgish Multilingual Preschool Context</i></p> <p><u>Kenan Starcevic</u>, Caroline Hornung, Linda Romanovska, Christine Schiltz, Anissa Werdel &amp; Sonja Ugen</p> <p><i>Enhancing Students' Academic Language Competencies in German - An Intervention Programme</i></p> <p><u>Charlotte Krämer</u>, Sandra Baumann, Joanne Colling, Constanze Weth &amp; Sonja Ugen</p> <p><i>Bridging Learning Gaps in Mathematics: A Digital Approach</i></p> <p><u>Paul Ronald Klensch</u>, Christian Meyers, Robert A.P. Reuter,</p> |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Gilbert Busana & Yves Kreis

*Is Instructional Support that Supportive? A Second-order Meta-analysis of Factors Associated with Cognitive Activation in Classrooms*

Karen Krüger, Valentin Emslander, Anke Maria Weber, Ronny Scherer & Christoph Niepel

*The Challenges of Current CVI Profiling: A Closer Look at Neurovisual Function Coverage in Children – A Systematic Review*

Kim Ridell Di Lorenzo, Sonja Ugen & Pascale Esch

*Teaching by Class: A Systematic Review and Thematic Analysis of Teachers' Attitudes and Teaching Practices Towards Students from Different Socio-economic Backgrounds*

Josefine Hundt, Maria Fernanda Esqueda Villegas, Marcela Pozas, Susanne Schwab & Carmen Zurbriggen

*Young Carers in School*

Anne Stöcker, Anna-Maria Spittel, Steffen Kaiser, Gisela Schulze & Timo Lücke

## **Parallel Paper Sessions III & IV**

10h45 – 11h45

|                          |                                                                                                                                                                                                                                                                                                                     |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Session III<br>MSA 3.160 | <b>Needs Assessment for Inclusive Education</b><br>Chaired by <b>Sonja UGEN</b>                                                                                                                                                                                                                                     |
|                          | <i>Assessment Tools within MTSS Framework: Development Process and Implications for Luxembourgish School System</i><br><u>Raquelle Gebran</u> & Christophe Dierendonck<br><i>Mapping Needs to Inform Practice: a Collaborative Analysis of Language Education in Migration Contexts</i><br><u>Corine Philippart</u> |
| Session IV<br>MSA 3.120  | <b>Nonformal and Informal Learning Contexts</b><br>Chaired by <b>Sergei GLOTOV</b>                                                                                                                                                                                                                                  |
|                          | <i>Reception of Girls-Only Activities in the IT Sector – A Field Report</i><br><u>Christophe Stammet</u><br><i>Critical Review of Literature on Homeschooling Studies</i><br><u>Yana Nebolsina</u>                                                                                                                  |

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|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12h00 – 13h00<br>MSA 3.520             | <b>FIRESIDE CHAT PANEL</b> with Axel GRUND, Potheini VAILOULI, Sergei GLOTOV, and Ziwen TEUBER<br>Chaired by <b>Martha OTTENBACHER</b> and <b>Elif Tuğçe GEZER</b>                                                                                                                                                                                                                                                                                                                                                                                                            |
| 13h00 – 13h45<br>in front of MSA 3.520 | <b>LUNCH BREAK</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b><u>Paper Session V</u></b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 14h00 – 15h00                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| MSA 3.160                              | <b>Multilingual Literacy</b><br>Chaired by <b>Claudine KIRSCH</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                        | <i>Orthographic Processing in Bilinguals German–French Readers: Word Length and Word Superiority Effects</i><br><u>Gigleux Claire</u> & Lochy Aliette<br><i>Independent Contributions of Language and Media Exposure to Language and Literacy Acquisition in Luxembourg: Findings from a Large-scale Study</i><br><u>Lena M. Kaufmann</u> , Constanze Weth, Philipp Sonnleitner & Caroline Hornung<br><i>Home Language and the Relationship Between Phonological Awareness and Reading</i><br><u>Silke Marie Crols</u> , Linda Romanovska, Sonja Ugen & Ineke M. Pit-ten Cate |
| 15h30 – 16h15<br>MSA 3.520             | <b>BEST POSTER AWARD &amp; CONCLUDING WORDS</b><br>By <b>Ineke Pit-ten Cate</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Opening Keynote

### **Rejected, Revised, Resubmitted: A Real Story of Academic Success Academic**

**Prof. Dr. Marcela POZAS, University of Luxembourg**

Every researcher knows the thrill of submitting a manuscript, and the sting of rejection. For many emerging scholars, those early “no’s” can feel like the end of the road. But rejection is not failure; it’s part of the process. In this keynote, I will share my own journey as a researcher, including the many rejections I encountered, the lessons they taught me, and how persistence ultimately shaped my career. Together, we will explore how to reframe rejection as feedback, use revision as growth, and view resubmission as resilience in action. Success in academia is not about avoiding setbacks, it’s about navigating them with determination and resilience

## Workshops

## **Inside Peer Review: Processes, Data, and Futures in Educational Research**

**Prof. Dr. phil. Justin J. W. POWELL & Dr. Marcelo MARQUES**

Peer review is central to academic publishing, yet often opaque — especially for emerging researchers. This interactive 90-minute workshop combines up-to-date data on peer review in education and the social sciences with hands-on exploration of different review models, from traditional double-blind to open and collaborative formats. Participants will compare strengths and weaknesses, reflect on their own experiences, and practice giving constructive feedback. The session fosters critical discussion of challenges and innovations, equipping early-career scholars to navigate and contribute to peer review.

## **Exploring Innovative and Engaging STEAM Pathways through an Interactive Electronic Platform**

**Dr. Carole DORDING**

This workshop invites teachers and emerging researchers to explore creative and inclusive STEAM approaches. Using the Circuit Playground Express board, participants will engage in hands-on activities connecting maths, physics, music, and movement — such as the Skateboard Challenge, which combines balance, rhythm, and coding. Through playful experimentation and guided reflection, the session highlights the value of interdisciplinary collaboration in research and teaching. It offers innovative strategies to foster active participation, deepen conceptual understanding, and promote equity-driven learning, enabling early-career participants to integrate artistic and technological creativity into STEAM education and research.

## **Sustainability Board Game**

### **“Watt’s the energy plan? De Lux. edition”**

**Dr. Louis KRIEGER & Sebastien ELIXANDER**

Curious about how Luxembourg manages its energy and what it means for the future? Join us for an interactive board game by the Scienteens Lab, where you take on the challenge of building your city’s new energy grid. Experience real-world scenarios based on Luxembourg’s energy use and tackle issues of production, conversion, storage, and grid management. Can you meet your people’s needs and make it through the year? Whether you’re a strategy enthusiast or simply curious about energy management, this playful yet insightful session offers a fun way to explore one of today’s most pressing topics.

## Abstracts

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## **Responses to Norm-divergent Health and Care Needs of Students in Education Systems where German is a major language of instruction: A Scoping Review**

***Sophia Baesch***

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With school nursing not historically and comprehensively established across (majority) German-speaking countries (Kocks, 2023; Romberg et al., 2022), there is no central, usable knowledge base concerning health and care provision at school (Adenstedt et al., 2022). Accordingly, research on rights and needs of students with norm-divergent Health and Care Needs is scattered across several disciplines. Additionally, little research on the situation of students with chronic conditions in education systems where German is a major language of instruction is available (Seiler-Kesselheim & Walter-Klose, 2023). Accordingly, access to knowledge is limited or laborious for researchers and practitioners, alike. Meanwhile, growing numbers of youth with Special or Complex Health Care Needs attend schools (Allard et al., 2014; Lehr, 2020; Schlichting, 2009). Sparse research, subsequently, poses significant barriers to the implementation of two statutory commitments at once: access to quality healthcare and education for all, guaranteed by the *Convention on the Rights of Persons with Disabilities* (UN-CRPD, 2006) and the *Convention on the Rights of the Child* (UN-CRC, 1989). A scoping review on responses to norm-divergent health and care needs of students was, therefore, conducted. Databases from (Special) Education, (Paediatric) Nursing, Public Health, Childhood Studies, Sociology of Education, Inclusive Medicine and Psychology covering schooling in Austria, Germany, Luxembourg, and Switzerland were searched for peer-reviewed publications relevant to mutual access to quality healthcare *and* education of students through in-school care provision. Preliminary findings suggest 1) high dispersion and compartmentalisation of knowledge and research as a barrier to research-to-praxis-transfer and discursive connectivity; 2) marginalisation of norm-divergent care needs in the emergent profession of school (health) nursing; 3) particularisation and isolation of the collective body of students with norm-divergent care needs along medical diagnoses or SEN attribution; 4) excluding placement decisions, limited access to participation at school and educational segregation based on norm-divergent health and care needs.

### Keywords

*Inclusive Education, Special Health Care Needs, Chronic Illness, School Nursing*

### References

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- United Nations Convention on the Rights of the Child, November 20, 1989, <https://www.ohchr.org/en/professionalinterest/pages/crc.aspx>

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## **Enabling school-to-work Transitions of Youth with Disabilities in Luxembourg: Contrasting Perspectives of Guiding Professionals**

***Stephanie Da Gloria Soares, Lena Schürmann, Boris Traue & Justin Powell***

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As inclusion policies face increasing pushback, greater emphasis is placed on improving school-to-work transitions for youth with disabilities. However, what constitutes improvement and for whom remains contentious. This presentation draws on data from the comparative, multimethod PATH\_CH-Lux project (Luxembourg/Switzerland) to examine how social workers, career guidance services, special educational support staff and other actors, collaborate to support labour market integration, thereby reshaping professional roles (see Powell et al., 2024).

Since 2011, when it ratified the UN CRPD, Luxembourg has committed to reduce disability-specific disadvantages and strengthen education, social, political and labour market participation. However, challenges remain in aligning universal educational policies with specific needs of students with disabilities. The school-to-work transition remains a critical stage where systemic barriers hinder success (Blanck et al., 2023; Powell et al., 2024). Targeted support measures and specialized teams play a key role in guiding students through education, the transition to employment and adulthood.

This qualitative study triangulates data from a longitudinal panel of 30 young people with disabilities in Luxembourg and expert interviews with social workers and professionals. Elicitation methods, including vignettes (non-fictional scenarios based on panel data), provide deeper insights into the barriers, dynamics, and enabling factors shaping transitions.

Preliminary findings highlight the complex role social workers play in supporting school-to-work transitions. Positioned between student, familial, and institutional expectations, they must navigate emotionally demanding relationships while managing systemic constraints. Many serve as trusted mentors, particularly for students from disadvantaged backgrounds; a dynamic that fosters connection but blurs boundaries.

Social workers face the challenge of advocating for young people's competencies within systems that privilege formal qualifications. The presentation analyzes their triple role of direct support, gatekeeping, and advocacy, leading to complex multi-professional dynamics that influence disablement and labour market outcomes. The major research question focuses on how these actors mediate tensions within multi-professional teams to facilitate school-to-work transitions of youth with disabilities.

Keywords

Coupling theory, Policy implementation, Educational policy analysis, Plurilingual education, Early childhood education and care

References

- Simoes Loureiro, K. (2024). *Plurilingual education policy in early childhood education and care: Aiming towards more equal opportunities in Luxembourg*. Cham, Switzerland: Springer Nature Switzerland AG.
- Simoes Loureiro, K. and Hadjar, A. (2024). Facilitators and barriers to policy implementation: A mixed-method study on the plurilingual policy in Luxembourg. *European Educational Research Journal*, 1-28.
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## **Understanding Policy Implementation through Coupling: A Typology for Educational Policy Analysis**

***Kevin Simoes Loureiro***

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This presentation introduces a typology for educational policy analysis aimed at better understanding how implementation processes affect education policy outcomes. Grounded in Orton and Weick's (1990) multidimensional concept of coupling, the typology examines the relationship between policy goals and policy measures, focusing on the degree to which they are tightly or loosely linked across both policy design and practice levels. The central argument is that the degree of coupling established at the policy level significantly shapes implementation dynamics. Depending on how closely goals and measures are aligned, implementation can generate both intentional and unintentional effects in practice (Spillane et al., 2002). This analytical perspective is especially relevant in complex education systems, where diverse institutional actors and decentralized governance structures complicate coherent policy enactment (Simoes & Hadjar, 2024). Empirical evidence is drawn from a recent mixed-method study on the implementation of a plurilingual education policy in early childhood education and care (ECEC) within Luxembourg's non-formal sector (Simoes Loureiro, 2024). Based on expert interviews, policy document analysis, and a national online survey, the study identifies a range of implementation approaches – centralized, coordinated, communicative, flexible, interpretative, goal-oriented, and decentralized. These approaches demonstrate how varying degrees and forms of coupling influence how policy is understood, interpreted, and enacted by practitioners. The proposed typology provides both a conceptual and practical tool for researchers and policymakers to analyze how structural and discursive features at different levels interact to shape implementation processes. It contributes to broader educational research by offering a lens to assess how education policies are translated into everyday practice, revealing both challenges and opportunities in navigating systemic complexity.

Keywords

Coupling theory, Policy implementation, Educational policy analysis, Plurilingual education, Early childhood education and care

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- Simoes Loureiro, K. (2024). *Plurilingual education policy in early childhood education and care: Aiming towards more equal opportunities in Luxembourg*. Cham, Switzerland: Springer Nature Switzerland AG.
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## **The Politics of Directionality in European Education and Training: ‘Challenges’ as Transnational Governance Devices in the European Universities Initiative and Centres of Vocational Excellence**

*Agata A. Lambrechts, Marcelo Marques & Lukas Graf*

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This presentation introduces a typology for educational policy analysis aimed at better understanding how implementation processes affect education policy outcomes. Grounded in Orton and Weick’s (1990) multidimensional concept of coupling, the typology examines the relationship between policy goals and policy measures, focusing on the degree to which they are tightly or loosely linked across both policy design and practice levels. The central argument is that the degree of coupling established at the policy level significantly shapes implementation dynamics. Depending on how closely goals and measures are aligned, implementation can generate both intentional and unintentional effects in practice (Spillane et al., 2002). This analytical perspective is especially relevant in complex education systems, where diverse institutional actors and decentralized governance structures complicate coherent policy enactment (Simoes & Hadjar, 2024). Empirical evidence is drawn from a recent mixed-method study on the implementation of a plurilingual education policy in early childhood education and care (ECEC) within Luxembourg’s non-formal sector (Simoes Loureiro, 2024). Based on expert interviews, policy document analysis, and a national online survey, the study identifies a range of implementation approaches – centralized, coordinated, communicative, flexible, interpretative, goal-oriented, and decentralized. These approaches demonstrate how varying degrees and forms of coupling influence how policy is understood, interpreted, and enacted by practitioners. The proposed typology provides both a conceptual and practical tool for researchers and policymakers to analyze how structural and discursive features at different levels interact to shape implementation processes. It contributes to broader educational research by offering a lens to assess how education policies are translated into everyday practice, revealing both challenges and opportunities in navigating systemic complexity.

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## **Spatial Abilities in Kindergarten Predict Arithmetic Skills in First Grade Beyond Prior Numeracy Knowledge**

*Carrie Georges, Véronique Cornu & Christine Schiltz*

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A strong link exists between spatial and numerical abilities, but establishing a causal relation remains challenging due to limited longitudinal research and mixed findings from training studies. Moreover, there is little consensus on which spatial subdomains are most predictive at different developmental stages, as few studies have directly compared multiple spatial abilities or distinguished between different numerical outcomes while controlling for prior skills—especially in early education. Recent findings suggest that spatial abilities are particularly important for newly acquired and difficult arithmetic skills, such as multiplication and division, rather than addition and subtraction, in third grade. To further test this, the present longitudinal study on 148 children examined the predictive effects of three spatial subdomains—intrinsic static, intrinsic dynamic, and extrinsic static abilities—assessed in kindergarten, on the acquisition of addition and subtraction in first grade. The analysis controlled for sociodemographic factors (age, gender, SES), phonological awareness, and prior numerical knowledge. Hierarchical multiple linear regression analyses revealed that spatial abilities, along with backward counting, were significant predictors of first-grade arithmetic skills. Specifically, intrinsic dynamic spatial ability was associated with better addition performance, while extrinsic static spatial ability played a key role in subtraction. Conversely, (non-)symbolic magnitude comparisons, phonological awareness, and sociodemographic variables were not significantly related to arithmetic skills when spatial abilities were accounted for in the final step. These findings confirm the general importance of spatial abilities for arithmetic development in first grade, highlighting their role as a scaffold for newly acquired skills. They also reveal qualitative differences in how specific spatial subdomains influence addition and subtraction, providing insights for targeted educational interventions in kindergarten aimed at enhancing mathematical abilities at the beginning of formal schooling.

### Keywords

*Kindergarten, first grade, arithmetic, spatial abilities, longitudinal*

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## Understanding Collaborative Mathematical Problem-solving in Preschool Children Through Video-based Process Analysis

*Hoyeon Lee & Christine Schiltz*

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Collaboration of preschool children can play a positive role in improving basic cognitive skills, such as card sorting, perspective taking, and rule understanding. Yet, less is known regarding the social interaction that occurs during the collaboration process and how it supports individual's improvement in cognitive skills.

A previous study (Lee & Schiltz, in preparation) indicated that preschool children achieved better performance when solving complex mathematical problems with a partner than alone. Moreover, performance in problem solving was also related to the pre-mathematical skills score. However, during collaboration, children's performance was independent of the interplay between the child's and the partner's pre-math skills scores. These findings suggest that the observed improvement in complex mathematical problem-solving is independent of children's pre-math skills scores but may stem from aspects of social interaction, such as problem-solving related behaviors.

Using video-recorded data, this study aims to investigate potential behavioral characteristics related to the pair working condition to specify the supporting role of social interaction in mathematical problem solving. A total of 109 children were assigned to either an individual or collaborative problem-solving condition. Two video-recorded sessions were conducted, one focused on spatial abilities and the other on numerical abilities. Separate linear mixed models revealed that children performed better in both tasks when working in pairs. In the spatial task, the pair group outperformed the individual group (estimated difference = 0.73, SE = 0.30,  $p = .018$ ; adjusted means = 1.24 vs. 0.51), and boys scored higher than girls (difference = -1.11, SE = 0.23,  $p < .001$ ). In the numerical task, the pair group again showed higher performance (difference = 1.72, SE = 0.36,  $p < .001$ ; means = 3.10 vs. 1.38). Further analysis of problem-solving behaviors based on video-recorded data will follow.

Keywords

*Peer collaboration, problem solving, preschool children, numerical cognition*

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## **Units First or Tens first: How Home Language Affects Two-digit Auditory-visual Number Matching in Bilinguals**

*Angélique Volfart, Andreia Borges & Christine Schiltz*

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Previous literature suggests that speaking multiple languages greatly affects performance at numerical tasks. However, it remains unclear how the home language (HL) interacts with numerical performance in the two languages of mathematical instruction in Luxembourg (LM1 German switching to LM2 French).

In this online study, adult participants with Luxembourgish (n=29) or Portuguese (n=45) HL were presented with an auditory German (LM1) or French (LM2) two-digit number word and asked to match it with its corresponding arabic digit form under simultaneous or sequential conditions.

Our results show that, while Luxembourgish HL displayed a typical advantage of LM1 over LM2 in response times, Portuguese HL performed equally fast in both languages in the sequential conditions. Moreover, Portuguese HL made significantly more errors in German than in French while Luxembourgish HL performed similarly in the two languages.

These results highlight the crucial role of HL and its linguistic structure on numerical performance.

### Keywords

*number transcoding; online study; home language; language of mathematical instruction*

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## Re-enchanting mathematics: Motivation and digital learning in Luxembourg's secondary education

*Paul Ronald Klensch, Christian Meyers, Robert A.P. Reuter, Gilbert Busana, Yves Kreis*

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This presentation introduces a PhD research project that explores how mathematics learning in Luxembourg's secondary education can become more engaging, motivating, and effective, particularly through digital environments and innovative pedagogies. Luxembourg aims to enhance teaching and learning practices by integrating digital media across all school levels. At the same time, the curriculum is evolving to promote 21st-century skills, including computational thinking and AI literacy (SMC, 2023). The central research question guiding this project is: *How can digital environments and innovative pedagogical approaches re-enchant mathematics learning for secondary students in Luxembourg?*

The project investigates three interconnected directions, each emphasizing motivation and the role of digital environments.

The first direction focuses on remediation and assessment. It examines how digital tools can transform traditional summer remediation into a continuous, formative, and feedback-driven learning experience. This approach addresses disengagement and inequities that often arise from current remediation and assessment practices.

The second direction explores STEAM and coding, investigating how project-based learning, coding, and technology can foster intrinsic motivation. Digital environments allow students to experiment, engage in trial-and-error learning, and receive real-time feedback. These experiences connect creativity, computational thinking, and mathematics in ways that promote autonomy, curiosity, and deep engagement.

The third direction considers competitions and challenges. It studies how playful, curriculum-aligned competitions can leverage extrinsic motivation to reinforce intrinsic engagement. By participating in challenges such as *OMB*, *MaachMath*, *MathleTIC*, *First Lego League*, or other competitions, students develop problem solving skills and sustain motivation across the classroom.

Across the three directions, the project anticipates several outcomes. Students are expected to demonstrate increased motivation, engagement, and mathematical understanding. Digital environments are anticipated to support equity by providing personalized learning paths and immediate feedback, while fostering a culture of curiosity and continuous learning. The combination of intrinsic and extrinsic motivation is expected to strengthen both cognitive and metacognitive competencies.

This design-based research project aims to provide evidence on how digital environments and

innovative pedagogies can reshape mathematics education in Luxembourg. By integrating remediation, STEAM, and competitions into a coherent framework, the study seeks to inform educators, policymakers, and researchers on strategies to enhance learning experiences, support students at risk, and cultivate a sustainable culture of engagement in mathematics. Feedback from the LuxERA community will help to refine the project's focus, and its potential educational impact.

#### Keywords

*mathematics, education, digital, learning, environment*

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<https://smc.gouvernement.lu/en/service/innovative-initiatives.html> abgerufen

## The Necessity for a Diagnostic Tool for Developmental Language Disorder in Four- to Six-year-old Children in the Luxembourgish Multilingual Context

Anissa Werdel <sup>a</sup>, Linda Romanovska <sup>a</sup>, Caroline Hornung <sup>a</sup>, Christine Schiltz <sup>b</sup>, Kenan Starcevic <sup>a</sup>, Sonja Ugen <sup>a</sup>

Developmental Language Disorder (DLD) is diagnosed when a child demonstrates persistent difficulties with vocabulary, phonology, morphology, syntax, and spoken communication across all used languages (Bishop et al., 2017), in the absence of a broader developmental disorder (McGregor Karla K. et al., 2020). In Luxembourg, where many children have a first language (L1) other than Luxembourgish, it is essential to avoid over-identifying these children and under-identifying children with Luxembourgish as their L1, to ensure access to appropriate support. However, diagnostic challenges persist due to a lack of test materials that reflect Luxembourgish grammar and vocabulary, and the absence of reference norms calibrated to the local multilingual preschool population. The poster will be a literature-based review of the adapted German language diagnostic tests that are currently used to assess children in Luxembourgish. It will delineate their unsuitability for the Luxembourgish context and demonstrate the need for a new standardized and normed test battery for the assessment of children's Luxembourgish language skills.

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### Keywords

*developmental language disorder, Luxembourgish grammar skills, early detection, diagnostic tools, multilingual context*

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## **Development of a New Test Battery to Diagnose Developmental Language Disorder in the Luxembourgish Multilingual Preschool Context**

***Kenan Starcevic<sup>a</sup>, Caroline Hornung<sup>a</sup>, Linda Romanovska<sup>a</sup>, Christine Schiltz<sup>b</sup>, Anissa Werdel<sup>a</sup> & Sonja Ugen<sup>a</sup>***

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Diagnosing developmental language disorder (DLD) requires a thorough assessment of children's oral language skills in the main instruction language. However, this is complicated due to an absence of appropriate tests taking children's home language(s) into account in a multilingual country, where 68,4 % of children speak another language at home than the instructional language in preschool (Luxembourgish). Diagnosing DLD fairly in Luxembourgish requires adapted reference norms according to the home language spoken (see Werdel et al., 2025) and a test reflecting the uniqueness of Luxembourgish grammar.

Therefore, a novel test battery is being developed to assess four to six-year-old's morphological and syntactic abilities in Luxembourgish. Based on theoretical models, the battery will include subtests assessing six oral language domains: plural, grammatical gender congruency, grammatical case, subject-verb-congruency and verb-second placement and finally verb-end placement. The poster will contain an overview of the test framework, method and procedure.

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### **Keywords**

*developmental language disorder, test development, Luxembourgish grammar skills, diagnostic tools, multilingual context*

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## **Enhancing Students' Academic Language Competencies in German - An Intervention Programme**

*Charlotte Krämer, Sandra Baumann, Joanne Colling, Constanze Weth & Sonja Ugen*

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National and international studies report a high number of secondary school students struggling with understanding and using the language of instruction (Boehm et al. 2016; Hornung et al. 2021). Results of the national school monitoring point in the same direction: Even one in five high-achieving students is challenged by reading comprehension tasks (<https://dashboard.epstan.lu>). Furthermore, teachers report that these challenges affect their students' ability to express themselves in content-subjects (e.g. sciences).

To address these difficulties, we are collaborating with teachers to develop an intervention programme for 8<sup>th</sup> graders aiming to enhance academic language competencies in German in 3 key areas: (1) grammar, (2) reading, and (3) writing.

In 2025-26, the programme will be scientifically evaluated at three time points through a mixed-methods design that encompasses standardized achievement tests, student questionnaires and qualitative classroom observations. The aim is to evaluate the effectiveness of the intervention programme and to foster language-sensitive pedagogical practices.

### Keywords

*Academic language, multilingualism, language support, secondary education, intervention study*

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## Bridging Learning Gaps in Mathematics: A Digital Approach

*Paul Ronald Klensch, Christian Meyers, Robert A.P. Reuter, Gilbert Busana & Yves Kreis*

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This poster explores a digital alternative to traditional remediation, aiming to bridge learning gaps through formative, adaptive, and feedback-driven practices. In Luxembourg's classical secondary education, 8.4% of students were assigned mandatory summer remediation tasks in the 2021/2022 school year, and more than half of them (53.2%) failed even after remediation (MENJE, 2023). These figures raise an urgent question: how can remediation better support students who are already struggling in mathematics?

The current system often relies on extensive, paper-based summer assignments completed without meaningful feedback or teacher guidance. Such practices risk reinforcing existing inequalities and disengagement rather than fostering recovery and growth.

This poster presents a digital approach to rethink remediation in a more formative, adaptive, and feedback-oriented way. One possible alternative is the use of a national, curriculum-aligned digital learning environment that enables students to engage with interactive exercises, receive real-time feedback, and track their progress over time. The goal is to strengthen core mathematical understanding while fostering autonomy, self-confidence, and learning at their own pace. Preliminary observations from lower secondary classes indicate positive student engagement and motivation when using the national digital tool *MathemaTIC* (Park, 2015).

### Keywords

*mathematics, education, digital, tools, remediation*

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## Is Instructional Support that Supportive? A Second-order Meta-analysis of Factors Associated with Cognitive Activation in Classrooms

*Karen Krüger, Valentin Emslander, Anke Maria Weber, Ronny Scherer & Christoph Niepel*

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High instructional quality is consistently and positively related to students' outcomes such as achievement and motivation. To capture instructional quality, researchers have developed various frameworks with differing conceptualizations and operationalizations of “quality”. These frameworks comprise different components of teaching. Besides classroom management and the student-teacher relationship, one common key component of instructional quality is cognitive activation (CA, Klieme et al., 2009). CA focuses on facilitating engaged learning and deeper understanding of learning content. In other common frameworks, this component of teaching is labeled as instructional support or cognitive demand. Due to the variability in the conceptualization of CA, research on it is fragmented, hampering an overall understanding of CA’s educational value. To address this gap, this second-order meta-analysis synthesizes existing meta-analyses about CA and its role in instructional quality frameworks. Following PRISMA guidelines and using SPIDER-based inclusion criteria, we search grey literature and the databases Education Research Complete, ERIC, PsycINFO, Scopus, and Web of Science for meta-analyses on CA in educational contexts. The aim is to quantify the overall effect of CA on teaching-related outcomes, to provide an overview over the state of research and facilitate discussions on CA and its underlying frameworks.

### Keywords

*Cognitive Activation, Instructional Quality, Teaching Quality, Meta-Analysis*

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## **The Challenges of Current CVI Profiling: A Closer Look at Neurovisual Function Coverage in Children – A Systematic Review**

***Kim Ridell Di Lorenzo, Sonja Ugen & Pascale Esch***

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Cerebral Visual Impairment (CVI) is characterised by a wide and heterogeneous range of visual processing deficits. This heterogeneity poses a significant challenge to developing standardised diagnostic guidelines, resulting in inconsistencies across clinical, educational, and research contexts. This systematic review aims to synthesise current research on CVI profiles. Specifically, it will identify which visual and neurovisual functions are assessed, determine how frequently these functions are evaluated, and explore whether they are grouped into broader constructs. A systematic search will be conducted in PubMed, CINAHL, ERIC, PsycINFO, and Web of Science. Eligible studies will include children aged 3 to 18 years diagnosed with CVI and provide details of assessment procedures and targeted functions. The review will generate an overview of functions assessed in CVI, identify emerging profiles, and potentially inform the development of more consistent, evidence-based diagnostic practices and tools to better support children with CVI.

### Keywords

*CVI, Cerebral Visual Impairments, Cortical Visual Impairments, Profile*

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## **Teaching by Class: A Systematic Review and Thematic Analysis of Teachers' Attitudes and Teaching Practices Towards Students from Different Socio-economic Backgrounds**

***Josefine Hundt, Maria Fernanda Esqueda Villegas, Marcela Pozas, Susanne Schwab & Carmen Zurbriggen***

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The increasing diversity of today's student body underscores the need for inclusive education that supports every learner's potential and participation (Maulana, 2020; Schwab, 2020; UNESCO, 2017). At the same time, the persistent underachievement of students from low socio-economic backgrounds (SEB) compared to more advantaged peers (OECD, 2023) highlights enduring educational inequalities and the need for teaching that addresses socio-economic diversity. Teachers' attitudes are pivotal, shaping instructional practices (Schwab & Alnahdi, 2020; Baumert & Kunter, 2006). Research indicates that teachers often hold less favorable beliefs (Vantieghem et al., 2023), attitudes (Pit-ten Cate & Glock, 2018), and expectations (Sneyers et al., 2020) toward students from low SEB. Therefore, the study explores teachers' attitudes and differences in teaching practices toward students from diverse SEB. A systematic literature review following PRISMA guidelines and thematic synthesis (Thomas & Hardens, 2008; Braun & Clarke, 2006) was conducted. Literature was retrieved from field-relevant databases, including EbscoHost (PsycINFO, ERIC) and PubMed. Search terms covered three sub-topics: (1) teacher attitudes and synonyms, (2) students' socio-economic background, and (3) inclusive teaching practices. Sixteen qualified empirical studies were included for thematic synthesis.

Findings indicate three clusters of teacher attitudes: (1) biased, (2) aware and trying, and (3) embracing, and three corresponding practice types: (1) exclusive, (2) ability-centered, and (3) inclusive. A thematic matrix revealed that biased attitudes frequently co-occurred with exclusive or ability-centered practices. Similarly, aware-and-trying attitudes often aligned with ability-centered approaches, while embracing attitudes corresponded with inclusive practices. Notably, several studies reporting embracing attitudes in combination with inclusive practices were conducted in lower-SES school contexts or within teacher training settings. Implications and limitations are discussed within the study.

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## Young Carers in School

*Anne Stöcker*

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Young carers are children and adolescents who assume regular caregiving responsibilities for family members with illness, disability, or addiction. They face educational challenges such as emotional distress, absenteeism, lack of recognition in school contexts, and reduced academic performance (Carers Trust, 2024; Dearden & Becker, 2002; Kaiser, 2019). In some countries (e.g., the United Kingdom) research is well established and specific support structures have been implemented. In contrast, German-speaking countries, including Germany and Luxembourg, have only a few pioneering studies and no systematic educational responses, leaving this group – estimated more than 5 % of students (Metzing, 2022) – largely unrecognised (Leu & Becker, 2017). To our knowledge, the specific link between young carers and educational disadvantage has not yet been synthesised in a systematic review. Our project addresses this gap by reviewing English- and German-language studies on young carers and education, focusing on processes, outcomes, barriers, and success factors. The topic is especially relevant for Luxembourg, where multilingual schooling and social diversity create additional challenges; in such a setting, hidden disadvantages like caregiving responsibilities may further limit educational participation.

### Keywords

*Young carers, school, educational disadvantage, inclusion, caregiving youth*

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## **Assessment Tools within MTSS Framework: Development Process and Implications for Luxembourgish School System**

***Raquelle Gebran & Christophe Dierendonck***

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Late interventions, grade repetition, and sometimes school dropout: these are undesirable decisions and consequences for students experiencing academic failure (Galand, Lafontaine, Baye, Dachet & Monseur, 2019). In response to these concerning practices, research shows that learning difficulties appear well before formal education begins, and that early interventions could prevent school failure (Karoly, Kilburn, & Cannon, 2005).

To prevent and address learning difficulties from early childhood and promote the success of all students (Clarke et al., 2016; Vaughn, Wanzek, Woodruff, & Linan-Thompson, 2007), the MTSS approach was developed.

The Multi-Tiered System of Supports (MTSS) is an organizational and pedagogical approach aimed at preventing academic difficulties through effective teaching for all students and intensive, targeted interventions for those at risk of failure (Desrochers, 2021). It is characterized by evidence-based pedagogical interventions (De Chambrier & Dierendonck, 2022) and the early detection of learning difficulties through the administration of scientifically validated standardized tests (Dierendonck, 2020).

The first part of this presentation will briefly introduce the MTSS approach through the lens of different types of assessments used for student screening, diagnosing difficulties, and monitoring progress (Desrochers, Favier, Ramus & Ziegler, 2025) in literacy.

The second part will propose a guide for developing assessment tools within an MTSS framework. This guide will be based on a real design and development process carried out as part of the MTSS-K project (Multi-Tiered System of Support at Kindergarten).

We conclude with a reflection on how this research could be beneficial for the Luxembourgish school system.

### Keywords

*Multi-tiered System of Supports (MTSS), assessment tools, kindergarten, Luxembourgish school system.*

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## **Mapping Needs to Inform Practice: a Collaborative Analysis of Language Education in Migration Contexts**

*Corine Philippart*

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In language education across Europe, action-oriented approaches are widely promoted. These approaches emphasize learner-centered environments, encouraging teachers' responsiveness to consider students' profiles, expectations, and aspirations (Council of Europe, 2001, 2020). However, the growing superdiversity of classrooms makes this task increasingly complex: teachers are expected to design instruction that is both tailored to a group and sensitive to the individual needs of each member of this heterogeneous cohort (Vertovec, 2022; Vienneau, 2002). In response to this triple challenge, the present study explores how teachers could support all learners equitably by intentionally prioritizing certain pedagogical strategies.

Conducted in the highly international and multicultural context of the University of Luxembourg's Language Centre (Eurostat, 2024), the research focuses on the needs of three learner groups: incoming exchange students participating in international mobility programs, and foreign students residing in Luxembourg following either voluntary or forced migration. Using a collaborative mixed-method approach called Group Concept Mapping, the discussions do not simply reflect *on* these learners, but rather engage *with* them (Rosas, 2017). More specifically, the communities involved in adult learning and teaching – language teachers, staff members, learners and program directors – were invited to identify, discuss, and/or refine the language learning needs of adult migrants with past formal education (Kane & Rosas, 2018).

Through this process, which took the form of a cluster map analysis, 12 action domains were identified. A transversal reading of these domains highlights the ongoing structuring effort required to balance material and infrastructural aspects, such as access to educational resources and institutional learning environments, with more human dimensions. It also underscores the emotional role of language teachers in learning dynamics, the learners' need for a welcoming and warm learning community, and the importance of personal commitment to foster a meaningful learning experience for all.

Keywords

*Language learning needs; adult migrants; group concept mapping; cluster map*

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## Reception of Girls-Only Activities in the IT Sector – A Field Report

*Christophe Stammel*

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Motivating girls to explore IT careers demands innovative outreach strategies. This presentation reports on "Girls in IT," a pilot initiative by the Scienteens Lab targeting secondary school girls in Luxembourg through nine extra-curricular, girls-only sessions designed to introduce concepts of computer science and technology via engaging, hands-on activities. With 140 participants across diverse schools, we collected qualitative and quantitative feedback to evaluate reception and impact. Our analysis reveals very positive responses, highlighting how a girls-only approach fosters interest and confidence in IT. A notable result is the effect of participant remuneration, influencing initial motivation for some and leading to genuine engagement and positive shifts in perception.

Looking ahead, this presentation will explore the possibilities of creating outreach content while presenting the challenges when faced with highly heterogeneous groups, across a wide age span (12–19) and a spectrum of prior experience, from complete beginners to participants with existing coding interests. We will discuss how differentiated formats, topic selection, and creating of hands-on activity can address these diverse needs and what this means for the possibilities of girls-only IT initiatives. The findings support the value of tailored, inclusive educational formats to better engage underrepresented groups, while raising interesting questions for educators and researchers about effectively reaching and inspiring a broad range of learners.

### Keywords

*IT and technology, girls in IT, STEM in education, gender diversity*

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## Critical Review of Literature on Homeschooling Studies

*Yana Nebolsina*

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In the context of growing interest in alternative educational practices, homeschooling has emerged as a complex and contested phenomenon. A considerable amount of literature has been published on homeschooling (Mazama & Lundy, 2012; van Schalkwyk & Bouwer, 2011; Lois, 2013). Several lines of evidence suggest that parents often perceive homeschooling as a way to align their children's education with their cultural values, avoid external influences, and liberate themselves from traditional educational structures. This enables them to provide a tailored education that addresses specific needs and fosters a love of learning. This review critically examines the literature on homeschooling in various settings to identify key debates, methodological trends, theoretical developments, and research gaps. The review encompasses empirical studies published between 2010 and 2025, using the keywords 'homeschooling', 'home school', and 'home education'. All selected articles were analysed regarding their research objectives, participants, data collection and analysis methods, research findings, theoretical framework, focus or issues identified, and contradictions. A thematic analysis was conducted to map how key concepts, such as parents' beliefs about education, upbringing, and schooling, as well as their coping strategies and homeschooling practices, are framed across different studies. Findings reveal a strong emphasis on the significance of religion within parents' beliefs related to values and schooling; however, limited attention is given to families without a religious background. The literature also tends to prioritise special educational needs (Jolly, Matthews & Nester, 2012; Hurblutt, 2012), overlooking ordinary homeschooling children. While studies consistently emphasise parents' motivations to homeschool their children, they often neglect the homeschooling practices, specifically what parents do and how they interact with their children. Moreover, there is a notable gap in research addressing the lived experiences of multilingual children in homeschooling settings, particularly in non-Anglophone contexts. The insights gained suggest the need for more inclusive, practice-oriented, and context-sensitive research that extends beyond parental motivations to explore the everyday realities of homeschooling, particularly among secular and multilingual families in underrepresented settings.

Keywords

*homeschooling, teaching strategies, learning strategies, child-rearing and education beliefs*

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## Orthographic Processing in Bilinguals German–French Readers: Word Length and Word Superiority Effects

*Gigleux Claire & Lochy Alette*

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The Word Superiority Effect (WSE), as a marker of automatic orthographic processing, demonstrates a faster and more accurate letter identification when embedded in words compared to pseudowords or non-words. The Word Length Effect (WLE), observed in reading aloud tasks, reflects the influence of sublexical decoding, whereby longer words generally require more processing time. This study investigates how the two effects are modulated by language transparency and readers' proficiency in a group of twenty-six bilingual adults, thereby shedding light on visual word recognition in the Luxembourgish context (typically L1-German and L2-French).

The Word Superiority Effect (WSE) appeared in both languages, though it showed different patterns. In German, the participants' first reading language with a transparent orthography, the WSE emerged in both accuracy and reaction times, indicating automatic and efficient lexical processing. In French, their second reading language with an opaque orthography, the WSE was only found in reaction times. A qualitative contrast emerged in the Word Length Effect (WLE). Reading aloud in German was influenced by phonological length (i.e. syllable count), whereas it was driven by orthographic length (i.e. number of letters) in French.

So far, our results highlight the impact of orthographic transparency and language proficiency on written word processing and will be further clarified by upcoming data from a French monolingual control group.

### Keywords

*Bilingualism, Word Length Effect, Word Superiority Effect, Grain - Size Theory, Orthographic Depth Hypothesis*

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## Independent Contributions of Language and Media Exposure to Language and Literacy Acquisition in Luxembourg: Findings from a Large-scale Study

*Lena M. Kaufmann, Constanze Weth, Philipp Sonnleitner & Caroline Hornung*

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The present study examined how exposure to the language of instruction and media in a diverse multilingual cohort of Luxembourgish first graders in 2023 was associated with language and early literacy skills in the language of instruction. The study included three different home language groups, from children only speaking the languages of instruction (Luxembourgish and German) with their parents (MonoLI,  $n = 1,577$ ), over children speaking additionally another language with their parents (MultiLI,  $n = 3,098$ ) to children not speaking the languages of instruction with their parents (NonLI,  $n = 958$ ). A complex picture of language exposure in the multilingual context in Luxembourg emerged in descriptive investigations of large-scale school monitoring data. Additionally, linear regression analyses indicated that exposure to the language of instruction at home was positively associated with Luxembourgish listening comprehension and early literacy for all language groups, even while controlling for socioeconomic status and media exposure. Preschool attendance was only positively associated with language and early literacy in NonLI children. Higher frequency of book exposure, irrespective of the used language, was significantly associated with higher language and literacy scores for nearly all home language groups. Video frequency was unrelated or negatively related to performance, depending on outcome and language group, while audio frequency was mostly unrelated to both language and literacy skills for the different home language groups. Results point towards an independent impact of exposure to both language and early literacy activities in multilingual student populations. This highlights the important role that the home language and literacy environment plays in fostering children's literacy acquisition.

### Keywords

*preschool attendance, media exposure, language exposure, early literacy, listening comprehension*

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## Home Language and the Relationship Between Phonological Awareness and Reading

*Silke Marie Crols, Linda Romanovska, Sonja Ugen & Ineke M. Pit-ten Cate*

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A challenge for beginning readers is learning grapheme-phoneme correspondences<sup>1,2</sup>, which requires recognizing letters and linking them to sounds, supported by phonological awareness. Research indicates that reading and phonological awareness<sup>3,4</sup>, are associated in children speaking the language of literacy instruction at home<sup>5,6</sup>. However, it is unclear if this applies when children learn to read in a language other than their home language<sup>7</sup>.

This is particularly relevant in Luxembourg, where children typically learn to read in German, but only 34% of children speak German or the closely related Luxembourgish at home<sup>8</sup>. Limited exposure to German or Luxembourgish may hinder phoneme discrimination affecting phonological awareness and in turn reading ability<sup>9</sup>.

This study examined whether the relationship between phonological awareness and reading varied by home language. We expected a stronger relationship for children exposed to Luxembourgish or German at home than for others. The sample included 664 children across all 15 Luxembourgish school districts who received 2 years of German literacy instruction (grade 3.1) and completed measures of phoneme deletion and German (non)word reading accuracy. 288 children spoke Luxembourgish or German at home. Results of linear regression analyses revealed that although phonological awareness and home language explained 23% of variance in word reading and 19% in nonword reading, the interaction effect was not significant.

Contrary to expectations, the strength of the association between phonological awareness and reading was similar in both language groups. It could be that if children have been enrolled in the Luxembourgish school system since kindergarten, they all establish a similar relation between phonological awareness and reading in German. Another explanation may be that in the multilingual context of Luxembourg, all children are to some extent exposed to other languages than the language of literacy instruction, which results in comparable relationships between phonological awareness and reading across all children.

### Keywords

*Luxembourg, phonological awareness, reading, language, primary school*

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