BOOK OF ABSTRACTS

THE 9TH INTERNATIONAL DESIGNS FOR LEARNING CONFERENCE

DESIGNING FOR PARTICIPATION & ENGAGEMENT

LOCATION: STOCKHOLM UNIVERSITY

24-26 AUGUST 2026

Welcome to DFL 2026!

Welcome to the 9th International Designs for Learning conference, 24–26 August 2026, at the Department of Education, Frescati, Stockholm University.

This year's theme is Designing for participation and engagement in the contemporary landscape. The conference uses the concept of design as a starting point to explore participation and engagement in relation to critical global challenges such as sustainability, democracy, peace, equality, and rapid technological change—both within and outside formal education. The focus is on designers for learning (such as students, educators, museum curators, educational leaders, and policymakers) in shaping these landscapes. These stakeholders need to navigate a complex environment where education, learning, and knowledge are constantly evolving due to technological advancements and innovative approaches.

Contact information:
eva.insulander@edu.su.se
anna.akerfeldt@su.se

Conference commitee:
Eva Insulander
Anna Åkerfeldt
Fredrik Lindstrand
Susanne Kjällander
Staffan Selander
Eva Svärdemo Åberg
Ola Knutsson

DFL

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KEYNOTE ABSTRACTS

Researching professional learning in digital transformation: Shifting the gaze in co-design activities

Åsa Mäkitalo

Professor of Education, Department of Education, Communication and learning, University of Gothenburg

When studying professional learning in response to digital transformation, one needs to be analytically sensitized to challenges professionals face. Such challenges are intrinsic to situated premises and practices - their interdependencies and contingencies. What is considered relevant to know and learn is currently contingent on shifting dynamics of tools, activities, practices and accountabilities with stakes spanning organisational contexts. As a researcher this may require analytical shifts in ongoing co-design, to learning as situated in dialogical tensions spanning contexts and material arrangements.

In my keynote I will exemplify shifts in the dynamics of tools, activities and practices and argue for co-design as emerging form of joint exploration and articulation of what matters that enables sustained response-ability in professional practice as the future embarks on the present.

When and where: 24th of August 13:10 Lilla hörsalen, The Swedish Museum of Natural History

Designs for disruption and participation: Tales from the educational landscapes of Sweden, Seychelles and South Africa

Anders Björkvall

Professor of Swedish language, School of Humanities, Education and Social Sciences, Örebro University

Education globally is undergoing significant transitions. These transitions are of different types – and they sometimes move in different directions – but they always affect designs for and in learning (Selander, 2022) in the various contexts. Further, it is often argued that countries like Sweden and many countries of the African continent face totally different educational challenges, which to some extent is true. However, collaboration is also called for (Borrell, 2021), for instance, with regard to the UN Sustainable Development Goals around inclusive education at all levels. In my presentation I will focus on examples of designs for learning across the global North and South that have the potential to increase participation. More specifically, the aim is to theorize and discuss educational and semiotic designs for increased participation in contexts of digitalization and de-digitalization of schools and more broadly in higher education.

Theoretically and methodologically, the presentation draws on insights from Multimodal Ethnography (Björkvall, 2012; Flewitt, 2011) – which combines ethnographic perspectives on, for instance, pedagogical practice with social semiotic perspectives on meaning-making (Kress, 2011) – as well as insights from the Designs for Learning approach (Selander, 2022). One key theoretical assumption is that widening participation and inclusion can be substantially promoted by (re)designing the genres and practices of education. The flip side of this coin is also discussed: that inclusion for many often excludes some (learners). I will here draw on examples from the project Inclusive participation in higher education: A multimodal genre perspective from Sweden and South Africa (IpSSA) which investigates semiotic principles for inclusive design of teaching and learning in Sweden and South Africa. Another theoretical assumption underpinning my presentation is that unnecessary dichotomies in education can be reduced through strategic uses of boundary objects (Star and Griesemer, 1989), connecting domains that were previously separated, such as digital and analogue domains in education. Here, I draw on the DigiPen project (Connecting digital and analog literacy: The potential of the digital pencil for text creation in school), which analyzes the use of digital pencils in processes of de-digitalization (in Sweden) and digitalization (with Seychelles as main example).

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Björkvall, A. (2012). 'Artefakters betydelsepotentialer: En presentation av den sociosemiotiska etnografin som teori och metod'. In Nordisk socialsemiotik: pædagogiske, multimodale og sprogvidenskabelige landvindinger, T.Hestbæk Andersen and M.Boeriis (eds.). Odense: Syddansk Universitetsforlag.

Borrell, J. (2021). Africa and Europe: In the face of common opportunities and challenges, let's build common responses. European Union External Action. https://www.eeas.europa.eu/eeas/africa-and-europe-face-common-opportunitiesand-challenges-lets-build-common-responses_en.

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When and where: 25th of August 11:00 Lilla hörsalen, The Swedish Museum of Natural History

Research as Play: Designing Multimodal Methodologies for Research with Young Children

Kate Cowan

Honorary Senior Research Fellow at UCL's Institute of Education (IOE)

Research with young children can present a range of methodological challenges including involving them meaningfully in the research process and facilitating their authentic communication with researchers. This talk will share experiences of designing and conducting playful ethnographic research with young children that is participatory, giving children an active and agentive role in co-creating data, and multimodal, where communication is understood as involving multiple modes beyond language.

Framed within a multimodal social semiotic theory of communication (Kress 2009), this approach will be illustrated with examples from three projects researching children's contemporary play practices in a digital (or, arguably, post-digital) age. Firstly, 'Playing the Archive', which included an ethnographic study exploring the playground play of children aged 5-11 in two London primary schools using a wide range of creative methods such as drawing, map-making, child-to-child interviews and video recordings of various kinds. Secondly, from 'The Play Observatory', a subsequent project studying the play experiences of children aged 0-18 throughout the Covid-19 pandemic, where participatory and multimodal methods were adapted into an entirely online research design, including surveys, online family interviews and children's film-making. Thirdly, 'Toddlers Tech and Talk', a project investigating the home lives and technology use of children aged three and under, and the experience of collaboratively participating in the project's innovative ethnographic 'Day in the Life' methodology, including home video recordings and a parent-child photo diary.

Together these multimodal, participatory ethnographies illustrate an orientation towards 'research as play'. It will be argued that designing such playful methodologies allows for flexibility and surprise in the research process, supports meaningful co-creation with participants, encourages innovative experimentation with tools and technologies for data collection and reflects the messy vitality of everyday life. Framing 'research as play' may therefore be particularly apt for developing empowering and democratic methods with research participants, including but not limited to children. In this way, moments of multimodal meaning-making might shape research design where boundaries between research and play are blurred and blended.

Reference:
Kress, G. (2009) Multimodality: A Social Semiotic Approach to Contemporary Communication. London: Routledge

When and where: 25th of August 15:00 Lilla hörsalen, The Swedish Museum of Natural History

Designing for participation and engagement – a situated and phenomenological approach

Nina Bonderup Dohn

Professor of Learning and ICT, Dept. of Design, Media and Educational Science, University of Southern Denmark

Designing for participation and engagement is elusive – and theorizing it even more so. Who or what is participation and engagement a requirement of? The individual? The group? The disciplinary subject? The learning environment in which learners work? The educator? All of these – or none of them? (Who and what is to blame when our designs for participation and engagement fail?)

In this keynote, I discuss the different key aspects involved in designing for participation and engagement, focusing in particular on designs addressing critical global challenges such as sustainability, democracy, peace, equality, and rapid technological change. I do this from a perspective inspired by situated learning theory, socio-material accounts of human agency, and the phenomenology of Merleau-Ponty. These lines of inspiration combine to a view of human being as embodied and situated, acting in and attuning to the affordances and situational demands of concrete situations, without necessarily being consciously aware of what these affordances and demands are, or indeed, of attuning to or negotiating them in agency.

From this perspective, I analyze participation and engagement as learning objectives. As they are forms of activity in context, they are inherently situated. I thus ask what is required – of learners and of contexts – to facilitate, for instance, appropriate participation to further sustainability or critically reflective Generative AI use? Which combination – or holistic unity – of competence, attitudes, sensitivity, reflectiveness, character formation (Bildung/dannelse) etc. are we aiming for learners to achieve? What is required of the context – which disciplinary, educational, social, material, technological etc. affordances and situational demands should contexts offer to support learners in achieving this holistic unity? How do we design such affordances and situational demands?

I shall present a framework of context-levels for affordances and situational demands, with the levels of domain, activity, life-setting, societal structure, and cultural practices. I discuss how the affordances and demands intermingle and co-determine one another in specific instances, and how we can take that into consideration in designing for participation and engagement in designs addressing critical global challenges.

When and where: 26th of August 11:00 Lilla hörsalen, The Swedish Museum of Natural History

PAPER ABSTRACTS: PARALLEL SESSION A

Designing Participation Through School–Family Ecologies: Stakeholder Relations, Social and Emotional Learning, and Educational Engagement in Taiwan

PI-CHI HAN
National Kaohsiung Normal University, Kaohsiung, Taiwan

Social and emotional learning (SEL) has become a significant concern in contemporary education because it extends learning beyond cognitive attainment to include well-being, relational capacity, agency, and participation. Research on family–school partnership likewise shows that coordinated home–school efforts can strengthen children's academic and social-emotional development. Yet much less is known about how participation and engagement are designed through stakeholder relations in everyday school life, particularly in Asian contexts where authority, responsibility, communication, and school–family expectations are culturally mediated.

This paper examines how family–school partnership is interpreted and enacted as a design for participation and engagement within a Taiwanese SEL initiative. Drawn from a larger mixed-methods project across five schools in Taiwan—two elementary schools, two middle schools, and one high school—the broader study involved approximately 1,300 questionnaires. This paper reports the qualitative strand only, based on four SEL-focused focus group interviews with principals, parents, teachers, and school administrators. Students were included in the questionnaire phase but not in the focus group interviews. Four interrelated findings are advanced. First, principal leadership was decisive in legitimising SEL as a school priority and in shaping the institutional climate within which participation could be recognised and sustained. Secondly, parents were positioned not as peripheral supporters of schooling, but as indispensable partners whose trust, voice, and home-based engagement extended SEL into family life and broadened the learning environment. Thirdly, teachers served as pedagogical mediators, translating SEL into everyday relational and instructional practice while negotiating the expectations of both school and family. Fourthly, school administrators played a pivotal coordinating role by maintaining communication structures, organising implementation, and connecting institutional vision to daily enactment. Taken together, these findings suggest that participation and engagement are socially and institutionally designed through stakeholder negotiation, role differentiation, and culturally grounded school–family relations. The paper contributes to current discussions of learning design by foregrounding power relations and stakeholders, extending learning environments beyond the classroom, and showing how qualitative, practice-based research can address gaps in SEL and family–school partnership scholarship.

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Wu, M. Y.-H., Chen, H.-C., and Chen, P. (2025) 'Social and Emotional Learning Enhancing Teacher Well-Being and Professional Development in Taiwan: A Preliminary Study of the BEST ME Program', Social and Emotional Learning: Research, Practice, and Policy, 5, 100098.

From Implicit Processes to Explicit Practices: Agile-Supported Digital Scaffolding in PBL

Sandra Burri Gram-Hansen, Rune Gram Hagel Jensen, Tom Lykke Skov Gregersen
Aalborg University, Aalborg, Denmark

This paper provides initial insights from an ongoing study examining how digital project-management tools and methods can enhance problem-based learning (PBL) practices in higher education and support students' transition from university to professional life. Within the Aalborg University (AAU) PBL model, learning is organised around real-world problems, interdisciplinary inquiry, and collaborative teamwork. While this approach is widely recognised for fostering critical thinking, communication, and group-work competencies, prior research highlights a persistent challenge: students tend to prioritise report production and exam performance over the underlying project process, limiting their ability to articulate and transfer process-related skills into their future professions. To address this challenge, this study provides recommendations on how structured, transparent, and collaboratively accessible digital tools, such as Microsoft Planner, can enhance students' engagement with the project process. The study further positions PBL in relation to agile principles and methods derived from SCRUM, emphasizing iterative planning, ongoing reflection, and adaptive collaboration as complementary to the AAU PBL model.

Through workshop activities and hands-on exploration, participants use Planner to organize project phases, set goals, assign tasks, estimate time requirements, and continuously monitor progress. In this context, Planner serves as a lightweight digital scaffold for agile-inspired practices such as sprint planning, task breakdown, and visual workflow management, thereby helping students manage the complexity of collaborative project work. The findings indicate that such tools make the sometimes-unclear PBL process more transparent and manageable, enabling clearer communication of responsibilities, greater inclusion within groups, and a stronger shared understanding of the project workflow. By incorporating digital project-management practices aligned with agile principles into PBL, students not only enhance their ability to plan and coordinate academic projects but also develop transferable skills aligned with contemporary professional standards. The paper asserts that purposeful use of tools like Microsoft Planner can reinforce core PBL principles, collaboration, mutual responsibility, and reflective practice, while also preparing students for the iterative, team-based, and project-oriented nature of today's workplaces.

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Kolmos, A., Fink, F. K., & Krogh, L. (2004). The Aalborg PBL model: Progress, diversity and challenges. Aalborg University Press.

Participation in Adult Learning: A Comparative Analysis of EAEA Country Reports

Bahar Yüce & Servet Atik
Inonu University, Malatya, Turkey

Participation in adult learning and education (ALE) is widely recognized as a key priority across Europe (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2024). However, participation can mean different things, such as accessing learning opportunities, contributing to decision-making, or being active in civic life. Although participation rates are often monitored quantitatively, less attention has been paid to how participation itself is described, interpreted, and positioned within national contexts. This ongoing study examines how participation in adult learning is represented across different European settings through a comparative analysis of European Association for the Education of Adults (EAEA) country reports. The study utilizes a qualitative document analysis of twelve country reports generated by national member organizations of the EAEA (EAEA, n.d.). These reports provide structured overviews of adult learning settings across different countries, drawing on policy changes, statistical indicators, and stakeholder perspectives. Rather than analyzing official policy documents directly, the study examines how participation is framed and assessed within this composite reporting format. The analysis explores how participation is justified, which challenges it is expected to address, and how learners and other stakeholders are positioned within adult learning systems. Also, there is a lot of focus on how funding arrangements and new technologies, such as artificial intelligence, affect the conditions for engagement.

Preliminary findings suggest notable variation across the analyzed reports. In several contexts, participation in adult learning is linked to labor market participation and skills acquisition, as it helps adults maintain and update skills that support employability and career progression. (OECD, 2023). In other cases, participation is associated with social inclusion, cultural rights, or democratic engagement. At the same time, references to learners as active contributors to policy development appear limited in a number of reports. Funding structures—especially project-based or externally dependent mechanisms—seem to influence the stability and scope of participation opportunities. Approaches to technological change also differ across contexts, indicating diverse national priorities and concerns.
As the analysis continues, the study aims to develop a clearer comparative understanding of how participation in adult learning is interpreted and structured within contemporary European debates. By examining these variations, the paper contributes to discussions on governance, equality, and the evolving role of adult learning in responding to social and technological change.

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PAPER ABSTRACTS: PARALLEL SESSION B

How Teachers Draw Collaboration: Multimodal Reflections from a Makeathon

Roey Kafri, Yuval Segev, Erica Halverson

UW Madison, Madison, United States. Haifa University, Haifa, Israel

Collaborative learning environments often produce experiences that are difficult to articulate through language alone. In maker-based settings, participants navigate shifting roles, negotiation, uncertainty, and emotional tension as they create shared artifacts. Understanding how educators make sense of such experiences, a vital skill in the contemporary educational landscape, requires attention to the representational forms through which reflection is designed and enacted. From a social semiotic perspective, meaning is made across multiple modes, including language, image, and spatial composition (Kress, 2010), forming part of the broader "designs for learning" that shape how knowledge is communicated and transformed (Lindstrand & Insulander, 2022). As part of a broader PhD research project, this presentation examines how a deliberately designed multimodal reflection tool supported participation and sensemaking in a three-day professional learning makeathon for in-service educators. The makeathon positioned teachers as "designers for learning" (Selander, 2022), working in teams to design and build technology-enhanced educational artifacts in an open-ended constructionist environment. This approach views the makerspace as a didactic site for professional development where technological and pedagogical engagement intersect (Kjällander et al., 2018), emphasizing collaborative participation and public artifact creation (Papert, 1980). Participants completed a drawing-based reflection page that combined brief written prompts with drawing tasks representing their personal feelings and their group as objects.

The analysis treats each page as a multimodal unit. The corpus includes 101 reflection pages analyzed using low-inference descriptions and iterative identification of metaphor families (Lakoff & Johnson, 2003; Forceville & Urios-Aparisi, 2009). Preliminary findings suggest that written and drawn reflections operate through different semiotic logics. Written reflections narrate events through moral language (contribution, communication), while drawings organize collaboration spatially through compositional relations (center-periphery, symmetry). In this sense, the text tends to tell what happened, while the drawing models how it felt and how the group is imagined. Crucially, while written reflections describe negotiation and tension, drawings rarely depict conflict, instead presenting the group as a coherent system. This finding suggests that visual modes may reveal implicit, idealized models of participation, potentially masking asymmetrical power dynamics. The paper contributes to Designs for Learning research by showing how a designed multimodal reflection tool can make participation and implicit models of collaboration empirically visible.

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Values in Multimodal Assessment: Teacher's orchestration and Pancasila values in Indonesian EAL classroom

Laily Harti
University College London, London, United Kingdom

This study explores an EAL teacher's multimodal orchestration in assessment context and how such orchestration embody the values of the Pancasila Student Profile fleeting in everyday classroom practice. It focuses on one Indonesian senior high school English teacher implementing a group writing project of multimodal text that integrates peer and teacher feedback. Rather than treating assessment as the mere allocation of scores, the study conceptualises it as a social design space in which relations, criteria, and values are negotiated through the orchestration of multiple modes.

The study is anchored in multimodal social semiotics, with Diamantopoulou and Floren's (2025) operationalisation of Bezemer and Kress's (2016) principles of recontextualization as the analytical framework. Video data from one instructional unit are analysed through multimodal transcripts that map the teacher's speech, gaze, gesture, facial expression and movement during a teacher-feedback episode. The analysis shows that the teacher's assessment design materialises several dimensions of the Pancasila Student Profile (Suprayitno et al., 2020). First, the values of noble character emerge as the teacher consistently foregrounds respect for students' effort and dignity as she explicitly appreciates students appreciating their friends. Embodied modes such as soft gaze and smiling expressions are used simultaneously to preserve students' face when raising errors. Second, gotong royong (collaboration) and critical thinking are realised in the way she negotiates the tension between emotional loyalty and the need for honest critique. She raised an issue where students really appreciated their peers and therefore avoided mentioning mistakes and then recentred peer-feedback norms so that they remained both fair and relational. Third, the values of independence and responsibility appear as the teacher multimodally asserts her role as final evaluator while still inviting students into co-ownership of assessment, dialogic questioning, and schematic gestures that spatialise grammatical concepts. Independence and responsibility are thus construed not as purely individual traits but as shared engagement in deciding what counts as fair, accurate, and appreciation-worthy in peers' texts.

The study offers a concrete example of how assessment can be designed as a multimodal practice that aligns with curricular values. It extends multimodal social semiotics to the discussion of values in assessment.

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Exploring pupils' designs in learning when constructing buildings in MinecraftEdu in SAEC

Emelie Patron & Marina Wernholm
Linnéuniversitetet, Kalmar, Sweden

This study contributes to current discussions by highlighting the pedagogical potential of digital platforms within School-Age Educare Centre (SAEC) contexts and how multimodal, collaborative learning can be supported through digital–physical hybridity. However, debates persist in Sweden and internationally regarding children's screen time and the role of digital technologies in education. As a result, digital tools are sometimes absent from SAEC activities. This study takes as its premise that SAEC can offer safe digital environments, such as Minecraft Education, where all participants are known to teachers and peers, and where diverse learning opportunities can unfold. Previous research shows that hybrid learning activities can extend children's social, digital, and subject specific competences, with more knowledgeable peers supporting others in navigating both digital and physical spaces (Wernholm et al., 2025). Research further indicates that pupils' participation increases when they engage in activities that allow multiple forms of expression (Patron et al., 2026). This study aims to explore how pupils express their learning experiences and demonstrate competencies during teacher-designed building activities in MinecraftEdu within SAEC settings.

The following research questions guide the study:
How do pupils use different competencies when engaging with MinecraftEdu?
How do pupils express their learning experiences from engaging with MinecraftEdu?

This study draws on Designs for Learning theory and a social semiotic perspective on multimodality, viewing teaching and learning as multimodal design (Selander & Kress, 2010). The field work was conducted at a Swedish SAEC center with 52 pupils aged 8–10. The pupils were video recorded while constructing buildings in MinecraftEdu, and focus group interviews were conducted with 24 of them. Preliminary results show that pupils draw on a range of competencies, including subject competence. For example, constructing a pyramid in MinecraftEdu requires mathematical understanding; some pupils recognized errors in their design and revised their structures by identifying that the base had to be square. Pupils also described solving problems either through trial and error or by consulting more knowledgeable peers. The most prominent finding is the central role of social competence: collaborating successfully in this hybrid activity required communication, negotiation, and coordinated action. A preliminary conclusion is that both experienced and inexperienced Minecraft players participate actively and remain highly engaged during the activity, which creates conditions for the further development of these competencies.

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Catching evolution: Fourth graders' embodied play and multimodal meaning making in learning about natural selection

Kristina Danielsson, Lars Wallner, Johanna Aringer, Ammie Berglund
Stockholm University, Stockholm, Sweden. Linköping University, Norrköping, Sweden. Uppsala University, Uppsala, Sweden

Learning about evolution is complex. Creative activities such as comics (Aringer et al., 2025), and board games have been suggested as ways to facilitate meaning making about evolution, although more research is needed to understand the potential of such activities. This study examines a learning design in which primary students play a tag game to support their meaning making about natural selection. The aim is to investigate the learning potential of this setup, and the analysis focuses how students use (i) real-world experiences during gameplay and (b) experiences from the gameplay afterward to construct meaning about natural selection.

The study draws on a social semiotic perspective of multimodal theory (e.g., Kress, 2010), and designs for learning (Björklund Boistrup & Selander, 2022). In addition, concepts from play-responsive teaching (Pramling et al., 2019) are used, such as "as if" and "as is", to conceptualise relations between the game and the real world. Data consist of video and audio recordings from two biology lessons where 10-year-olds engaged in a version of a tag game: tail-tag (Sw: 'svanskull'). Students acted as monkeys with tails of varying lengths and were instructed to try to catch one another's tail. After each round, the monkeys 'reproduced', altering the distribution of tail types (if more students with shorter tails 'survived', the next round would have more of this type). Students were expected to notice that monkeys with longer tails were more easily caught, eventually becoming 'extinct'. The class then discussed what had occurred during the game, why, and how it related to natural selection.

The initial analysis was based on the learning design sequence model (Björklund Boistrup & Selander, 2022) to describe the setting, the primary transformation unit (the tail-tag game) and the secondary transformation unit (the subsequent discussion). For a more detailed analysis, we then conducted a combination of multimodal analysis (e.g., Kress, 2010) and reflexive thematic analysis (Braun & Clarke, 2021). This analysis shows that by playing the game, students experienced how traits other than the length of the tail also affected the selection process. Furthermore, we note that students' meaning making about natural selection is informed by their knowledge about animal behaviour ('as is') and their bodily experiences during the play ('as if').

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Beyond Passive Consumption: A Multimodal Framework for Creative Reading in Literary Studies

Rumiko Oyama
Meiji University, Tokyo, Japan

The research comes out of a question: Can act of reading be 'creative'? If so, in what way and how? The word 'creative' is ubiquitos in the pedagotic context, but the questions remains what it means to be 'creative' and how students' creativity should be assessd in a formal set-up such as schools and universities. Among so-called four skills (Reading, Listening, Writing and Speaking) that is often used as language learning components, reading has been considered rather passive, one-way communicaiton where readers 'take in' what is written in the text. The paper first reconsiders an act of reading not as a lenear and as more complex, multimodal meaning making activities, with particular referene to literary narrative. To demonstrate use of multimodality in literary studies, I propose a pedagogical model that uses narrative paintings to understand (written) literary narrative. Narrative paintings can multiply meaning of written narrative. The interaction between a painted image and written words can create entirely new and 'creative' interpretations that neither mode could achieve alone. Because narrative paintings often represent one frame of a larger story, they activate the imagination. Readers must ask questions about what happened before or after the depicted scene, treating the painting as a trans-modal bridge to a wider narrative world. From a cross-cultural perspective, narrative paintings often record cultural and historical events, providing a visual 'text' that connects readers to different eras and perspectives through given socio-cultural contexts. The paper therefore contends that narrative painting serves as a valid medium that works alongside written texts to deepen readers' comprehension, encourage interpretive inquiry, lead to a creative reading as opposed to passive acquisition of information and meaning. It is hoped that multimodal models for reading transforms the reader from a passive consumer into an active and 'creative' meaning maker, who can read creatively through multimodal channels.

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Emotional Design and Reading Achievement: When Does Animation Support Young Children's Narrative Comprehension?

Chun-Hung & Hsiang-Lien Lee

Department of Digital Media and Education Industry, National Taitung University, Taitung, Taiwan.
Department of visual art and design, Tainan, Taiwan

This study investigates how different narrative presentation formats influence young children's affective responses and narrative comprehension, and whether these effects vary by reading achievement. A 3 × 3 mixed design was employed, with presentation format (animation, static-image video, comic) and reading achievement level (high, medium, low) as the main factors. Participants were 264 second-grade students. (The study was conducted in accordance with IRB requirements, and parental consent was obtained.) Both the animated and static-image versions included spoken narration, whereas the comic version was presented in print only. All three versions were adapted from the same source text and controlled for consistency in verbal content, characters, and settings. Measures included reading comprehension and students' subjective ratings of attractiveness, preference, and perceived ease of learning.

Results showed that greater attractiveness did not necessarily translate into better learning outcomes. Although the animated version received the highest attractiveness ratings, both narrated video conditions outperformed the printed comic version in comprehension, suggesting that narration played a central supportive role in young children's narrative learning. The effects of format also varied by reading achievement. High-achieving students performed similarly across conditions, suggesting relatively stable comprehension strategies. Medium-achieving students benefited mainly from narrated support, regardless of whether the visuals were dynamic or static. Low-achieving students showed a significant advantage only in the animated condition, indicating that dynamic visual cues may provide compensatory support for weaker readers. Overall, emotional design should not be treated merely as a way to increase attention or enjoyment. Its instructional value depends on whether it works together with other representational cues to support engagement, meaning-making, and differentiated learning needs.

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Exploring Professional Stagnation among University EMI Teachers: A Multidimensional Analysis of Emotional Experience, Professional Identity, and Institutional Contexts

To-ken Lee

Taipei Medical University, Taipei City, Taiwan

The rapid expansion of English-medium instruction (EMI) in higher education has created new demands not only for students but also for subject teachers, who are expected to redesign their teaching practices, negotiate professional identities, and sustain engagement in multilingual classrooms. While previous EMI research has extensively examined student challenges (Macaro et al., 2018), teacher beliefs, pedagogical practices, and professional development needs, less empirical attention has been given to professional stagnation among EMI teachers (Richards & Pun, 2022).

This study addresses this gap by conceptualizing professional stagnation as a multidimensional phenomenon shaped by emotional experience, professional identity, and institutional context. Drawing on Maslach's (2016) burnout framework, Biesta et al.'s (2015) ecological perspective on teacher agency, and Beauchamp and Thomas's (2009) theory of teacher professional identity, this study develops the Teacher Professional Stagnation Diagnostic Model (TPSD). The model is designed to identify how emotional exhaustion, constrained agency, and identity tensions may interact with institutional conditions to limit teachers' participation in professional learning and pedagogical change. Methodologically, the study employs a mixed-methods design involving questionnaires, focus group interviews, and teacher reflective data collected from EMI teachers participating in Communities of Practice in Taiwan. Quantitative data will be used to examine patterns of perceived stagnation, while qualitative data will be analyzed by using Braun and Clarke's (2006) thematic analysis to explore how teachers interpret their professional challenges, emotional experiences, and opportunities for growth. By developing and testing the TPSD model, the study contributes a design-oriented diagnostic framework for understanding and supporting EMI teachers' professional learning. It offers implications for designing more responsive professional development environments that promote teacher participation, engagement, and sustainable pedagogical change in higher education EMI contexts.

Where Is Design Justice in Design Education? Examining Its Presence in Industrial Design Education Literature, Curricula, and Self-Positioning of Students and Alumni

Melis Örnekoğlu-Selçuk, Lore Brosens, Francesca Ostuzzi
Ghent University, Kortrijk, Belgium

Design justice is a framework that challenges designers to critically reflect on how to avoid perpetuating inequalities through their design processes and outcomes (Costanza-Chock, 2018). It aligns with the shift from designing for people towards designing with them, recognizing people as the experts of their own lived experiences (McKercher, 2020) and creative contributors when given appropriate tools (Sanders & Stappers, 2008). A deep understanding of design justice is essential for more inclusive and just design, supporting designers to become more intentional and aware of their roles and impact.

Responding to Costanza-Chock's (2020) call to explore the implications of design justice within industrial design, this ongoing research focuses on this field. First, drawing on findings from a systematic literature review, this study examines how and to what extent design justice has been discussed within design education research (RQ1). Second, it explores how design justice is reflected in industrial design engineering curricula through benchmarking of university websites (RQ2), considering Biggs' (2003) constructive alignment approach (RQ2.1). Third, it presents insights from an ongoing survey, analyzing how industrial design engineering students and alumni describe the kind of designer they aspire to become (RQ3), and whether/how these aspirations align with design justice (RQ3.1).
Preliminary findings from the systematic literature review suggest that relatively few studies explicitly address design justice in design education, while related themes such as social innovation are more common. The curriculum analysis shows limited design justice-related content, with engineering-oriented curricula emphasizing technocentric approaches (Ceschin & Gaziulusoy, 2019) and design-oriented curricula more often addressing marginalized people and social innovation. The "design justice" term is often not explicitly used. Preliminary survey findings suggest that students and alumni aspire to create purposeful impact differently, positioning the designer along a spectrum from problem-solver and decision-maker to facilitator of participation and shared decision-making.

By triangulating these perspectives, this study contributes to ongoing discussions on participation in education. It highlights gaps between academic discourse, institutional curricula, and learners' evolving identities, and calls for more explicit and integrated approaches to embedding design justice within industrial design engineering education connecting these three interconnected domains.

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PAPER ABSTRACTS: PARALLEL SESSION C

Zoom as semiotic technology: The multimodal construction of 'presence' in online teaching

Elin Stenberg
Örebro University, Örebro, Sweden

Zoom has become a predominant platform for synchronous teaching and learning in higher education. As a digital learning environment, it offers specific multimodal resources and affordances that shape both pedagogical design and interactional possibilities, thereby influencing the ways in which teaching and learning unfold in practice. Previous research shows that that an experience of presence is vital for meaningful learning experiences, but that it can be particularly challenging to maintain and support in online teaching. Drawing on the Community of Inquiry (CoI) framework (Garrison et al., 2000), this paper examines how three interrelated forms of presence – social, cognitive, and teaching presence – can be designed and realised through Zoom's available resources. The study focuses on how teachers in Swedish higher education reflect on and handle the technological and interactional affordances of Zoom when designing and conducting online seminars.

Methodologically, the paper combines a design-oriented analysis of Zoom as a semiotic technology (Zhao & van Leeuwen, 2014; Björklund Boistrup & Selander, 2022) with ethnographic methods, specifically teacher interviews and observations of Zoom seminars. This combination enables analysis of the technology's semiotic and pedagogical potentials, as well as how these are interpreted, adapted, or left unused in real teaching scenarios. In addition, the concept of canvas (Bateman et al., 2017) is employed to analyse interactions within Zoom, including participant–participant and participant–media interactions. The analysis focuses specifically on Zoom's video, audio, chat, shared screen, and whiteboard canvases and their distinct properties.

The findings indicate that the specific semiotic properties of Zoom's canvases shape how the three forms of presence can be designed and realised. Canvases that support one type of presence can also constrain another; for example, the shared screen can support phases of cognitive presence while simultaneously limiting embodied cues associated with social presence. Moreover, some canvases are foregrounded by the technology's design and appear more frequently in seminar designs. Perceived affordances influence teachers' design choices, and the full meaning potential of the technology is not always realised.

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Primary School Pupils Engagement in Reading

Susanna Pöntinen, Sinikka Räty-Záborszky, Päivi Björn, Hilkka Räty
University of Eastern Finland, Joensuu, Finland

Literacy is widely recognised as a cornerstone of education and culture, and pupils' engagement in reading is seen as essential for learning. Growing disparities in young people's literacy, combined with pupils' declining interest in reading, have raised increasing concern (Mullis et al., 2023). Despite this, research on reading has typically treated pupils as targets of measurement rather than as active meaning makers. As a result, still relatively little is known about how pupils themselves describe their reading and reading experiences.
Reading engagement can be understood as the extent to which a reader participates actively, willingly and meaningfully in reading (Wigfield & Guthrie, 2000). Yet, although the concept is central to literacy development, research directly addressing reading engagement remains limited (McGeown & Smith, 2024). This presentation responds to this gap by focusing on pupils' own articulations of their reading.
The presentation is a part of the action research project aiming to create a reading-friendly culture in a primary school classroom 2023-2026. In the classroom many types of reading, linguistic backgrounds and emphatic interaction were valued. Collaboration carried out with teachers, researchers, homes and the library, aiming through pedagogical methods to create a positive atmosphere where all kinds of reading were supported. The school environment was also in focus: the classroom was decorated to be a flexible, versatile, and functional reading environment including reading printed and digital texts. The project was supported by the Finnish National Agency for Education.

The research data consisted of written reflections (N=134) from 23 pupils in Grades 3–5 (ages 9–11). The pupils reflected their own reading habits and experiences expressing e.g., why they read, their favourite reading places, and with whom they discuss books. The data was analysed using theory-guided content analysis by applying four-dimensional model of reading engagement proposed by McGeown and Smith (2024).
The findings show that pupils actively engaged in reading and assigned positive meanings to it. The dimensions of engagement manifested as follows, among others: finding enjoyable texts and aesthetic reading places (behavioural engagement), experiencing joy and relaxing while reading (affective engagement), belonging in discussions of reading at school, at home and in the library (social engagement), and valuing the development of their reading skills (cognitive engagement).
As a conclusion, the classroom reading environment through collaboration between teachers, researchers, pupils, libraries, and homes can support a positive reading culture. Despite these positive findings, creating meaningful reading experiences requires pedagogically empathetic and personalized tasks that inspire pupils.

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Project Play: Designing for Language and Literacy Development through Play in Higher Education

Melinda Mathe, Jonathan deHaan, James York

Stockholm University, Stockholm, Sweden. University of Shizuoka, Shizuoka, Japan.
Meiji University, Tokyo, Japan

Play is fundamental to human experience and learning, supporting exploration, social interaction, and problem-solving. While extensively studied in childhood, playful learning in adulthood remains underexplored, particularly in higher education. At the same time, higher education is increasingly shaped by measurable outcomes, efficiency, and standardized evidence. In response to this trend, gamified approaches have gained traction in language teaching and learning, often emphasizing competition, rewards, short-term gains, and vocabulary learning. Against this backdrop, we examine play as an alternative orientation to language and literacy teaching, positioning it as a set of specific design choices for learning that shape how participation, meaning-making, and inquiry are organized. This paper presents Project Play, an exploratory, sequential mixed-methods action research study conducted in an elective English language and literacy course at a Japanese university between October 2024 and January 2025. The teacher-researchers designed a ludic pedagogical and research environment, drawing on the Iterative Game Design Cycle, the Pedagogy of Multiliteracies (PedML) (Cope & Kalantzis, 2000), and conceptualizations of play (deHaan & York, 2025). The course was structured across two PedML cycles, integrating digital and analog games with multimodal tools, pre- and post-course and gameplay language tests, weekly diaries, gameplay transcripts, and student projects. Students learned through play and also researched their own learning processes. They took on roles such as game designers, researchers, and artists, and worked with their own data by transcribing gameplay, coding language use, reflecting on their learning, and evaluating their development over time. The design positioned the teacher as a researcher who adopted a playtest mindset, co-designed activities with students, and continuously refined methods and materials. Collaborating researchers contributed through classroom observations, engagement with student work, and ongoing interpretive discussions, while engaging with the data in exploratory ways. These design choices generated a rich dataset that reflected learning as an entangled, non-linear process in which gameplay, language practices, and research activities shaped one another.

Data analysis involved descriptive statistical analysis and thematic analysis of student-generated qualitative data. Results indicate language and literacy gains, and show how the design enabled new forms of participation that extended beyond gameplay into community-oriented projects. Students reported improvements in curiosity, health, and happiness, and identified digital game work as especially valuable for literacy and inquiry. We highlight challenges, including workload, limitations of self-reported data, and the teacher's role as researcher. The study contributes to research by conceptualizing play as a set of design choices that reshape how learning, participation, and inquiry are organized through playful methods, multimodal materials, reflection, creative production, mediational practices, and attitudes that cultivate safety, curiosity, and participation. We invite researchers and teachers to play with both the pedagogical design and the research tools in their own contexts.

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PAPER ABSTRACTS: PARALLEL SESSION D

Designing for Six-Year-Olds' Meaning-Making in Multilingual Classrooms

Marina Wernholm, Emelie Patron, Kristina Danielsson, Andreas Ebbelind, Hanna Palmér
Linneuniversitetet, Kalmar, Sweden. Stockholms universitet, Stockholm, Sweden. Linneuniversitetet, Växjö, Sweden

This study is part of the project Exploring Six-Year-Olds' Meaning-Making in Different Subjects through Multimodal Teaching and Their Creation of Digital Animations. A central premise is that an equitable school system should offer all children the same opportunities to participate in education, express themselves, and develop their learning identities. The purpose of this study is therefore to investigate how pupils in multilingual classrooms use various resources in group activities focused on multimodal text creation. The study draws on the theoretical perspective of Designs for Learning (DfL), in which teaching and learning are conceptualized as forms of multimodal design (Selander & Kress, 2010). By designing learning activities that incorporate both analogue and digital resources, teachers create conditions for six-year-olds' meaning-making and support their right to express themselves in multiple ways—a core aspect of the school's democratic mission. The following research questions guide the study:
Which resources do pupils use in the group activities when creating multimodal texts?
Which resources appear to constrain or support pupils' opportunities to make meaning in the multimodal text-creation activities?

Developing a strong learning identity and confidence in one's abilities early on is crucial, as these factors influence children's opportunities for lifelong learning and active participation in democratic practices both in and outside of school. Some children risk falling behind as early as the first year of compulsory schooling. Research has identified tensions between children's literacy practices at home and in school, particularly regarding the use of digital tools, and these contrasts may negatively affect young children's learning identities (Livingstone & Sefton-Green, 2016; McTavish, 2009). The empirical material consists of video recordings of pupils' group-based multimodal text creation, involving both analogue and digital resources. The analysis shows that analogue resources, such as paper figurines, enable pupils who have not yet mastered the school language (Swedish) to demonstrate their understanding of the fairy tale The Three Billy Goats Gruff by retelling it with the support of these materials. In the process of creating the digital animation, the pupils show a high degree of engagement: they interact more with one another than when working with analogue resources, negotiate, ask questions, and contribute in various ways to the shared multimodal text. The preliminary findings highlight the importance of teachers providing access to both analogue and digital resources, as this allows pupils to draw on different competencies and abilities in their meaning-making. This appears to create conditions for democratic learning in which every pupil has the opportunity to express themselves and influence the shared outcome.

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Expanding the Landscape of Participation: Meaning-Making Through Photography in Multilingual Classrooms

Maria Söderling

Malmö university, Malmö, Sweden. Burlövs kommun, Burlöv, Sweden

The digitization of society has transformed the conditions for communication and learning, expanding access to a wide range of semiotic resources. Despite this, educational practices remain largely dominated by written and spoken language, limiting opportunities for participation through alternative modes. This presentation addresses how designing for multimodal literacy practices—specifically through photography—can support participation and engagement in contemporary educational landscapes. Grounded in a multimodal literacy perspective informed by social semiotic theory, the study conceptualizes meaning-making as a socially situated process in which learners actively select and transform semiotic resources. Within this framework, photography is approached as a design for learning that enables pupils to represent experiences, positions, and disciplinary knowledge in ways that extend beyond linguistic constraints. The study responds to a persistent gap in research and practice, where meaning-making through images remains comparatively underexplored despite its centrality in young people's everyday communication.

The paper draws on a design-based research study conducted in collaboration with teachers and pupils aged 10–12 in Swedish compulsory school. Across a series of designed learning sequences, pupils used tablet cameras to explore subject content, express viewpoints, and interact around each other's photographs. The analysis focuses on how pupils realise affordances for meaning-making during the photographing process. The findings show that photographing as a literacy practice is characterised by high levels of agency, as well as spatial and cognitive mobility. Meaning-making often unfolds as a multimodal process across semiotic resources, which creates expanded possibilities for participation. At the same time, the study identifies tensions in the design of learning environments: while engagement is strong during the production of images, it is not always sustained in interaction or recognised in assessment practices. The paper argues that designing for participation requires not only access to multimodal tools but also pedagogical designs and assessment practices that acknowledge diverse forms of meaning-making. By positioning photography as a resource for learning, the study contributes to ongoing discussions on how multimodal literacies can support inclusive and participatory education in contexts shaped by rapid technological and social change.

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Developing a model for systematic observations in primary teacher education: Analyzing multimodal orchestrations in early literacy teaching

Kim Ridell

Malmö university, Cultur-Language-Media, Malmö, Sweden

Early literacy education is under on-going scrutiny in public and political debate regarding its content and teaching instructions. In Sweden, upcoming revisions of the curricula for early primary literacy education and teacher education emphasize core skills and explicit, systematic instructional strategies (Ridell, 2025; Hughes et al., 2017). To align with these developments, courses at Malmö University are being redesigned in teacher education to foreground multimodal and explicit teaching practices, as well as revising examinations to highlight teachers' instructional design and orchestrations. This work draws on a multimodal social-semiotic framework (Jewitt et al., 2025) and principles of design for learning (Selander & Kress, 2021), focusing on observable modes and semiotic resources made available to young learners.

This presentation reports two course components in which student teachers apply an analytical model – in on-going development – to systematically examine how teaching strategies in video cases are realized through varied and overlapping modes. The analytical stages involves 1) identifying a tentative content area for learners' early literacy development in the case, 2) identify which modes and semiotic resources are realized in the video via teaching material and the teacher's orchestration, 3) analyze how the multitude of modes guide the young learners intermodally (cf. Ridell & Walldén, 2024) or by separate modes and resources as orchestrated teaching strategies and 4) potentially revise which content areas are highlighted in the case (as the micro-analysis tends to reveal more content areas than tentatively available prior to analysis).

This process allows the teacher students to conceptualize teaching strategies to understand how practicising teachers orchestraste different modes and semiotic resources for making lesson content explicit. For example, how the teacher segments parts of a story through visual markers on the whiteboard, models the sound and gestural articulation of a phoneme or verbally unpacks the meaning of a visual metaphor or image.

The empirical material presented consists of (1) text-based cases from early literacy domains (e.g., decoding, vocabulary, reading comprehension) and (2) short video recordings of classroom practices. Both materials provide rich examples of multimodal teaching strategies in early reading and writing instruction.

Feedback indicates that student teachers appreciate gaining tools to make the complexity of multimodal teacher orchestrations visible and to articulate instructional strategies that often remain tacit. Participants—both teacher students and practicing teachers in continuing education—develop an enhanced capacity to analyze, understand, and design nuanced early literacy teaching grounded in systematic multimodal observations.

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Case Study on Gender-Based Ethics as a Core Outcome in Graphic Design Education

Joshua Pridemore, Ethan Cutler, Jacob Henss
University of Illinois Urbana-Champaign, Champaign, United States.
University of Illinois Urbana-Champaign, Campaign, United States

This paper examines how gender-based ethics can be positioned as a primary learning outcome in graphic design education while maintaining technical proficiency as a parallel objective. In many design curricula, ethics is often treated as a supplementary or discussion-based component, secondary to the development of formal and technical skills. This study argues for a pedagogical model in which ethical reasoning, specifically in relation to gender, representation, and power, is central to how design is taught, practiced, and evaluated. The paper draws on a course case study of ARTD 451 Ethics of a Designer in a Global Economy at the University of Illinois Urbana-Champaign, focusing on a 10-week module dedicated to gender and design. In this course, ethics is embedded directly into design production rather than introduced as abstract theory. Students analyze media representations of gender across intersecting identities and translate these insights into deliverables that combine analog and digital methods. These exercises function simultaneously as technical skill development and critical inquiry, establishing a framework in which making and meaning are inseparable. The course culminates in campaign-based interventions, where students design communication systems addressing real-world gender-related issues and articulate their positions through written and visual manifestos.

To support this pedagogical model, the paper incorporates both qualitative student reflections and course evaluation data. Thirty students reported strong alignment between course activities and learning outcomes, as well as consistent opportunities to apply knowledge through projects, suggesting that the integration of ethics did not detract from technical skill development. Overall course quality (M = 4.43/5) and instructional effectiveness (M = 4.64/5) further indicate that students perceived the course as rigorous and valuable. Qualitative reflections reinforce these findings, with students describing the course as “an eye opener” that reshaped how they understand design as inherently ethical and political, and noting increased awareness of bias in even “the smallest design choice”. These responses provide insight into how students internalize ethical frameworks and apply them within their design practice.

By positioning gender-based ethics as a core outcome, the course demonstrates that ethical reasoning can actively shape, rather than follow, design production. In this framework, technical skill is not diminished but redirected, functioning as a tool for critical engagement and social intervention. This approach suggests that design education consider moving beyond teaching students solely how to make, toward teaching them how to make responsibly within complex systems of power, representation, and influence.

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Designing Sonic Learning Environments for Distributed Creativity: A Collaborative Modular Synth Exploration

Roey Kafri
UW Madison, Madison, United States

Research in the learning sciences has long emphasized that learning emerges through social interaction and participation in shared practices (Lave & Wenger, 1991). Constructionist perspectives further highlight how understanding develops through making and public engagement with artifacts (Papert, 1980). Within the Designs for Learning tradition, learning environments are understood as designed constellations of semiotic resources that shape participation and meaning-making (Selander & Kress, 2010). Yet collaborative learning is still often analyzed mainly through verbal interaction or finished artifacts. Less attention has been given to environments in which participation is mediated through ambient signals generated by ongoing activity. This paper examines how collaborative sense-making unfolds in a modular synthesizer environment, where sound continuously circulates through the space as participants manipulate cables, modules, and signal paths. In such settings, participants influence one another not only through direct communication but also through sonic patterns that recruit attention, interpretation, and action. Sound thus becomes a designed mediating resource for participation.

The analysis draws on Collaborative Constructionist Learning, which emphasizes how learning emerges through interaction around evolving artifacts in shared environments. It also draws on distributed creativity, which understands creative processes as socially and materially distributed rather than located in individual minds (Sawyer & DeZutter, 2009). Empirically, the paper analyzes a pilot session of the Contracked Project in which three graduate students with no prior experience in sound production collaboratively explored a modular synthesizer system. Participants engaged with a set of open-ended achievements designed to support experimentation, such as creating rhythmic patterns, constructing signal paths, and generating random melodies. Using interaction analysis of video and audio recordings, the study examines how participation unfolded through three processes: embodied musical sense-making, in which participants responded to emerging sounds through movement, gaze, and vocal imitation; distributed influence, in which one participant's response to sound recruited others' attention and activity; and epistemic shifts, in which participants moved between producing sound and investigating it as an object of inquiry. The paper proposes collaboration through the air as a conceptual lens for understanding how participation can emerge through ambient multimodal signals circulating within artifact-rich learning environments. The study contributes to discussions of designing for participation and engagement by showing how sound can function not merely as output, but as a mediating resource that organizes attention, coordination, and collaborative creativity.

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Designing for Neurodiversity, Iterative Spaces of Learning, Diagnosis and Therapy

Rosa Urbano Gutierrez, Johanna Muszbek, Sarah Bailey, Yiting Cheah

Manchester Metropolitan University, School of Architecturersity, School of Architecture, Manchester, United Kingdom. University of Liverpool, Department of Architecture, London, United Kingdom. Liverpool City Council, Liverpool, United Kingdom

As of 2026, an estimated 15–20% of the global population is neurodivergent—equivalent to roughly one in five people worldwide—including individuals with neurological differences such as ADHD, autism, dyslexia, and dyspraxia [1.]. In the UK, the population of diagnosed neurodiverse children have increased by over 100% between 2016 and 2026, with the number of pupils requiring high-level support approximately doubling over the decade [2.]. Ensuring an equitable quality of life for this growing population, including full participation in economic and social life, depends on learning environments that support diverse sensory and cognitive profiles. An increasing global awareness of neurodiverse conditions, alongside positive results of Sensory Integration Therapy (SIT) practices are putting pressure on governments and schools to provide specialist learning environments [3.] Specialist learning settings such as Sensory Integration Facilities are increasingly central to diagnosis, therapy, and teaching, yet provision is uneven and design guidance remains limited. Existing inclusive-design frameworks offer few specific recommendations for sensory environments and are frequently constrained by the "lack of research" that connects spatial decisions to therapeutic practice [4.]. Without these specific guidelines, schools won't be able to respond at the speed and efficiency this urgency requires. To address this issue, the paper positions methodological exchange between architectural design and occupational therapy as a catalyst for developing new frameworks to understand and design spaces for neurodiversity. These new guidelines need to be adaptable to the varied, bespoke nature of the practice offering a repertoire of solutions which can help set up new environments or retrofit existing ones. To achieve this, we conducted a trans-disciplinary study with partners across architecture, occupational therapy, education, and allied fields. We assembled rich empirical evidence from six purpose-designed SIT institutions across the UK, serving varied communities and demographic contexts.

Data collection combined qualitative ethnographic methods—semi-structured interviews with occupational therapists, physiotherapists, psychotherapists, educators, managers, designers, regulators, and members of a Neurodiversity Council—alongside site surveys, measured drawings, and photographic documentation. To synthesise this heterogeneous dataset, we developed and tested a hierarchical classification model structured around the trifecta: (1) design principles (what guides design?), (2) design strategies (how principles are implemented?), and (3) design outcomes/tools (how solutions materialise in sensory, spatial, and environmental terms, and where they operate?).

This paper presents the methodological, theoretical, and practical findings of this research, including the Designing for Neurodiversity Platform —a co-production framework that convenes stakeholders to generate actionable, interdisciplinary, and adaptable design guidance for neuro-inclusive educational spaces. The paper distills how physical and environmental conditions support neurodivergent children across three interlinked stages (diagnosis, treatment, and learning) and demonstrates how trans-disciplinary collaboration can accelerate the development of robust, transferable design guidelines for new-build and retrofit contexts.

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Learning designs for teacher and student exploration of emerging technologies in the humanities: making sense of generative AI

Inger-Marie Falgren Christensen
Department of design, media and educational science, University of Southern Denmark, Kolding, Denmark

This paper reports on a design-based research study, the purpose of which was to develop, test and refine learning designs for exploration of generative AI (genAI) in connection with teaching and assessment in the humanities in higher education (HE). The background for the study was the fact that many existing regulations place the burden of finding out how best to use genAI and how to declare use, on students (Corbin et al., 2025; Dawson et al., 2024). This makes gen AI a hidden curriculum where students who use genAI might get an advantage compared to those who do not (Chiu, 2024). In addition, the discourse in HE on genAI remains marked by mistrust and suspicion that students use genAI to cheat on exams (Dawson et al., 2024; Luo, 2025). To demystify genAI and support my students in engaging with the technology in useful ways, I developed a learning design for our joint exploration. The context is the 4th semester BA-course Learning and knowledge sharing. As part of this course, students are to plan, carry out and report on an empirical investigation in a specific organisation, exploring an issue related to the course themes. The developed learning design was inspired by Bowen and Watson (2024) and supported students in exploring potential uses of genAI in the different phases of the empirical inquiry. Design components included templates that scaffolded students' iterative, creative and critical use of genAI as well as their reflections, engaging in genAI-supported learning. The design was first tested in 2025 and data on students' experiences were collected via a survey in connection with the mid-term evaluation of the course. On the background of this evaluation, the design was refined and tested in spring 2026. In this presentation, I will share the details of the learning design, explain what motivated it, offer highlights from students' evaluations and explain how this informed the redesign. A particular finding is the variety in students' prior experiences with genAI technology and their contrasting attitudes towards use. Values and emotions enter the picture and should be the object of future investigations.

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Vibe-coding in the classroom: How can students use vibe coding to explore school subject matter?

Vidar Skogvoll, Harald Zeigler, Erling Midtgard, Karl Henrik Fredly, Ane Aarre, Øystein Gilje
University of Oslo, OSLO, Norway. Oslo Municipality, Oslo, Norway

Computers can be powerful learning aids (Papert, 1980). The core idea is that programming enables students to construct knowledge actively by building, testing, and debugging models of the world. This is part of the reason why programming has been introduced into national curricula in several European countries over the last decade (Vinnervik & Bungum, 2022). With the emergence of generative AI, this constructionist vision has become even more accessible. Students can now use AI to write code by simply instructing it with natural language, a practice increasingly referred to as "vibe coding." Early evidence suggests that vibe coding can support novice programmers in genuinely productive ways (Kazemitabaar et al., 2023).
However, empirical research on how to scaffold such activities in schools remains scarce. A central concern for student learning is cognitive offloading: while AI assistance can relieve students of low-level tasks such as managing syntax, there is a risk that students offload the deeper cognitive struggle that drives learning to program (Lodge & Loble, 2026). Furthermore, students who lack foundational programming knowledge find vibe coding significantly harder to navigate. Without a conceptual model of what the code should do, they struggle to evaluate, correct, or build meaningfully on AI-generated output (Andleeb et al., 2025). Without scaffolding, students risk simply accepting AI-generated solutions rather than being active participants in their own learning of programming concepts.

To address these challenges, we invited teachers and students from upper secondary schools in Oslo, Norway, to participate in a vibe-coding workshop organised in collaboration between FIKS (University of Oslo) and the Oslo School Authority. Students chose their own subject-matter topics and used generative AI to build working applications. The study draws on three linked data sources. During the workshop, researchers conducted structured observations along five dimensions: competence level, code comprehension, practical mastery, ownership and pride, and perceived usefulness — including targeted questions such as asking students to explain their code. At the end of the session, participants completed a survey covering prior programming experience, self-assessed familiarity with key programming concepts, and reflections on the vibe-coding process. We also collected student-generated material including chat logs and code. By linking these sources per participant, we enable triangulation of self-reported data, observed behaviour, and produced code.

We address the following research questions: How do students with varying degrees of programming experience interact with generative AI to generate and refine code? What scaffolds and forms of prior knowledge are necessary for vibe coding to function as a productive tool for subject exploration?

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Piloting an AI book-recommendation chatbot to foster volitional reading

Susanna Pöntinen, Sinikka Räty-Záborszky, Päivi Björn, Hilkka Räty
University of Joensuu, Joensuu, Finland

Research emphasises that volitional reading thrives when young people have access to appealing texts, opportunities for independent reading, and the agency to choose books that reflect their interests and identities (Loh et al., 2025). However, finding a good book can be difficult for pupils, and it is challenging for teachers to choose books that will interest pupils (Ivey & Broaddus, 2001). Thus, attempts to improve access to books that meet pupils' interests are important at school.

Since AI chatbots are becoming increasingly present in education, offering personalized guidance and interactive support is a promising strategy to support pupils' volitional reading. While AI chatbots still face challenges related to reliability, conversational rigidity, and responsiveness to diverse learner behaviours, conversational AI is gaining ground (Labadze et al., 2023). However, experiences of personalized book-AI searches remain very limited. For example, Capotosto and Sanders (2025) expanded traditional library databases by guiding middle school students to use ChatGPT to search for a free-choice book. However, compared to general AI language model technologies, teacher can guide chatbot use through predefined conversational prompts and monitor pupils' conversations (Labadze et al., 2023). Against this backdrop, studying a book recommendation chatbot is timely.

We present initial research results from piloting a book recommendation chatbot in one primary school Grade Five class in Finland. The chatbot was designed and prompted in collaboration with class teachers and researchers as part of action research to foster pupils' reading. School AI was chosen because it was considered a safe environment, allowing the use of nicknames instead of real usernames and enabling teachers to monitor conversations. Preliminary results show that an AI chatbot can align with key principles for fostering volitional reading by helping pupils articulate their reading preferences, discover appealing books, and engage in supportive dialogues. Pupils' interactions with the chatbot revealed conversations ranging from thoughtful self-reflection to playful resistance. Our study showed certain limitations, suggesting re-designing the chatbot for better handling of diverse interaction styles, reducing repetition, improving adaptive conversation flow, and increasing support for pupils who articulate their preferences well.
Despite piloting the AI chatbot only in one classroom, this study contributes knowledge about how AI-mediated reading support can be integrated into school at a time when both volitional reading and digital interaction are changing.

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Entrepreneurial Adoption of Learning Sciences Principles in African EdTech Product Development

Dr. Collins N. Vaye, Marti Louw, Peter Brown, Dr. Tutaleni Iita Asino, Dr. Amy Ogan
Carnegie Mellon University, Pittsburgh, United States. MEST Africa, Accra, Ghana

Designing for human learning is complex, but well-established principles grounded in the science of learning can reliably improve outcomes. With the rapid growth of local EdTech entrepreneurship across the African continent, there is a pressing need for approaches that make learning science accessible, actionable, and relevant for non-academic practitioners. The Learning Science for Innovators (LSFI) program in Africa aims to strengthen EdTech design by African entrepreneurs through applied learning science know-how. This initiative is a collaboration between (university partner) and 11 innovation hubs across Africa, working with a cohort of 12 EdTech Fellows each year over three years.

This paper reports on a design-based research project to develop a set of learning science principle cards that translate research on human learning into practical guidance for improving product design and outcomes. We identified 32 learning principles known to support memory formation, knowledge refinement, and sensemaking (Koedinger et al., 2013).

We report on three use cases that trace the cards' evolution from a facilitation support to a structured diagnostic assessment tool. Initially, the cards were used across hubs in two main ways: (1) onboarding workshops introducing learning science concepts (e.g., in Ethiopia, Benin, Senegal, and South Africa), and (2) a lightweight self-assessment and mentoring aid where Fellows identified principles already in use and those they aimed to adopt (e.g., in Ghana, Tanzania, and Kenya). These uses helped establish a shared vocabulary linking research-backed principles to product design and enable the tracking of their implementation.

Reviewing frequency counts of card use, Fellows were most likely to have implemented instructional design principles related to content structuring, such as "Intentional Sequencing", while sensemaking principles associated with reasoning and reflection, such as "Facilitative Feedback" and "Metacognition" were placed in the aspirational category. Building on this foundation, the cards evolved into a structured "Learning Sciences in Action" assessment cycle co-created with the MEST hub in Ghana. In this study, 12 EdTech Fellows completed detailed self-assessments mapping all 32 principles to their products, followed by recorded demo sessions explaining their implementation decisions to program staff. Inductive analysis of observation notes and transcripts revealed three key findings.

First, Fellows consistently demonstrated more principles in practice than they reported in self-assessments of their product design, revealing capabilities that written responses alone missed. Second, adoption of content structuring principles (e.g., Segmenting and Feedback), achieved higher uptake, while principles associated with sense-making (e.g., Metacognition and Explanation) were implemented less often. Third, the cards surfaced how resource-related constraints affect adoption. For example, offline-first products could not support cloud-based analytics for personalized feedback and multilingual inclusion requirements obviated standard multimedia design redundancy guidance.

These findings show how a co-designed science communication aid evolved into a diagnostic design tool in practice, revealing not only whether learning science principles are applied, but also why not, particularly within the constraints of African EdTech ecosystems.

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Democratising research-informed practices in the context of digital learning designs: Global approaches to systemic edtech testbedding

Anna Åkerfeldt & Alison Clark-Wilson

Linköping university, Linköping, Sweden. University College London, UCL Institute of Education, London, United Kingdom

The use of digital learning technologies in education has intensified longstanding tensions over what counts as valid evidence regarding student outcomes or teaching effectiveness. Questions regarding who produces the evidence, and whose knowledge is legitimised are also questions that arise in research, policy, and school environments. Despite increasing investment in EdTech, research-informed practices remain unevenly distributed, often privileging centralised, expert-driven models of evaluation that marginalise, or possibly ignore, practitioner and learner perspectives (Batty et al., 2019; Vanbecelaere, et al., 2023). This paper critically examines the emergence of systemic EdTech testbeds as a response to these limitations, positioning them as infrastructures that reconfigure how research-informed knowledge is generated and used.

The paper conceptualises testbeds not merely as sites of experimentation but as environments in which knowledge, practice, and technology are co-developed. In contrast to traditional randomised or laboratory-based approaches, systemic testbeds embed iterative cycles of design, implementation, and evaluation within authentic educational settings, enabling more distributed forms of research-informed knowledge production that are sensitive to context and practice (Vanbecelaere et al., 2023). However, claims of "democratisation" require critical scrutiny. Testbeds may reproduce existing power asymmetries if governance structures, data ownership, and methodological authority remain concentrated among institutional or commercial actors.

Through a synthesis of global initiatives and policy frameworks, including emerging national and transnational testbed networks, the paper seeks to identify tensions that might arise when multiple stakeholders meet and co-develop digital technologies for education. Further, it explores the potential of interconnected testbed ecosystems to serve as shared knowledge infrastructures that facilitate the exchange of data, methods, and insights across regions, while raising questions about equity, access, and representation.

Rather than offering definitive conclusions, the paper offers a set of critical questions about what it might mean to democratise research-informed practices in digital learning. In doing so, it invites further inquiry into how systemic EdTech testbeds are designed, governed, and enacted across different contexts, and how these processes shape whose knowledge counts, under what conditions, and with what consequences.

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Learning Sustainability through Design Thinking and Place-Based Experience

Eng Ying Bong

Singapore University of Technology and Design (SUTD), Singapore, Singapore

Sustainability science education often emphasizes scientific knowledge to address environmental challenges, water resources, and energy systems. However, many sustainability challenges, such as resource depletion, biodiversity loss, and pollution are closely shaped by geographic location and cultural context. In Education for Sustainable Development (ESD), design thinking has been recognised as a useful approach for supporting interdisciplinary and action-oriented learning (Leal Filho et al., 2024; Schmidberger et al., 2024). Students enrolled in the Science for a Sustainable World course have the opportunity to participate in a short, overseas immersive trip programme that provides practical, real-world exposure to sustainability issues.

During the pre-departure briefing, a humanities faculty member introduced the local social, cultural, and political context. This helps students approach the field experience with greater awareness. On-site, students identified sustainability challenges such as local waste management, water and energy supply. Through direct engagement with local residents and stakeholders, they began to see how these challenges are experienced on the ground, and how solutions should be shaped by local constraints and practices.

Design thinking was also introduced as a guiding framework to help students understand stakeholder perspectives and identify local needs. In the initial stage of the design thinking process, students communicate with the resident to understand their needs, followed by defining the problem. These steps help to develop a place-based solutions that respond to specific social, cultural, and environmental conditions. As noted by Leong et al. (2024), this approach helps students work identify real-world sustainability issues through iterative problem framing and solution development.

This study employed a structured methodology consisting of pre- and post-trip surveys to evaluate changes in students' perceptions of tackling sustainability issues. The findings suggest that combining place-based learning with design thinking and stakeholder engagement supports more critical and holistic approaches to sustainability problem-solving. It also helped students move beyond generic solutions and think about responses that better fit the local context.

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PAPER ABSTRACTS: PARALLEL SESSION E

From Spectacle to Sanctuary: Reconfiguring Participation Through Multimodal Learning Ecologies in Creative Higher Education

Marie Genevieve Cyr
Istituto Marangoni Dubai, Dubai, United Arab Emirates

Situated in the United Arab Emirates (UAE), and informed by the early spring 2026 disruptions across the Gulf Cooperation Council region, this paper proposes multimodal, place-responsive learning ecologies as a design-oriented pedagogical framework for creative higher education. It argues that contemporary pedagogy unfolds within conditions shaped by AI-driven infrastructures, informational saturation, blended realities, and intensified regimes of visibility, speed, and instability. Within this landscape, participation is too often equated with performance: constant presence, fluent critique, accelerated production, and polished outcomes. The paper contends that such norms narrow what counts as engagement and risk reproducing the very logics of exposure, abstraction, and measurable productivity that pedagogy might instead seek to challenge.
Drawing on a multimodal learning design framework, the paper reframes the studio not simply as a site of production, but as a pedagogical ecology in which participation is constituted through time, space, rhythm, material relations, and modes of attention. Positioned at the intersection of embodied pedagogy, experimental studio practice, multimodal meaning-making, and practice-based research, it asks how creative learning might be redesigned under conditions of distraction, infrastructural opacity, and technological excess. Its central claim is that participation is not an individual trait, but a situated and uneven accomplishment produced through the interplay of bodies, environments, temporalities, pedagogical arrangements, and institutional norms of recognition.

The theoretical framing draws on Hiroki Azuma's figure of the tourist to reconceptualize the learner as a subject in transit: mobile, contingent, and meaning-making through encounter rather than mastery. Through the author's CTRL+BREATH framework, breathwork, movement, reflective writing, embodied draping, mindful deconstruction, and movement-to-pattern translation function not as supplementary activities, but as epistemic tools. These practices enable students to translate technological abstraction into embodied inquiry and to engage learning through body, gesture, environment, materiality, and reflection.
The paper further proposes the stabilizing multimodal studio as a pedagogical model for volatile contexts. Drawing on research as play and spiral learning, it supports inquiry through interruption, nonlinear making, translation across media, iterative feedback, and reflective return. Its contribution lies in offering a theoretically grounded and practice-based framework for rethinking participation, engagement, and rigour in creative higher education. More broadly, it argues for the studio as a carefully designed learning ecology capable of sustaining deeper, more ethical, and more resilient forms of creative participation in the contemporary landscape.

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Azuma, 2023; Crawford, 2021; Höök, 2018; Kolb, Tavin, and Tervo, 2021; Selander, 2022; Shusterman, 2008.

Letting Dance Teach. Dance Teaching as aesthetic teaching in an aesthetic turn in education

Paul Moerman

Dept. of Music, Art and Culture Studies, University of Jyväskylä, Jyväskylä, Finland. School of Educational Sciences, Södertörn University, Huddinge, Sweden

This paper forwards dance and the arts as indispensable to education, educational research, and teaching and learning designs for a precarious future already here, a world calling for social and natural survival. Underlying the arguments is an inquiry into what dance and the arts can 'teach' us about teaching and learning, and about education as an endeavour to enter into a dialogue with the world.

The paper highlights dance's intrinsic educational value and the deeper educational relevance of teaching dance, modelling dance teaching as a mode of aesthetic teaching in an overall plea for an aesthetic turn in education. Aesthetic education is seen as an education taking the arts seriously as specific sources of insight, knowing and meaning-making. Aesthetic teaching conceives teaching modes taking the work of the senses seriously, 'beyond' controlled instruction and measurable outcomes, designed to letting the world reveal itself aesthetically (Herbart).

The phenomenal world is viewed as subject offering its 'gifts' to the human 'I', receivable primarily through the senses (Biesta, Marion), and the human subject is seen as becoming in aesthetic and ethical receptivity of who and what is other (Arendt, Levinas), including the yet unknown and even the possibly unknowable. In specific teaching and learning situations, designed dance activities establish the didactic triangle (Herbart, Marton & Tsui), catering for collective exploration and (kin)aesthetic experiencing (Dewey, Stinson) of creative dance, and linguistic, mathematical or scientific curriculum subject content.

The paper compiles findings from qualitative and quantitative studies on teaching creative dance, language, math and science (Moerman). Dance teaching as a mode of aesthetic teaching, bringing the work of the senses to the fore while preserving the integrity and the freedom of the student's 'I', summoned to receive the 'gifts of teaching' (Biesta), is found to challenge cognitive, constructivist metaphors of knowledge acquisition, the aesthetic work preceding – and enabling – cognition, emotion, interpretation and meaning-making (Roth).

Digital Materiality and the Making of Authenticity in Museum Exhibitions

Fredrik Lindstrand & Eva Insulander

Konstfack, Stockholm, Sweden. Stockholms Universitet, Stockholm, Sweden

Digitization has had a profound and transformative impact on museum practices in recent years, reshaping how cultural heritage is accessed, interpreted, and communicated (Arvanitis & Zuanni, 2021). While museums have long relied on tangible artefacts to establish connections to the past, digital technologies offer new resources through which museums can construct a sense of connection to history. In this presentation, we present the findings from a project that investigated digital materiality in museum exhibitions. It examined how digital media contributes to meaning-making and the rhetorical construction of authenticity in contemporary cultural-historical contexts.

Empirically, the project built on a series of workshops and case studies conducted in collaboration with the Swedish National Maritime and Transport Museums: The Vasa Museum, Vrak – Museum of Wrecks, the Naval Museum, and the Maritime Museum. These workshops functioned as spaces for cross-professional dialogue involving curators, educators, exhibition designers, and researchers. Together, they analysed examples of digital media in exhibitions, focusing on the affordances of digital materiality and the ways in which it shapes both visitor positioning and the interpretive possibilities of displays. Theoretically the project built on multimodal social semiotics (Kress & van Leeuwen, 1996/2021), and concepts such as modality markers were used to illuminate how authenticity and historical validity are signaled through semiotic resources including colour, light, contextualization, depth, and digital simulation. Inspired by discussions of aura and authenticity (Benjamin, 1935/2008), the project investigated how digital representations—such as high-quality reproductions, augmented reality, and virtual environments—create links between past and present. These links become part of the museum's rhetorical work as it seeks to bring history to life.

The results comprise both empirical and theoretical findings. Findings show that the digital provides objects and environments with a (simulated) materiality that adds discursive layers to representations. Digital materiality is plastic and flexible: it can mimic other modes and materials, assume their properties, and consequently reproduce their epistemological framings. This plasticity enables shifts in how objects are presented and how visitors are invited into the historical narrative. Digital media also play an increasingly important role in museums' meta-representations of themselves, contributing to aesthetic enhancement and institutional identity. Furthermore, digital tools can facilitate access to fragile, inaccessible, or ethically sensitive heritage, expanding inclusion and enabling new kinds of questions to be asked. A theoretical aspect involves the development of ideas concerning multimodal ensembles and how different modes and media interact within them. More specifically, we have developed the concepts of media specialisation and media synchronisation.The project contributes conceptual and practical tools for interdisciplinary collaboration in exhibition development. These tools support informed decision-making in a rapidly evolving technological landscape. Ultimately, the project highlights how digital media may shape not only engagement of visitors but also broader museum narratives about authenticity, authority, and the relationships between past, present, and future. This presentation is based on a project funded by The Swedish National Heritage Board, which ran between 2023-2025 (Insulander & Lindstrand, 2025).

Recognising Student Agency and Signs of Learning in Educational Contexts

Henrika Florén & Sophia Diamantopoulou

Karolinska Institutet, Stockholm, Sweden. UCL Institute of Education, London, United Kingdom

This presentation addresses Social Semiotic methodological considerations regarding how agency and signs of learning can be identified, analysed, and interpreted, in student-created multimodal texts. Drawing on Multimodal Social Semiotics (MMSS) as a theoretical and methodological framework (Bezemer & Kress, 2016; Kress, 2010) we approach learning as a semiotic process that becomes materially realised in multimodal texts that students create in response to pedagogic tasks. From this perspective, learning is understood as recoverable and observable through students' semiotic choices. We argue that, through a systematic MMSS interrogation of data with agency and pedagogic discourses as points of reference, researchers can uncover any signs of learning. Through this interrogation we identify markers in student-created multimodal texts which index signs of learning. Anchored on a Social Semiotic understanding of learning—as a process of transformative engagement with the world through semiotic resources (Bezemer & Kress, 2016) and as a social practice (Kress et al., 2021)—we elaborate on analytical and interpretative approaches for making visible any signs of learning. We on our recent work on the operationalisation of MMSS through a systematic four-component analytical model (Diamantopoulou & Florén, 2025a, 2025b) as well as our unpublished article about MMSS understandings of Learning (Florén & Diamantopoulou, 2026). To illustrate the approach, we use a student-created film from an empirical study (Florén, 2026) from a Swedish Higher education context. We showcase how the methodological framework can be used in educational research to recognise learning within social and institutional contexts. Further, we add to Kress's definition of learning as agentive engagement by attending to students' agency as compliance with or endorsement of pedagogic discourse, including students' discursive and epistemological positioning (Diamantopoulou, 2024). The focus is placed on students' learning as materialised meaning making, and on teachers' recognition as a key condition shaping what counts as learning within educational institutions.

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Design for Learning in STEM in Science Centres' Visual Communication

Maria Sparf
Department of Behavioural Sciences and Learning (IBL), Linköping, Sweden

This study explores how the visual communication of science centres contributes to shaping meanings about learning in STEM (science, technology, engineering and mathematics). Photographs on science centre websites are approached as semiotic resources that, much like texts, communicate ideas about what STEM is, who it is for and how learning may take place. Drawing on Design for Learning (DFL) (Selander, 2022), the images are understood as representations of a designed framing for learning. They are not neutral but selected to communicate particular values, ideals and assumptions about what STEM is, who it is for, and how learning can take place.

The study combines DFL with an analytical perspective inspired by WPR (What's the Problem Represented to be?), developed by Bacchi (2009). WPR was originally developed for policy analysis and is based on the premise that the measures proposed in a policy reflect which aspects of reality are defined as problems and therefore considered in need of change (Bacchi, 2012). In this study, the approach is used heuristically to analyse the visual communication of science centres. Although the images do not express explicit problem formulations, they may indirectly signal which challenges or needs the activities aim to address. With DFL as the theoretical framework, the study uses an analytical lens inspired by Rahm and Rahm Skågeby (2023), whose work with WPR has informed the combination of DFL and a WPR-inspired perspective in this analysis. By examining which activities, environments, and people appear in the images, it becomes possible to read between the lines and identify the problems that the representations implicitly respond to. The analysis pays particular attention to the assumptions about STEM engagement, recruitment and target groups that the images address, as well as what is taken for granted or rendered invisible.

In this way, the photographs are not treated merely as marketing material but as representations of potential learning resources and as indications of underlying issues that science centres seek to influence. The study, therefore, also examines which audiences are made visible and which are absent, as well as the culture of recognition (Selander, 2022) related to STEM content that emerges in the visual communication of science centres.

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Supporting Teachers as Designers of Culturally Relevant Design-based Geometry Challenges

Saadeddine Shehab & Gloriana González
University of Illinois at Urbana-Champaign, Champaign, United States

Implementing design-based challenges in K-12 classrooms is an opportunity to engage students in applying disciplinary concepts and addressing relevant social and cultural issues. Culturally relevant design challenges can foster empathy development during STEM lessons (Koskinen, 2023). Nevertheless, teachers require support to design and implement these challenges while attending to their students' needs. In our work, we build on the synergies between Lesson Study and Human-Centered Design (HCD) to support teachers as designers of learning. Through this integrated model, we engage middle and high school mathematics teachers in collaboratively co-designing and prototyping design-based geometry challenges. In this study, we ask: how did high school mathematics teachers design a culturally relevant, design-based geometry challenge for their students?

To answer the question, we used a qualitative case study approach to examine a professional development that consisted of five 2-hour synchronous sessions and four 30-minute asynchronous sessions. In the first session a team of two researchers and three high school mathematics teachers studied three design-based geometry challenges that the researchers created following a framework developed by Authors (2024). The framework is based on three research supported perspectives: 1) the challenges must be supported by the curricular standards, 2) the challenges must be guided by a design thinking model, and 3) the challenges must address a problem that is relevant to them and their communities. Each challenge had information and scaffolding prompts to facilitate students' engagement and application of geometry concepts during the challenge. Following this session, the teachers individually selected their favorite challenge and analyzed it using both a human-centered design lens and a social justice oriented mathematics framework.
During subsequent synchronous sessions, the team converged on one challenge as a starting point, then brainstormed and planned a final challenge entitled "Designing Textile Patterns". They anticipated students' thinking before one teacher implemented the challenge and the research team collected video recordings. Between sessions, teachers engaged in asynchronous activities including enacting the challenge using a design kit, developing a math-design map, and reflecting on the design process. In the last session, the team reflected on students' thinking during the challenge through video recordings.
Findings highlight key supports needed to empower teachers to design such challenges. Teachers benefited from exposure to concrete examples, structured opportunities to analyze and enact challenges, and the use of design templates aligned with a design thinking model. Collaborative design spaces enabled teachers to navigate uncertainty, refine ideas, and ground decisions in their students' contexts. By discussing contexts where the lessons were implemented, the teachers adapted various phases of the challenge for instilling students' empathy about their cultural practices. Additionally, tools such as math-design maps supported teachers in anticipating student engagement and connecting disciplinary content to the design process. Reflection across the professional development was critical in building teachers' confidence and capacity as designers of culturally relevant learning experiences.

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Students As Designers: A Method for Tracing Mathematical Learning During Modeling Design Challenges

Mayahuel Gutiérrez Malik, Gloriana González, Saadeddine Shehab
University of Illinois, Urbana Champaign, United States

The implementation of design based-instruction in K-12 mathematics classrooms is a novel approach in the U.S. (Bush et al., 2018). This approach can engage students in applying problem-solving strategies to real-world problems (Goldman & Zielezinski, 2021). However, it can be challenging for teachers and researchers to assess student learning resulting from their engagement in proposing design solutions. We ask: How can we trace design and mathematical learning during authentic design challenges? By combining a Human-Centered Design (HCD) framework (Lawrence et al., 2024) and a mathematics conceptions framework (Balacheff & Gaudin, 2009), we propose a method for coding and visualizing students' actions during a lesson. Through coding 2-min video segments of student's design challenge solutions for evidence of students' interactions with HCD and mathematics conceptions, we identify overlaps between math and design engagement. We map students' trajectories illustrating their math-design processes through timeline visuals. The method has the purpose of unpacking the interplay between math operations and design processes that constitute evidence of student learning. Teachers and researchers can use the method to anticipate how students would approach a design challenge and assess the learning outcomes of their design solutions. We illustrate the method through the analysis of five design solutions from a zero-waste fashion challenge in a 7th grade math class part of a project funded by the National Science Foundation in the U.S. Fashion design offers a context for middle grade students to conceptualize math through hands-on modeling (Knudsen et al., 2022). Adding a sustainability lens through designing zero-waste garments gives students an opportunity to consider social impact in addition to math and design (Townsend & Mills, 2013). The work has implications for supporting design-based instruction in classrooms as a tool for students to learn math modeling. Our work also supports using design challenges for interdisciplinary student learning. Design contexts like zero waste offer a way to incorporate themes surrounding critical global challenges in K-12 classrooms.

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Exploring Student-Staff Partnership in Higher Education: The Role of Co-creation in Active Learning

Wai Ling Winnie CHIU, Sandy SABAPATHY, Annie KO
The Hong Kong Polytechnic University, Hong Kong, Hong Kong

The online learning platform has been widely adopted in global university education, particularly after the emergence of artificial intelligence (AI). The issue is how to (1) stimulate students' active learning and (2) establish a collaborative learning experience in virtual learning in higher education. The co-creation and blockchain application were adopted in the undergraduate legal course as the pilot test in the study.

The adoption of co-creation in higher education has been emerging and developing, though rare, in tertiary education (Pee 2019; Doyle, Buckley, and McCarthy 2021). The research indicates that both educators and students can benefit from co-creation practice. The construction of Multiple-Choice Questions (MCQs) designed by students is considered one of the co-creation activities (Doyle, Buckley, and McCarthy 2021). Palmer and Devitt (2006) suggest that designing MCQs can be a learning method that stimulates students to learn and understand a topic. Students need to understand the relevant learning material before and during the drafting process of MCQ (Draper 2009; Galloway and Burns 2015).

To establish students' collaboration learning experience in the co-creation of knowledge among students, we introduced the co-creation activity called Multiple-Choice Question Challenge ("MCQ Challenge"). The students are required to plan and co-create multiple-choice questions after reviewing the teaching materials. To encourage students' active learning, stimulate their motivation in virtual learning, and increase engagement, each student participated in the MCQ Challenge, which included five randomly assigned questions co-created by their classmates on the online learning platform.

After completing the online MCQ Challenge, the student could click on their own wallet ID, which was developed on the blockchain-based platform as a pilot test. The students can check the digital coins they earned via the blockchain-based platform. The digitalisation of the reward mechanism can be achieved by checking the digital coin as a trial. This acts as a tangible indicator to quantify the students' learning engagement in the blockchain-based platform after the MCQ Challenge. The students can explore the innovation reward mechanism through their accomplishment in the MCQ Challenge.

The student engagement in the MCQ Challenge facilitates deep learning and their comprehension of the learning concept (Draper 2009). This study attempts to examine how student co-creation in designing the MCQ Challenge can enhance student active learning, student engagement, and student learning experiences.

Trees as a resource for learning for sustainability in transitions between preschool and school – advancing cross-level collaboration

Susanne Kjällander, Eva Norén, Cecilia Caiman
BUV, Stockholm, Sweden. IÄD, Stockholm, Sweden

Sustainability issues are highly topical worldwide and require urgent attention at all levels of education. In order to renew education in response to changing societal and ecological conditions, there is a need for transformative learning shifts and joint professional growth for sustainability change (Mogren, 2019). This project is grounded in didactic modelling (Wickman, Hamza & Lundegård, 2020; Thalheim, 2010) informed by a pragmatic perspective (Dewey, (1938/1997) and design theory (Selander, 2008) to analyse and illustrate the meaning-making processes involving children and educators in preschool, preschool class, primary school and school-age educare. Applying didactic modelling makes it possible to utilise and systematise the different educational expertise refining teaching as well as contributing with new research insights. This paper presents empirical material from the part of the HOW project in which transitions between preschool, preschool class, and lower primary school/school-age educare were developed and studied. The methodological approach consisted of video ethnography and interviews. Ethical consent was obtained from both parents and children. The project was initiated within the school's development group, in which teachers from all sectors were represented. It was designed collaboratively and included, for example, excursions, correspondence, studies and aesthetic and multimodal (Kress, 2010) expressions related to different parts of trees, storytelling, photography, film, and play. Data were generated through video recordings of groups of children and through the collection of their work in the form of drawings, films, nature installations, and texts. The overall purpose was to enhance collaborative learning, cooperation, and engagement for sustainable development across age groups and school forms. The findings show that: (1) teaching and pedagogical content converged into a shared instructional focus aiming for supporting children's agency and explorations (2) several proximate purposes were formulated through professional cross-level collaboration, proximate activities for children to act on continuous with the overall purpose of engaging with local biodiversity 'tree ecology' through hands-on inquiries and aesthetic practices; and (3) several teaching vignettes of cross-level collaboration were developed and grounded in children's questions.

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Squirrels and extended communication for sustainability and digital exploration

Susanne Kjällander, Cecilia Caiman, Eva Norén
BUV, Stockholm, Sweden. IÄD, Stockholm, Sweden

The HOW-project addresses a real and pressing challenge: we are facing a deepening ecological crisis as human activity continues to deplete Earth's resources (Rockström et al., 2009). In response, education for sustainability must be further developed so that children can build engagement and sustainable habits. This calls for didactic transformation that supports both present and future generations. Education should draw on knowledge from different disciplines while also recognizing values as part of the learning process (Dewey, 1934/1980). Creativity and innovation, alongside established habits and ways of acting, will be essential in addressing sustainability challenges in education. In this context, everyone's participation matters: each individual's ecological footprint counts, and collective efforts are necessary for sustainability work, in ways that are also closely linked to democracy and citizenship education. The youngest citizens, children, have the right to genuine democratic influence in relation to sustainability issues, a right that is also consistent with intergenerational justice. The project aims to safeguard the youngest citizens and make their voices visible through both verbal and non-verbal forms of expression. Method were video ethnography and interviews and ethical consent was obtained from parents and children, on both video recordings and collection of drawings, films, nature installations, and texts. In the term-long project, the teachers and a mother-tongue-teacher designed for children's learning through different languages, TAKK, images, and physical and digital tools. Over this extended period of time (cf. slow science, Stengers, 2018), children designed in learning (Selander, 2008) while engaging multimodally (Kress, 2010). The project was initiated by the children's attentive interest in encountering two squirrels during an excursion: a firsthand experience of nature and a direct encounter with the natural environments (Sandell & Öhman, 2010). The group transformed and transduced (Kress, 2010): took photographs, made drawings, created cartoons and scripts, crafted their own squirrels from toilet rolls, wrote letters, texts, and stories, translated and sang songs, produced their own stop-motion films, and built and decorated a wooden squirrel house with furniture and food, which they then installed in nature. This project unfolds how children develop engagement with the squirrel's well-being, and what characterizes teachers' didactic work in fostering this multimodally with inclusion and learning as participation (Dewey, 1938/1997) and children's voices were thus made heard in society. Their work was also highlighted in an exhibition to which the whole school, all parents, and the entire village were invited.

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The true, the beautiful and the good - Ellen Key's pedagogical ideals and aesthetic values in the older seminar tradition reflected in contemporary teacher education

Marianne Liljas & Jörgen Dimenäs
Dalarna University, Falun, Sweden

The concept of Bildung has been interpreted as elusive and has been considered to categorize people as either educated, uneducated, or uneducable. The classification, which is a construction of a class society with large population differences, had a major impact on teacher education at the elementary school seminars. Bildung was considered unnecessary for teachers of working-class children and the rural population, which was used as an argument to actively withhold educational elements from elementary school teachers. The loss of Bildung that came to characterise the seminary tradition was questioned during the 19th century's reform spirit by an alternative view of education that was based on the child. One of the most critical voices was Ellen Key, and another voice critical of reform was Fridtjuv Berg. Strong philosophical ideas in the following period were also described by Rousseau, Fröbel, Pestalozzi, Dewey and Montessori.
In today's debate, voices are being raised about the return of Bildung. Behind the criticism is the measurable school, which is considered to have reduced learning to "teaching for the test". The result highlights the meaning of education in terms of deeper knowledge processes of a more lasting nature. Ekstrand and Nordin (2007) point out how the goal-oriented school reduces the curriculum's Bildung oriented aspirations. Considering the problems articulated in the contemporary research debate, we have seen a similarity with those identified by Ellen Key at the beginning of the 20th century. The purpose of this study is to deepen the knowledge of the seminar tradition of Swedish public schools reflected in contemporary teacher education through an analysis of Ellen Key's texts on pedagogical ideals and aesthetic values.
The study's questions:
What critical voices about school are conveyed in Ellen Key's texts from the perspective of the turn of the 20th century?
What relevance does it have to a contemporary teacher education perspective?

One of those who in recent times has presented the meanings of education with the support of Key is Anders Burman (2014; 2025). Ahlskog (2021) raises the question of what kind of Bildung we need in relation to democracy, humanity, popular education, transdisciplinary education, historical reviews, and ecological ideas. Kjellson (2022) has approached Bildung in a contemporary, practice-oriented context and identifies how different types of curricula can both promote and limit aspects of Bildung. The present study aims to contribute with in-depth knowledge where we can demonstrate relevance in relation to Key's early texts.

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From AI Search to Scientific Scrutiny: A Design-Based Study in Higher Education

Eva Svärdemo Åberg, Michael Håkansson, Caroline Ignell, Eva Edman Stålbrandt
Stockholm University, Stockholm, Sweden

The ability to search for, critically evaluate, and apply scientifically grounded information is a crucial skill in higher education. This is especially important for student teachers, who must develop academic literacy skills to learn how to engage with scientific texts when writing essays (Lea, 2004). In an era of artificial intelligence (AI), which is transforming how we search for information, it is essential to provide students with practical tools to develop effective search strategies. This is particularly important in teacher education, where information searching is a primary objective of the degree program and vital for students' future professional practice. AI resources challenge teaching and assessment practices, placing new demands on students' ability to critically examine and apply the information they obtain through these tools (2024; Huang & Huang, 2024). In this presentation, I will highlight observations from on-going design project, particularly regarding how traditional and AI-based learning resources support students' gradual participation and engagement in academic practices. I will discuss how different learning resources influence the development of a scientific approach. Through a design-based research project (McKenney & Reeves, 2019), we collaborated with course teachers to design a template for critically reviewing scientific articles. Students used the template when searching traditional databases and an AI resource (Keenious), which was made available through the university library. Through participant observations, interviews, survey responses, course evaluations, and analysis of approved student assignments related to the search task, we examined the application of this template in information retrieval. Our research design was iterative and theoretically based (Davies, 2013; Wenger, 2009). By modifying the teaching instructions and the template, we gathered experiences that contributed to an understanding of how learning resources support students' information retrieval and the development of scientific approach. This study was conducted within an undergraduate-level methods course. Preliminary findings suggest that teachers play a central role in helping students develop a scientific approach. Teachers are essential in helping students understand what constitutes a quality critical review of scientific articles and in supporting them as they compare the AI resource to other search tools. Students have difficulty identifying and assessing the value of the large number of studies produced, especially when using the AI resource. We discuss the need for students to have time and teacher support in order to understand the quality dimensions in the review template and develop a scientific approach. One conclusion is that procedural knowledge is equally important as the final written product assessed by teachers.

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WORKSHOP ABSTRACTS

Between Storytelling, Theory and System: A Dialogic Experiment in AI and Ethical Inquiry

Patricia Kovic

Otis College of Art and Design, Los Angeles, United States

This workshop invites co-inquirers into a live, participatory experiment in ethical inquiry about artificial intelligence. It focuses on how ethical understanding can be shaped by educators while AI systems are still in a formative process. Situated within NGB (neighborgapbridge.com), a practice-based framework for designing experimental learning environments and tools, this workshop invites students, educators, museum curators, educational leaders, and policy makers to bring AI questions about authorship, responsibility, bias, and automation from their own areas of study or expertise. The workshop facilitator will enter these questions into a custom built "Ethical NGB GPT" and explore them with participants in real time — not to produce conclusive answers but to open up a less scripted space for conversational inquiry.

This “Ethical NGB GPT” was intentionally designed to be playful and hybrid. Trained on both children’s moral fables and classical philosophical texts, it shapes an unexpected and ambiguous space that invites nostalgia, criticality and reconsideration. This moment of ambiguity and temporary disorientation takes us outside the familiarity of formal education, inviting us to toggle between narrative intuition and critical reasoning. Within this new experimental, social space, participants are able to reflect on underlying AI questions of knowledge, power, design, and institutional context— approaching these ideas with a degree of openness and curiosity not always available in more fixed learning environments.

Inspired by Simone de Beauvoir’s The Ethics of Ambiguity, this workshop approaches ethical understanding not as an abstract principle, but as something that emerges through human dialogue, thoughtful design, and joyful inquiry. As humans, we will always be navigating ethical uncertainty. Ethical understanding is not something we arrive at, but something we practice — together.

Innovative Approaches to Ideation in Learning Design: Combining the Creativity of Playing a Co-operative Board Game with the Divergent Capabilities of AI

Ola Knutsson, Mikkel Godsk, Tomi Kauppinen, Kolbrún Friðriksdóttir, Kari Bjørgo Johnsen

Department of Computer and Systems Sciences, Stockholm University, Stockholm, Sweden.
Centre for Educational Development, Aarhus University, Aarhus, Denmark.
Aalto Online Learning, Aalto University, Espoo, Finland.
Icelandic and Comparative Cultural Studies, Reykjavik, Iceland.
UiB Learning Lab, University of Bergen, Bergen, Norway

In this workshop, we invite educators to play the Learning Design (LD) Game, a board game we have been iteratively designing and developing in our Learning Design project. We argue that a playful approach has significant potential. Indeed, the core ambition of Learning Design practices is to support the sharing of and learning from educators' effective designs for learning (Dalziel et al., 2016; Dohn et al, 2019). However, existing methods rarely equip educators to share their learning designs (Knutsson et al, 2025). For this, we have designed the Learning Design Game to specifically support a designerly approach to educational development to reflect, capture, and share design ideas for learning.

In the first part, workshop participants are divided into groups of three to four people to play the game. Student participation is appreciated, but student perspectives will also be provided through events during the game. The Learning Design game will enable players to gain insight into crucial aspects of teaching and learning, but also to reflect on their own experiences from past or current courses. As part of the game, players will be writing reflections. In practice, these reflections are on a template filled with notes, organised into four sections: Active Learning, Student-Centred Learning, Constructive alignment, and Sustainable Learning Design.

The second part of the workshop will take the written reflections and played cards as input to come up with actionable steps and a draft of an improved learning design for their course. This will be supported by a AI Learning Design Companion, a tooling for educators to structure and reshape their initial learning design to meet the needs of learners.

We will provide 1) the game boards, cards, time pieces, 2) online tooling, and 3) onsite facilitation to support players to carry out the workshop activities with their peers. As takehome, the participants will have the learning design with prioritised action points. When they wish, they can also share the outcomes with the world via selected platforms and channels, thus sparking inspiration for our community of design thinking educators.

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National initiatives and local AI-solutions: Chatbots as designs for learning

Vidar Skogvoll, Øystein Gilje, Jakob Damgaard, Sara Kyndi, Katarina Sperling, Per Joelson, Mika Setälä, Jessica Salminen-Saari, Alex Kirchberger

University of Oslo, OSLO, Norway. University College Copenhagen, Copenhagen, Denmark. Uglegårdsskolen, Vallensbæk Municipality, Vallensbæk, Denmark. Norrköping Municipality, Norrköping, Sweden.
City of Lempäälä, Lempäälä, Finland. Studeo, Helsinki, Finland. European Schoolnet, Brussels, Belgium

Generative AI has emerged "bottom up" in schools. Students started experimenting with the technology long before teachers did, as ChatGPT and other tools arrived through the spontaneous actions of students (Klopfer et al., 2024). While this technology has shown some potential to help students learn better, many students instead use it to bypass the cognitive effort required for learning. If we do not sufficiently guide and scaffold student AI use, we risk widening the gap between students who are able to monitor their own learning and those who are not.

This workshop gathers policymakers, researchers, and schoolteachers across four Nordic countries to share successful strategies for transforming these newly arrived technologies into pedagogically designed solutions. Participants will gain hands-on experience with teacher-designed chatbots, concrete examples of classroom use cases, and insight into how the different Nordic countries are positioned in this emerging field. The workshop is organized in three sessions, framed around two central pedagogical questions: how can teachers and students use generative AI together in the classroom, and how should students work with AI on their own to ensure learning?

First, the workshop opens with a brief introduction of the key pedagogical concept: the teacher's ability to write a pre-prompt that shapes how an AI chatbot interacts with students. This is followed by short presentations from each country, illustrating the status of generative AI in schools and demonstrating their respective solutions. In Oslo (Norway), Oslo Municipality's solution KI Osloskolen offers a chatbot platform where teachers design chatbots for specific curriculum purposes. In Denmark, SkoleGPT provides a free, open-source environment for students and teachers to explore AI in K-12 education. In Finland, Studeo's Ainstain is a mathematics assistant integrated into digital textbooks, offering stepwise hints rather than direct answers. In Sweden, where no national AI policy for schools exists, teachers are experimenting with tools within existing ecosystems such as Google NotebookLM, and we will present one solution from a municipality working with this tool. In addition, a representative from European Schoolnet will also place these Nordic initiatives in a broader European context.

Second, the core of the workshop is a hands-on session where participants will be given access to one of the Nordic chatbot services and tasked with designing their own pre-prompts for classroom scenarios. Working in groups, participants will then test each other's chatbots and reflect on what works and what does not. This leads into a discussion of best practices for using chatbots in a teacher-student classroom environment. Finally, we move to what the student can do alone: how chatbots can help students develop metacognitive skills. This final part of the workshop is discussion-based, structured around the question: “what are the important metacognitive skills we need to teach students for them to use AI productively?”
We aim to have participants retain access to the chatbot services after the workshop, enabling participants to present solutions to colleagues at their own institutions.

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SYMPOSIUM ABSTRACTS

Symposium 1: School development and AI-literacy: tensions, contradictions and policy in the Scandinavian countries

Johan Lundin, Øystein Gilje, Anna Åkerfeldt, Thomas Hillman, Marie Olafsen, Arne Bergan, Anders Mørch, Mattias W Hugherth, Per Anderhag, Andreas Binggeli

University of Oslo, Oslo, Norway. Linköping University, Linköping, Sweden. Asker Municipality, Asker, Norway. Stockholm university, Stockholm, Sweden. University College Copenhagen, Copenhagen, Denmark

AI in Nordic education policy is marked by a clear contradiction between strategic ambition and pedagogical restraint. On the one hand, AI is associated with renewal, innovation, and future-oriented competence. On the other hand, schools are expected to protect core educational values, exercise caution, and respond to uncertainty around digital technologies. In the Scandinavian context, this tension is intensified by strong local responsibility for school development. National agendas are therefore interpreted and enacted unevenly across municipalities and schools.

Consequently, AI enters education through competing expectations: transformation and stability, innovation and caution, opportunity and control. This symposium addresses these tensions through the lens of school development and AI literacy. Since the introduction of generative AI and ChatGPT at the end of 2022, educators and institutions are increasingly integrating generative AI tools into instructional practices and developing AI literacy courses (Fissore et al., 2024). Consequently, the approaches to AI literacy in school development have changed dramatically. Throughout the Nordic countries, different decentralised models for research practice partnerships have been implemented in the last decade (Fossetøl et al., 2026; Thorsten, 2022). The aim of these partnerships is to develop competence among school leaders and teachers in lower and upper secondary (Jarl et al., 2025), but also to develop new knowledge on particular scientific aspects around these issues.

The symposium presents four research-practice partnerships projects from Norway, Sweden and Denmark. The projects share an interest in drawing upon the expertise and experience of researchers and practice professionals with the aim of building AI literacy in regional networks of professionals. In doing so, it also points to broader questions about learning in the digital age and to how teachers encounter contradictions when new technologies are introduced into established educational practices (Fischer, Lundin, & Lindberg, 2023; Utterberg Modén, Tallvid, Lundin, & Lindström, 2021).

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Paper 1: AI in school – exploring the development of local policies for AI in schools

Johan Lundin & Thomas Hillman
Department of Applied IT, University of Gothenburg

This presentation reports on a project that is part of a shared development initiative bringing together academia, the regional municipal association, and municipalities in order to create long-term strategic knowledge development around AI in school systems. The project, launched in 2025, explores how school leaders engage with AI as a strategic issue in school development. The development project includes about 10 municipalities of very different size and capacity, ranging from small municipalities without upper secondary schools to large urban systems.

Understanding of the problem is constructed through short surveys and structured discussions with school leadership groups in municipalities. Initial findings suggest that school leaders primarily frame AI in terms of efficiency, automation, and process development, often linked to administration and decision support. At the same time, AI raises questions about legal responsibility, procurement, technical infrastructure, student support, learning, and democratic Bildung. A key tentative conclusion is that inequality appears to be increasing, both between and within municipalities. Different resources, competencies, political priorities, and organisational conditions mean that students' opportunities to be prepared for an AI-shaped society vary considerably.

Paper 2: Stress-testing Bigtech for local practices and competence development

Øystein Gilje, Marie Y. Olafsen, Arne Bergan & Anders Mørch
Department of Teacher Education and School Research, University of Oslo, Asker municipality
Department of Education, University of Oslo

The multi-year innovation project Learning in the Age of Algorithms (LAA) aims to explore how AI literacy can be cultivated within a medium-sized municipality in Norway (Asker municipality). This project consists of two phases. In the first phase, pedagogical ICT advisors, acting as end-user developers, produced several chatbots for students across different subjects. The findings highlight how teachers and advisors can take on the role of end-user developers of AI tools (Mørch et al., 2025). This approach may empower teachers to tailor AI tools to their specific classroom needs, fostering sustainable and personalized learning environments while enhancing their capacity to act autonomously.

This presentation focuses on the second phase of the LAA project, with a particular focus on how Asker can work with the new model LearnLM, with tools like Gems, Gemini, NotebookLM, and Read Along within the core services of Google Workspace for Education. These services are available for the municipality but will not be rolled out before they are tested. The LAA project aims at customizing resources and admin controls for the local needs, instead of using the existing resources provided by Google. The aim of testing LearnLM is to support the local risk assessment according to GDPR and the AI Act and to gain insights into what

competence development is needed for teachers, which age groups the services should be available to, and what information would be useful for the students' guardians.

The methods used in the testing involve a teacher-user and a student-user, with two teachers working in pairs on two devices. Each user writes the same prompt in Gemini or NotebookLM and reads the initial response. The core of the test is to "nudge" the model two to three times using emotional pressure, time constraints, or confrontation. This sequence is repeated in a new dialogue to check for consistent results and then replicated in a pre-prompted Gem to see whether safety guardrails and pedagogical instructions are less prone to hallucinations than in a regular Gemini chat. All project participants are systematically instructed, and every result and observation from the stress-testing protocols is documented in a spreadsheet to standardize data collection and ensure that ethical and practical parameters are consistently communicated.
Utilizing a design-based educational research framework (McKenney & Reeves, 2019), the LAA project investigates competence development among teachers and school leaders in the municipality. Data are collected from eight workshops involving more than 20 participants and consist of screen recordings, audio recordings of teachers' and schoo leaders' conversations, interviews, and a systematic log in a spreadsheet.
The preliminary findings highlight a critical need to enhance AI literacy in educator training to prepare teachers to use GenAI provided by Google responsibly in their classrooms. This study offers insights into sustainable approaches to professional development and curriculum design, emphasizing collective efforts and structured support to foster an informed educational environment and strengthen educational agency among educators and school leaders.

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Paper 3: Exploring the role of generative AI in the classroom – experiences from an exploratory project with teachers

Mattias W Hugerth & Per Anderhag

Education Department, City of Stockholm and Stockholm University, Department of Teaching and Learning, Stockholm University

When generative AI (GenAI) spread through education through the adoption of pupils and teachers, the city of Stockholm through preliminary workshops identified several areas in need of attention. Some of these led to the inception of an exploratory project Generativ AI i undervisning (generative AI in teaching). The two-year project, which ends in December 2026, is a collaboration between Stockholm's education department, labour market department and RISE (Research Institutes of Sweden). It has two aims. First, to explore how generative AI can be used in teaching, and second to increase understanding of how a system that provides GenAI capabilities should be designed to support such teaching. The project is divided into two cycles, with 182 and 112 teachers (from K-12 and adult education) respectively at the start of each cycle, with 41 teachers participating in both cycles.

There were two technological solutions in the project. One, RISE GPT was provided by project partner RISE. The other, made available for cycle two, was TeachGPT: a platform developed by one school on Stockholm (Stockholm Science & Innovation
School), running open-source language models hosted on the school's servers. Participating teachers received training from the project leaders and from the providers of the technical environments RISE GPT and TeachGPT.

In addition to training in the tools and basic GenAI knowledge, participating teachers were given a model for planning and evaluation of learning activities with AI, along with examples of how this model could be used and a template for documenting their plan and evaluation. The model was adapted from the didactic model organising purposes (Johansson & Wickman, 2011). 72 lesson activities (data collection still ongoing at the time of submitting the symposium) has been collected, analysed and summarised, presented back to participants for reflection and discussion, and documented in project reports. Focus for this presentation will be the lessons from cycle two and on the activity theory-based analysis (Engeström & Sannino, 2021) for an upcoming paper.

Preliminary findings indicate that teachers saw both possibilities and risks in using GenAI as a teaching tool. We find that both students and teachers need to develop basic AI-literacy. Teachers to help them design lesson activities and configure AI assistants that can support the design, and students to be able to use the AI assistant productively. We also find that in order to design AI assistants and lesson activities teachers need time to iteratively design, test and improve AI configurations. Finally, language models and AI-systems need to be better aligned with the Swedish language, and with educational needs.

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Paper 4: SkoleGPT, and competence development in one municipality

Andreas Binggeli

Future Classroom Lab, University College Copenhagen, Fclab.dk

In Denmark, the danish organisation Kommunernes Landsforening (The Union of Municipalities) offers knowledge, tools and services regarding AI for all municipalities to use. (KL, 2026) However, Brøndby, one of 98 municipalities in Denmark, has developed its own take on GenAI in schools. In this presentation we will report on how this municipality an urban to Copenhagen has developed a program for school leadership, investing in common understandings and experiences for all teachers regarding AI in schools.
Following principles in research-practitioners partnership (Christensen et al, 2012), the municipality have joined forces with University College Copenhagen (UCC) to co-design a shorter development course, which all schoolteachers in primary and lower secondary get to attend. The course aims at staging introductional

levels of especially GenAI areas, which the teachers can choose from such as meta-communication, large language models, societal issues with GenAI and more explicit work related to teacher practices.
The development process is part a bigger notion in Brøndby Municipality to address the issue of unregulated GenAI in everyday life particularly in children's handling of schoolwork. Moreover, the idea is also to have a joined workforce of teachers share experiences with new technologies instead of continuing regular professional development practises in general of just letting technology counsellors or very few professionals attend these activities often with low dissemination impact at school level.

Evaluating through qualitative methods revolving the development process, UCC in the spring of 2026 will conduct semi structured interviews with stakeholders at municipality, school leadership and teacher level to identify key learnings on introducing GenAI as a whole school (and municipality) approach as well as getting insights of emerging GenAI practices with children. The evaluation will hopefully pave the way for other municipalities to lean towards similar processes as there is no common and national ground on the matter. The presentation will present these evaluative findings.

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Symposium 2: Designing learning with chatbots in secure GenAI ecologies: policy, practice, and teachers' agency

Øystein Gilje, Nina B Dohn, Vibeke Schrøder, Annika A Genlott, Katarina Sperling, Vidar Skogvoll, Kimmo Koskinen, Kaisa Kotomaki, Mika Setala, Juho Helminen

University of Oslo, Oslo, Norway. University of Southern Denmark, Kolding, Denmark. University College Copenhagen, Copenhagen, Denmark. Sveriges Kommuner och Regioner, Stockholm, Sweden. Linköping University, Linköping, Sweden. Finnish National Agency for Education, Helsinki, Finland. Ministry of Education and Culture, Helsinki, Finland. University of Turku, Turku, Finland

Students' use of generative AI services (GenAI) in compulsory schooling poses major challenges for teachers' assessment practices and students' learning (Lodge & Loble, 2026; OECD, 2026). Unlike previous digital technologies, which have been implemented and adopted in schools through local or national projects, ChatGPT and other commercial services have simply appeared on students' laptops (Klopfer et al., 2024).
To meet this development, several national and regional initiatives in the Nordic countries have created different "secure GenAI" ecologies for students in lower and upper secondary schools. These digital environments offer teachers tools to create chatbots, where the technology is "tamed" and deliberately designed for learning. However, the technology is evolving rapidly, and without arenas to share knowledge and experience in safe GenAI use, we risk losing control of how students engage with the technologies they have at hand through the wide range of commercial services.

This symposium will create such an arena by bringing together four Nordic countries and presenting national policies and regional and national initiatives for GenAI. In doing so, we contribute to knowledge regarding two perspectives on current research and development in GenAI in K-12.
First, we ask how different Nordic countries have responded to the emerging use of GenAI in school. Each presentation will provide an overview of AI policy in each country over the last three years. Second, we present how teachers design teaching and learning within diverse locally and nationally adopted GenAI environments for K–12.

Through a cross-examination of empirical studies and practice-based examples from the four Nordic countries, the symposium discusses policy, practice, and teachers' agency. The collective aim is to examine how these GenAI environments are designed and how they can be used in teaching that supports students in becoming more critical of their own use of GenAI tools for learning and for everyday life.
By bringing together multiple perspectives, the symposium provides insight into policy, practice, and future curriculum design in an age of algorithms and a changing geopolitical situation that may give digital development in the Nordic region particular advantages. The discussant will give a critical comment on GenAI as a tool designed for learning.

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Paper 1: Transforming GenAI into 'Nordic' educational technology?

Vibeke Schrøder
University college of Copenhagen

The arrival of GenAI into education poses a wide range of possibilities and challenges. One challenge of commercial GenAI is data security and privacy, and these commercial technologies are not built with education in mind. The Danish Ministry of Education published guidelines on the legal use of GenAI in 2025, and the government appointed an expert group on Big Tech, which has delivered recommendations on how to deal with digital infrastructure from outside of Europe, including in relation to education (Digitaliseringsministeriet, 2024). Moreover, municipalities have teamed up in a consortium – OS2 – to investigate and act on how to be independent of digital technology from the big tech companies, instead aiming at open-source models of infrastructure within a European setting. The Denmark-based Centre for Educational Resources (CFU) has met these challenges through the development of a public GenAI, SkoleGPT, which is entirely open source and physically run and hosted in Denmark.

In this presentation, we focus on the technical development of SkoleGPT into SkoleGPT Science (SGS) and the didactical and pedagogical interactions that co-produce the service and the learning environment.
In a three-year development project (2025–2027), the pedagogical aim is to develop the use of GenAI in science education to support an experimental and dynamic learning environment engaging all students in upper secondary school. The development unfolds through three activities: 1) development of a science RAG (retrieval augmented generation), 2) development of teacher use of SGS for lesson planning, and 3) development of student use of SGS in science lessons and homework. The science RAG will be created from texts on new and emerging knowledge of science education in schooling, e.g. newly published textbooks and digital teaching and learning materials.

Technologies in the classroom are reconfigured in use and take part in the shaping of the learning environment, and the question is what SGS will offer instruction and learning in a Danish/Nordic school context, which values participation, democracy, and creative and constructive learning processes (Fawns, 2022). The questions are: How do we evaluate the quality of the science RAG in relation to the pedagogical values of participation and constructive learning processes? Can SGS play an innovative role in the development of new and inclusive practices in science education? (OECD, 2026).
These questions will be discussed based on the experiences of the development consultants and data from a mid-term evaluation: a survey on the use and practice of SGS among teachers and students conducted in spring 2026.

The analysis of the data will reveal initial insights into how teachers and students experience the use of GenAI in science education that is designed for learning as a non-commercial public AI. What does the use of SGS offer in relation to teacher lesson planning and innovative designs for learning, and in relation to student engagement and inclusion?

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Paper 2: Governing Generative AI in Swedish Schools: Designing for Equity in a Decentralised Education System

Annika Agélii Genlott & Katarina Sperling
SALAR, Sweden, Linköping University, Sweden

Sweden published its first comprehensive national AI strategy in February 2026. The strategy acknowledges the education sector, yet references to compulsory schooling remain brief, high-level, and primarily oriented towards future digital inclusion and AI literacy in upper grades. In practice, this leaves the organisation, governance, and everyday handling of generative AI (GenAI) to municipalities and independent school providers, consistent with Sweden's strong tradition of local autonomy.

From a Designs for Learning perspective, local autonomy is not in itself problematic. The central challenge concerns how conditions for teaching and learning with GenAI are designed across a decentralised system. National policy frameworks function as key design resources: they shape what becomes thinkable, legitimate, and actionable in local practice. When national guidance is weak or underspecified, local actors must interpret ambitions, define priorities, and build governance arrangements without shared reference points. This risk producing fragmented learning ecologies in which students' opportunities to develop critical and responsible relations to GenAI depend on local capacity rather than common educational commitments. The presentation from Sweden asks how GenAI becomes part of schools' learning designs when national ambitions are articulated, but policy enactment is largely devolved to local actors. Building on research showing that GenAI can enhance task performance without necessarily supporting learning when pedagogical intentions are unclear (OECD, 2026), and studies highlighting how teachers' professional agency is reconfigured in encounters with GenAI (Frøsig & Romero, 2024; Zhai, 2025), we discuss how governance shapes what kinds of learning with AI become possible.

This is particularly pressing considering Skolverket's 2026 report based on ICILS 2023, which shows lower digital competence among students from socioeconomically disadvantaged backgrounds and underscores that access to digital tools does not automatically translate into well-developed digital skills. From a Designs for Learning perspective, the equity implication is clear: without coherent national guidance that positions GenAI-related competence as a shared responsibility for all school providers, existing socio-economic differences risk becoming differences in educational opportunity. Importantly, the argument is not for pedagogical standardisation. It is for minimum national stewardship: policy frameworks and action plans that do not prescribe technologies or methods, but provide shared orientations enabling all school providers to fulfil the compensatory mandate and ensure that every student—regardless of socio-economic background—can develop critical, informed, and responsible relations to generative AI.

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Paper 3: Can customized chatbots in school engage students (or is it just dull)?

Øystein Gilje & Vidar Skogvoll

University of Oslo

From March 2023, big edtech companies enhanced their platforms to support services in secure environments, allowing schools and municipalities to deploy chatbot services using their existing Microsoft or Google licenses. Starting with an end-user–developer initiative in a small municipality on the west coast in April 2023, many Norwegian municipalities developed their local solutions following these protocols (Gilje et al., 2025). These chatbots, activated by pre-prompts crafted by educators and school advisors, engage students in dialogues tailored to their educational needs.

Throughout the same three years, the Directorate of Education in Norway has provided guidelines for the use of GenAI in schools. In addition, a national solution for pedagogically enhanced chatbots is currently (spring 2026) being piloted among more than a dozen local school authorities. However, it is still uncertain whether this solution will be made available at the national level as part of their national policy on GenAI in K–12. Lacking a national solution, the Norwegian contribution in the symposium will present a chatbot solution created by Oslo municipality.

In Oslo, the municipality has developed its own AI system for teachers and students (grades 8–13) called "KI for Osloskolen" (AI for Oslo's schools), where teachers can design / pre-prompt "bots" to meet specific curriculum objectives across various tasks and assignments. Following a case study of research design (Yin, 2018), four classes (ages 14–18 years) in the subjects of EFL, mother tongue, science, and history were invited to participate in the study. A total of 103 students consented to be observed in one specific lesson where they used one of the chatbots that were designed for learning, followed by group interviews just after the lesson. This presentation is based on a thematic analysis (Braun & Clarke, 2022) of the group interviews (n = 18) across the four subject-specific fieldworks. We focus on students' understanding of the differences between the customized school chatbots and the other commercial services they are using, emphasizing three preliminary findings.

First and foremost, when the students can choose, not being restricted by the system or teachers' instructions, they prefer to use the commercial chatbots. Second, they admit that their use of commercial

services emerges as a practice because they do not feel they have time to work with all the different assignments in upper secondary school. Third, even though they understand that the teachers are integrating the chatbots as part of their curriculum design for learning, they find the use of these chatbots somewhat dull. The findings shed light on how teachers and local school authorities can customize and further develop their solutions, underpinning students' learning and teachers' assessment for learning practices.

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Paper 4: AI Policy, Teacher Competence, and Student Practices in Finnish Schooling

Mika Setala, Kimmo Koskinen, Kaisa Kotomaki & Juho Helminen

University of Turku, Finnish National Agency for Education, Ministry of Education and Culture, Finnish National Agency for Education.

In Finland, Artificial intelligence in education – legislation and recommendations and related background material form the foundation for guiding the use of artificial intelligence in the education sector. The recommendations, published in March 2025 by the Finnish National Agency for Education and the Ministry of Education and Culture, are aimed especially at education providers and teachers to support the safe, systematic, and legally compliant adoption of AI services.

Although the adoption of AI tools has not progressed evenly among education providers, many of them have been at the forefront of development and have published their own guidelines, thereby sharing good practices. Faktabaari is a Finnish non-profit transparency NGO that has been promoting digital information literacy for citizens and primarily for teachers for years. The guides published by Faktabaari EDU introduce the basics of digital information literacy and AI literacy. Some of these guides and materials are also available in English, for example AI guide for teachers.

AI as a pedagogical tool in education has been a subject of many government-funded development projects in primary and lower secondary and especially in general upper secondary education. The Ministry of Education and Culture convened an "AI Competence – Researchers' and Experts' Roundtable" series to develop the AI Competence Framework for Citizens. The University of Tampere and the Association of Finnish eLearning Centre are conducting, on behalf of the Ministry of Education and Culture, a study that provides a current and comprehensive overview of how artificial intelligence is used in teaching and learning in primary and lower secondary education. The study first identifies existing uses of artificial intelligence through a literature review. Based on this, surveys have been developed for teachers, principals, and education providers to gather information on the current implementation of AI use practices in Finland. A synthesis and a set of action-oriented recommendations will be presented.

The Universities of Oulu and Eastern Finland conducted an AI survey in 2025 in collaboration with the Finnish National Agency for Education. The survey targeted teaching personnel and leaders in primary and lower secondary and general upper secondary education. The study explores how teachers currently make use of AI and how they would like to use it in the future. It approaches the use of AI from the perspectives of competence, agency, AI literacy, responsibility, and well-being at work.

We also present fresh preliminary findings from a University of Jyväskylä study examining the use of generative AI tools in Finnish upper secondary schools. How do Finnish upper secondary students use generative artificial intelligence in their studies? In which situations is AI used the most, how do students perceive its benefits and drawbacks, and what do they think about the rules governing AI use in schools? The study explores students' frequency of AI use, purposes for using AI in their studies, perceived usefulness and harmfulness, AI-related skills, concerns, and views on what kinds of practices schools should have regarding AI use. The data are based on a large survey of upper secondary students.

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