Digital Childhoods, Multimodality and STEM

SIG convenors:

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SIG members:

For GDPR reasons, individual SIG members are not listed with personal data in this report. The SIG continues to have an active and growing membership, including EECERA members and international researchers with interests in digital childhoods, multimodality, STEM, AI, play, pedagogy, digital technologies, digital leadership, and the impact on children's everyday lives.

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1. Aim of the SIG:

The SIG aims to provide an international forum for researchers, educators, and practitioners interested in digital childhoods, multimodality, and STEM in early childhood education. The SIG supports critical and research-informed dialogue about young children's experiences with digital technologies, digital play, multimodal meaning-making, STEM learning, professional digital competence, ethical pedagogical practices, and the changing conditions of childhood in increasingly digitalised societies.

The SIG seeks to promote collaboration across countries, theoretical traditions, and methodological approaches, and to support the development of high-quality early childhood research that is attentive to children's voices, rights, participation, and lived experiences.

2. Activities 2024-2025:

Publications, meetings, networking, cross-national collaboration, symposiums.

During 2024–2025, the SIG continued to support international networking and knowledge exchange among researchers working in the fields of digital childhoods, multimodality, and STEM. Activities included maintaining communication with SIG members, sharing relevant research and conference opportunities, and strengthening links between researchers with shared interests in children's digital lives, technology-rich pedagogies, STEM practices, and ethical questions related to digitalisation in early childhood education.

The SIG also continued to provide a space for discussion of emerging research themes, including children's digital and multimodal meaning-making, the role of educators in mediating digital practices, professional digital competence, generative AI in early childhood education, and the relationship between digital technologies, play, creativity, and inclusion.

3. Future activities:

Publications, meetings, networking, cross-national collaboration, symposiums

In the coming year, 2025-2026, the SIG plans to continue strengthening its role as an international forum for research, dialogue, and collaboration on digital childhoods, multimodality, AI, and STEM in early childhood education.

The SIG will have an active role in the 34th EECERA conference in Portugal. A key planned activity is a SIG preconference event on 24 August 2026, from 10.00 to 15.00, focusing on digital competence in early childhood education. The hybrid preconference event will address themes such as digital competence for early childhood teachers, children's voices in AI and generative AI practices, the development of children's digital competence, STE(A)M inquiry practices, and technology-enhanced play. Presentations from Norway, Greece, and Australia will ensure vibrant discussions and strong engagement. We have organized five symporia for EECERA 2026.

The SIG also plans to continue developing opportunities for networking, knowledge exchange, and collaboration among members. This may include webinars, collaborative symposia, publication initiatives, and continued sharing of members' research. Particular attention will be given to emerging questions concerning generative AI, children's participation and agency in digital practices, ethical and inclusive technology use, STEM learning, professional digital competence, and multimodal pedagogies.

The SIG will also continue to support early-career researchers and encourage cross-national dialogue between researchers, teacher educators, and practitioners working with digital technologies, STEM, AI, and multimodality in early childhood education.

Publications:

Bourha, D., Hatzigianni, M., Sidiropoulou, T., & Vitoulis, M. (2024). Views of Parents on Using Technology-Enhanced Toys in the Free Play of Children Aged One to Four Years. *Education Sciences, 14*(5), 469 - 486. https://doi.org/10.3390/educsci14050469

Dong, C., Fotakopoulou, O., & Hatzigianni, M., (2024). Chinese Early Childhood Educators' beliefs and experiences around using touchscreens with children under three years of age. *Early Child Development and Care*, 1-16. https://doi.org/10.1080/03004430.2024.2358343

Kewalramani, S., Yang, W., Dardanou, M., & Hatzigianni, M. (2025). *Digital Competence development in early childhood professionals: Harnessing the INSPIRE Model.* Routledge and Taylor and Francis

Hatzigianni, M., Dardanou, M., Fotakopoulou, O., Dong, C., Brito, R., Unstad, T., O'Connor, J., & Cao, S. (2025). Navigating digital integration in early childhood: international perspectives from educators working with infants and toddlers. *European Early Childhood Education Research Journal*, 1–20. https://doi.org/10.1080/1350293X.2025.2557862

Misirli, A., Fotakopoulou, O., Dardanou, M. & Komis, V. (2025). The impact of touchscreen digital exposure on children's social development and communication: a systematic review. *Frontiers in Psychology,* Section Educational Psychology, 16-2025. https://doi.org/10.3389/fpsyg.2025.1613625

Undheim, M., Kucirkova, N., Unstad, T. & Dardanou, M**.** (2024). Tracing the ontological beliefs of Norwegian educators concerning technology use in early childhood education and care. *Technology, Knowledge and Learning*. https://doi.org/10.1007/s10758-024-09733-6

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Granone, F., Jakobsen, D. A., Mjølhus, K., Petersen, J., & Michaelsen, B. (2025). Exploring Creativity and Inquiry through Digital Microscopy : Designing an Exhibition in Early Childhood Education. I: Janna Fuccillo Kook; Katherine Meltzoff; Jessica Mercer Young, Preschool Education in the 21st Century - Innovative Insights, Strategies, and Practical Approaches. *IntechOpen*. ISBN 9781836354215. DOI: 10.5772/intechopen.1012335

Meaney, T.J., Severina, E., Undheim, M., & Granone, F. (2025). Defining professional digital competence of early childhood teachers working with mathematics. *Nordisk barnehageforskning (NBF)*. Online ISSN 1890-9167. *22*. 241-259. DOI: 10.23865/nbf.v22.702

Granone, F., Johansen, M., Knudsen, G., Stokke, M., Pollarolo, E., Reikerås, E. K. L., & Rosenlund, M. R. (2024). «We research with you, not about you» Researchers' and Co-researchers' Reflections on Communication in Inclusive Research Projects. I: Consultori Familiari Oggi. ISSN 1594-1914. *32*. 123-138.

Devi, A., et al. "Innovating Early Childhood Education Through Virtual Reality: A Case Study of Mursion Simulations in Postgraduate Pre-Service Teacher Education." *Immersive Learning in Teacher Education: Simulated Environments, Tools, and Practices,* edited by Wendy May Goff, IGI Global Scientific Publishing, 2026, pp. 177-208. https://doi.org/10.4018/979-8-3693-9861-6.ch006

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Walshe, P., Commins, A., McDonnell, C. & Kelly, B. (2025). 'STEAM from the Start': Proposing a Conceptual Framework for the Development and Implementation of a STEAM Training Intervention for Early Childhood Educators. *European Journal of STEM Education, 10*(1), 11. https://doi.org/10.20897/ejsteme/17156

Walshe, P. (2025). Reflecting on the implementation of Aistear in advance of an update to the curriculum framework. *Irish Educational Studies*, *44*(3), 401–420. https://doi.org/10.1080/03323315.2024.2330893

Harvey, E., Koenecke, Al., & Kizilcec, R. F..(2025). "Don't Forget the Teachers": Towards an Educator-Centered Understanding of Harms from Large Language Models in Education. In Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25). Association for Computing Machinery, New York, NY, USA, Article 1064, 1–19. https://doi.org/10.1145/3706598.3713210

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Vogt, M., Ferraioli, V., Abou-Khalil, V., Hollenstein, L., Mondada, F., Vogt, F. (2025). Teachers' Perspectives on Using and Teaching Artificial Intelligence in Early Primary Education. In: Cristea, A.I., Walker, E., Lu, Y., Santos, O.C., Isotani, S. (eds) Artificial Intelligence in Education. Posters and Late Breaking Results, Workshops and Tutorials, Industry and Innovation Tracks, Practitioners, Doctoral Consortium, Blue Sky, and WideAIED. AIED 2025. Communications in Computer and Information Science, vol 2592. Springer, Cham. https://doi.org/10.1007/978-3-031-99267-4_22

Hollenstein, L., Vogt, M., Benz, O., & Vogt, F. (2025). High Expectations During Guided Pretend Play in Kindergarten: A Promising Way to Enhance Agency in a Digitalized Society? *Education Sciences*, *15*(4), 399. https://doi.org/10.3390/educsci15040399

Yang, W. (2025). A three-phase professional development approach to improving robotics pedagogical knowledge and computational thinking attitude of early childhood teachers, *Computers & Education, 231*, 105282, ISSN 0360-1315, https://doi.org/10.1016/j.compedu.2025.105282.

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Zhou, W., & Yang, W. (2025). Integrating story-based STEM design challenges in early childhood curricula: an activity theory perspective. *Int J Technol Des Educ* 35, 483–506. https://doi.org/10.1007/s10798-024-09917-2

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Fotakopoulou, O., O'Connor, J., & Ulatowska, J. (2025). 'Making potions and jumping on the moon': exploring young children's understanding of science and scientists using the Draw a Scientist Test (DAST). *European Early Childhood Education Research Journal*, 1–21. https://doi.org/10.1080/1350293X.2025.2578235

4. Networks established with other institutions and organisations:

The SIG's work is also connected to broader international research and development initiatives related to digitalisation, professional digital competence, generative AI, and early childhood education. These links support knowledge exchange across institutions and contribute to the development of collaborative research, publications, and conference activities. In this year's preconference, the SIG has connected with people from the Australian ARC centre of excellence ('The digital child') and with the Technical University of Crete from Greece. Both connections will present their early childhood education work at the event.

5. How do the SIG's activities fit with the aims and ethos of EECERA:

The SIG's activities align closely with the aims and ethos of EECERA by promoting high-quality, critical, and international research in early childhood education. The SIG supports cross-national collaboration, theoretical and methodological diversity, and dialogue between researchers at different career stages.

The SIG is grounded in a commitment to children's rights, participation, inclusion, and democratic early childhood education. Its focus on digital childhoods, multimodality, AI, and STEM contributes to EECERA's wider aim of advancing research that responds to contemporary societal changes and supports young children's learning, wellbeing, and agency. By creating a forum for critical discussion of digital technologies and emerging developments such as generative AI, the SIG contributes to ethical, reflective, and socially responsible research in early childhood education.