

INTRODUCTION

Youthful minds and hands: Learning practical knowledge in early modern Europe

Feike Dietz and Sven Dupré

Utrecht University

E-mails: F.M.Dietz@uu.nl, S.G.M.Dupre@uu.nl

Keywords: Early modern; practical knowledge; youth; collaborative learning practices; mediated learning



Figure 1. Ripa, Cesare. 1709. *Iconologia, or, Moral Emblems, by Cesare Ripa*. London: Benjamin Motte [Utrecht University Special Collections: ICON 166], p. 73.

In Cesare Ripa's famous and often translated anthology of personifications, *Studio* (to learn) is described as a young man (*un Giouane*) in the original Italian edition (see fig. 1, above). In this image from the eighteenth-century English edition, the learning of youths is represented as an activity characterized by solitude: reading a book on one's own. The cock on the left functions as a symbol for the diligence of such isolated young learners (Ripa 1603; Ripa 1709; Ripa 1971). Ripa's personification represents youthful learning as quite the opposite of the collective production of knowledge in the laboratory, and the technologies of learning in the workshop or on the shop floor. In the early modern period, the "studio" referred to a place for reading and drawing surrounded by books, spatially removed from the workshop or "laboratory" in which manual work was performed (Dupré 2014).

Yet, recent scholarship has shown that practical knowledge – collectively obtained in workshops or laboratories – became increasingly characteristic of the dominant knowledge cultures

in the early modern period. The boundaries between the “laboratory” and the “studio” became permissible, in the sense that books (and by extension, media) came to play a role in the production and transmission of practical knowledge. However, what sort of effects the increased value and appreciation of practical knowledge had for processes of youthful learning is a question which has not yet been answered. This topical issue therefore explores a type of early modern youthful learning that was absent in Ripa’s representation of “studio”: the acquisition of practical knowledge. Practical knowledge is “the knowledge needed to obtain a certain product – for instance, an artistic or mechanical artefact, or specific outputs, such as healing practices or mathematical results that follow a defined workflow” (Valleriani 2017, 1). As Matteo Valleriani notes in a recent book on “practical knowledge,” the workflow can be a recipe, a construction procedure, an instruction, or take another how-to form. The central question is how did young people appropriate and distribute practical knowledge, and how did learning processes change in response to knowledge cultures placing emphasis on the value of practical knowledge?

This topical issue argues that in the early modern period the merging of tutoring or apprenticing and the use of media in education, emerged as a response to this challenge. We use a multidisciplinary approach and combine different types of sources and media (Ripa’s *Iconologica*, maps, handbooks, youth literature, students’ lecture notes, etc.), to argue that innovative collaborative and mediated learning practices were developed in the early modern period to allow young people (from children to adolescents to young adults) to obtain the skills they needed to participate in cultures and societies that valued practical knowledge.

A new multidisciplinary perspective on youth and knowledge

The articles in this issue are set against the background of the major transformation of the intellectual cultures of Europe between 1500 and 1800. Recent scholarship in the history of science has shown that the rise of a new knowledge culture in early modern Europe benefited from the accumulation, structuring, and valuation of practical knowledge (including tacit and embodied knowledge). Scholarship on artisanal epistemologies in particular has called into question traditional distinctions between the hand and the mind as well as between theory and practice (Roberts, Schaffer, and Dear 2007; Smith and Schmidt 2007; Smith 2004; Smith 2009; Valleriani 2017; Long 2012; Dupré, De Munck, and Clarke 2012; Dupré and Göttler 2017). Moreover, recent scholarship has examined how and why knowledge was codified and visualized (Smith and Beentjes 2010; Smith 2010; Harkness 2007; Long 2001). Knowledge production is also considered to be a social and collective practice. In her analysis of knowledge circulation in early modern Europe, Lissa Roberts defines knowledge as something to be cognitized and embodied by books as well as human bodies, and as a community-based practice, developed in processes of joint learning (Roberts 2012a).

However, this scholarship on collective and mediated knowledge and learning practices has had little to say about the role of youth in these developing early modern knowledge cultures. This group has been largely ignored, even as interest in education and the specific stage of youth has grown from the sixteenth century onwards (Griffiths 1996), and even though sociological, psychological, and historical research has identified the accumulation of human capital in the young as a vital catalyst for social change (Klimsta a.o. 2010; Roberts 2012b; Meeus 2011; Moller 1968). Some attention has been paid to students and the way they operated in the changing contexts of universities, as well as to the enormous expansion of the early modern schooling system (Rüegg 1992–2011; Van Miert 2009; Houston 1988; Boekholt & De Booy 1987). Yet, precisely because of the increased significance of practical knowledge in the early modern period, much of the transfer and production of knowledge took place outside universities and schools (e.g. Spufford 1981).

We therefore aim to explore a wider “laboratory of learning” as found in various social and political contexts (such as guilds), in both formal and informal learning environments (institutions as well as families), scrutinizing these contexts for practices of teaching and learning practical

knowledge. While current historical research on youth mainly focuses on youngsters as knowledge consumers (Frijhoff 2012), we also look at young people's more active roles in their own education. We focus both on actual practices and on processes of conceptualization, assuming that practices of teaching and learning depended on and were rooted in debates about theory and ideals.

The originality of these articles does not lie solely in its focus on youth in an emerging knowledge culture. Equally innovative is our multidisciplinary approach: contributions come from historians of science, technology, and medicine, economic and social historians, literary scholars, intellectual historians, and historians of visual culture. The different disciplines have separated historiographical traditions as well as conceptualizations of knowledge and learning. Economic historians generally link knowledge to innovation and growth, as proved by their frequent use of the concepts "useful knowledge" and "human capital." In the past decades, educational practices have been studied within the context of guilds and crafts by economic and social historians who aimed to understand the fabric and economic organization of practical learning. Their focus has been on apprenticeship contracts, wages, and revenue models, usually without paying much attention to the content, didactics, and role of apprenticeship within broader contexts of socialization (De Munck 2007; De Munck, Kaplan, and Soly 2007; Prak and van Zanden 2013; Wallis 2008).

In literature studies, such economic aspects of knowledge are remarkably absent: knowledge is rather conceptualized as a cultural and social product, and a mediated and situated construct. Literary historians are accustomed to analyzing discourses and representations of knowledge rather than actual practices. They mainly focus on the transmission of pedagogical ideas through a range of media such as youth literature and pedagogical tracts (Lerer 2008; Bekkering 1989; Klemann 2011; Grenby 2015). Sociologists and anthropologists have done important work on craft apprenticeship and practical and embodied knowledge, which deserves to be recognized in the history of science (Marchand 2008; O'Connor 2007; Ingold 2013). In recent years, the history of science has extensively studied media practices and the function of images as modes of knowledge transmission. Historians of science have argued that the communication and transfer of knowledge was facilitated by images, including the visualization of hands-on skills (Kusukawa 2012; Dupré 2012; Dupré 2016). Yet, with the exception of Matthew Eddy's study of the use of visual media in the education of children, the imagined viewers of those images typically have been adults (Eddy 2013). More work has been done on early modern pedagogical reforms arguing in favor of reality-based teaching and the rise of "object lessons" in the seventeenth and eighteenth centuries. Kelley J. Whitmer has shown that images were acceptable to these pedagogical reformers; nevertheless, they preferred three-dimensional objects (craft and everyday objects as well as objects in collections) above images (Whitmer 2019; Whitmer 2017; Whitmer 2015).

Our multidisciplinary approach will allow us to bridge the gaps between and among these different disciplinary traditions. In this issue we explore the dynamic interplay between collaborative learning and mediated learning in early modern youth education.

The argument and the articles

The authors here contend that conceptual models of learning based on the dichotomy between schools (formal training) and practical knowledge eroded in the early modern period, when learning practices in apprenticeship ("knowing by doing") also became applied in other factual and fictional educational settings. Due to the misconstrued dichotomy between hand and mind, this has remained invisible to historians (Roberts, Schaffer, and Dear 2007). The articles offer both close studies of specific instantiations of these practices in the past and ways of conceptualizing those practices to place them in dialogue with others.

This issue shows that, faced with the challenge of practical knowledge, traditional educational contexts (such as universities) adopted aspects of the apprenticeship model. Part one is dedicated

to such expanded practices of collaborative learning. The central question here is how did young people training in fields traditionally dominated by learning by reading begin to learn hands-on and collaboratively (from peers and adults)? How did apprenticeship shape knowledgeable practitioners in the sciences and medicine?

Richard Oosterhoff clearly demonstrates that already from the early sixteenth century onwards, students and their masters joined forces to create and distribute knowledge within the context of universities and bookshops. In his contribution, Jonathan Barry analyzes how medical education gradually developed into an apprenticeship model in the eighteenth century.

As appears from Patrick Wallis's paper, the expanding practices of apprenticeship learning laid an important but not sufficient basis for the acquisition of advanced skills among the young. His close analysis of the education of British apprentices shows that individual agency and advanced studies were vital aspects of their progress: in many cases, innovation was, above all, spurred by skills and knowledge developed beyond the context of the apprenticeship.

In this way, the first part of this issue highlights the general significance of the apprenticeship model: the imitation of adults was central and dominant as an educational model in various contexts. Nevertheless, as Wallis reminds us, a balanced judgment of the educational model is required. Participation in the new knowledge cultures that emerged in the early modern period, critically depended on creative and autonomous youths who were able and willing to look beyond the borders of their workshop.

In Wallis's paper, books and media are considered to be important instruments within the alternative and autonomous course plans of ambitious pupils. In part two, several articles explore aspects of such mediated learning processes in several social and geographical contexts (e.g. Wandel's paper is about the education of a prince; Dietz discusses youth literature published for a broader audience), and in different media environments (e.g. Wandel on maps and Dietz on books). How were young people invited to use media (books, maps, images) as places of learning? How did media shape modes of becoming knowledgeable? How were travel stories and maps used to make children agents of learning?

Wandel's paper on the education of a young prince focuses on the transmission of skills and practical knowledge. Wandel argues that the prince's maps were not only used to transmit geographical knowledge, but simultaneously contributed to the prince's abilities to use media and to understand mediated representations of the world. As alternative modes of learning, maps made the young prince media-literate and skilled to explore the outside world. In a more general way, we claim that media products invited youngsters to combine knowledge from different knowledge domains (e.g. on the merging of political and geographical knowledge) and created opportunities to learn skills that – applied in a wider and different context – indeed resulted in innovation (Wallis and Oosterhoff).

However, Els Stronks and Feike Dietz question the relationship between media products and autonomous learning processes. Stronks examines the way media products (for both youths and adults) created and materialized concepts of youthful invention and curiosity, highlighting a dominant discourse on docility and guidance rather than on innovation. Dietz's paper reveals the emancipatory as well as restrictive character of travel stories for children: while travel literature facilitated active knowledge acquisition among youngsters, especially in the later eighteenth century, it left little room for autonomous agency. The youngsters' access to practical knowledge, we may conclude, was limited by the ways in which adults set up learning communities and media practices.

The six articles deal with different periods, social classes, countries, and learning contexts. We definitely do not aim to present one overarching European model of apprenticeship, or a chronological development to explain all educational practices. However, taken together, these papers highlight the emergence of new ways of teaching and learning practical knowledge in the early modern period. An important consequence of the rise of new cultures valuing practical knowledge was the invention of a new educational model connecting collaborative learning to practices of

mediated learning. Not only do the papers demonstrate the adoption of the apprenticeship model to teach youths in medicine and the sciences, they also show that we cannot understand such educational methods without taking the ambivalent role of media into consideration. Media contributed to the acquisition of skills and agency among the young, while simultaneously limiting their spaces to learn.

Acknowledgments. This topical issue comes out of a series of workshops, which have been supported by Utrecht University (Descartes Centre, Institute for Cultural Inquiry, Dynamics of Youth), the Max Planck Institute for the History of Science, KNAW (Royal Netherlands Academy of Arts and Sciences), and the University Museum Utrecht. Dupré's research has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program (grant agreement No 648718).

References

- Bekkering, Harry**, ed. 1989. *De hele Bibelebontse berg: De geschiedenis van het kinderboek in Nederland & Vlaanderen van de middeleeuwen tot heden*. [The huge 'Bibelebonts' mountain. The history of the children's book in the Netherlands and Flanders from the Middle Ages until today]. Amsterdam: Querido.
- Boekholt, Petrus Th.F.M., and Engeline P. de Booy**. 1987. *Geschiedenis van de school in Nederland vanaf de middeleeuwen tot aan de huidige tijd*. [History of schools in the Netherlands from the Middle Ages until today]. Assen/Maastricht: Van Gorcum.
- De Munck, Bert**. 2007. *Technologies of Learning: Apprenticeship in Antwerp Guilds from the 15th Century to the End of the Ancien Régime*. Turnhout: Brepols.
- De Munck, Bert, Steven L. Kaplan, and Hugo Soly**, eds. 2007. *Learning on the Shop Floor: Historical Perspectives on Apprenticeship*. New York: Berghahn.
- Dupré, Sven**. 2010. "Art History, History of Science, and Visual Experience." *Isis* 101:618–622.
- Dupré, Sven**. 2014. *Laboratories of Art: Alchemy and Art Technology from Antiquity to the 18th Century*. Archimedes, Heidelberg, New York, Dordrecht and London: Springer.
- Dupré, Sven**. 2016. "Die Sichtbarkeit und Unsichtbarkeit von Körperwissen in der Kodifikation der Künste in der frühen Neuzeit." *Paragrana – Internationale Zeitschrift für Historische Anthropologie* 25:110–129.
- Dupré, Sven, Bert De Munck, and Mark Clarke**. 2012. *Transmission of Artists' Knowledge*. Brussels: KVAB.
- Dupré, Sven, and Christine Göttler**, eds. 2017. *Knowledge and Discernment in the Early Modern Arts*. New York: Routledge.
- Eddy, Matthew Daniel**. 2013. "The Shape of Knowledge: Children and the Visual Culture of Literacy and Numeracy." *Science in Context* 26:215–245.
- Frijhoff, Willem**. 2012. "Historian's Discovery of Childhood." *Paedagogica Historica* 48(1):11–29.
- Grenby, Matthew O.** 2015. "Children's Literature, the Home, and the Debate on Public versus Private Education, c. 1760–1845." *Oxford Review of Education* 41-4:464–481.
- Griffiths, Paul**. 1996. *Youth and Authority: Formative Experiences in England, 1560–1640*. Oxford: Clarendon Press.
- Harkness, Deborah**. 2007. *The Jewel House: Elizabethan London and the Scientific Revolution*. New Haven, London: Yale University Press.
- Houston, Robert Allan**. 1988. *Literacy in Early Modern Europe: Culture and Education, 1500–1800*. London: Longman.
- Ingold, Tim**. 2013. *Making: Anthropology, Archaeology, Art and Architecture*. Hoboken: Taylor and Francis.
- Klemann, Heather**. 2011. "The Matter of Moral Education: Locke, Newbery, and the Didactic Book-Toy Hybrid." *Eighteenth-Century Studies* 44(2):223–244.
- Klimstra, Theo A., William W. Hale III, Quinten A.W. Raaijmakers, Susan J.T. Branje and Wim H.J. Meeus**. 2010. "Identity Formation in Adolescence: Change or Stability?" *Journal of Youth and Adolescence* 39:150–162.
- Kusukawa, Sachiko**. 2012. *Picturing the Book of Nature: Image, Text and Argument in Sixteenth-Century Human Anatomy and Medical Botany*. Chicago: University of Chicago Press.
- Lerer, Seth**. 2008. *Children's Literature: A Reader's History, from Aesop to Harry Potter*. Chicago and London: University of Chicago Press.
- Long, Pamela O.** 2001. *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance*. Baltimore and London: The Johns Hopkins University Press.
- Long, Pamela O.** 2012. *Artisan/Practitioners and the Rise of the New Sciences, 1400–1600*. Corvallis: Oregon State University Press.
- Marchand, Trevor H.J.** 2008. "Muscles, Morals and Mind: Craft Apprenticeship and the Formation of Person." *British Journal of Educational Studies* 56:245–271.
- Meeus, Wim**. 2011. "The Study of Adolescent Identity Formation 2000–2010: A Review of Longitudinal Research." *Journal of Research on Adolescence* 21(1):75–94.

- Miert, Dirk van.** 2009. *Humanism in an Age of Science: The Amsterdam Athenaeum in the Golden Age, 1632–1704*. Leiden: Brill.
- Moller, Herbert.** 1968. “Youth as a Force in the Modern World.” *Comparative Studies in Society and History* 10:237–260.
- O’Connor, Erin.** 2007. “Embodied Knowledge in Glassblowing: The Experience of Meaning and the Struggle towards Proficiency.” *Sociological Review* 55(1):126–141.
- Prak, Maarten, and Jan Luiten van Zanden,** eds. 2013. *Technology, Skills and the Pre-Modern Economy in the East and the West: Essays Dedicated to the Memory of S.R. Epstein*. Leiden: Brill.
- Ripa, Cesare.** 1603. *Iconologia, ouero, Descrittione di diuerse imagini cauate dall’antichità, & di propria inuentione*. Rome: Lepido Facius.
- Ripa, Cesare.** [1644] 1971. *Cesare Ripa’s Iconologia of Uytbeeldinghen des Verstants, vertaald door Dirck Pietersz. Pers* [English translation here], edited by Jochen Becker. Soest: Davaco Publishers.
- Ripa, Cesare.** 1709. *Iconologia, or, Moral Emblems, by Cesare Ripa*. London: Benjamin Motte.
- Roberts, Lissa.** 2012a. “The Circulation of Knowledge in Early Modern Europe: Embodiment, Mobility, Learning and Knowing.” *History of Technology* 31:47–68.
- Roberts, Benjamin.** 2012b. *Sex and Drugs before Rock ‘n’ Roll: Youth Culture and Masculinity in Holland’s Golden Age*. Amsterdam: Amsterdam University Press.
- Roberts, Lissa, Simon Schaffer, and Peter Dear,** eds. 2007. *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialization*. Amsterdam: Royal Netherlands Academy of Arts and Sciences.
- Rüegg, Walter,** ed. 1992–2011. *A History of the University in Europe*. Cambridge: Cambridge University Press.
- Smith, Pamela H.** 2004. *The Body of the Artisan: Art and Experience in the Scientific Revolution*. Chicago: Chicago University Press.
- Smith, Pamela H.** 2009. “Science on the Move: Recent Trends in the History of Early Modern Science.” *Renaissance Quarterly* 62(2):235–275.
- Smith, Pamela H.** 2010. “Vermilion, Mercury, Blood, and Lizards: Matter and Meaning in Metalworking.” In *Materials and Expertise in Early Modern Europe: Between Market and Laboratory*, edited by Ursula Klein and Emma Spary, 29–49. Chicago: University of Chicago Press.
- Smith, Pamela H., and Tonny Beentjes.** 2010. “Nature and Art, Making and Knowing: Reconstructing Sixteenth-Century Life-Casting Techniques.” *Renaissance Quarterly* 63:128–179.
- Smith, Pamela H., and Benjamin Schmidt.** 2007. *Making Knowledge in Early Modern Europe: Practices, Objects, and Texts, 1400–1800*. Chicago and London: University of Chicago Press.
- Spufford, Margaret.** 1981. *Small Books and Pleasant Histories: Popular Fiction and Its Readership in Seventeenth-Century England*. London: Methuen.
- Valleriani, Matteo,** ed. 2017. *The Structures of Practical Knowledge*. Dordrecht and Boston: Springer.
- Wallis, Patrick.** 2008. “Apprenticeship and Training in Premodern England.” *Journal of Economic History* 68(3):832–861.
- Whitmer, Kelley J.** 2015. *The Halle Orphanage as Scientific Community: Observation, Eclecticism and Pietism in the Early Enlightenment*. Chicago: University of Chicago Press.
- Whitmer, Kelley J.** 2017. “Imagining Uses for Things: Teaching ‘Useful Knowledge’ in the Early Eighteenth Century.” *History of Science* 55:37–60.
- Whitmer, Kelley J.** 2019. “Reimagining the ‘Nature of Children’: Realia, Reform and the Turn to Pedagogical Realism in Central Europe, c. 1600–1700.” *Journal of the History of Childhood and Youth* 12(1):113–135.

Feike Dietz is Assistant Professor of Early Modern Dutch Literature at Utrecht University. She is currently working on a research project on the relationship between early modern literature and knowledge production, specifically focusing on the way books for youths taught advanced literacy and knowledge skills. She is one of the project leaders of the NWO Vrije Competitie Project *Language Dynamics in the Dutch Golden Age*, in which literary and linguistics strategies of language variation are analyzed from an interdisciplinary perspective.

Sven Dupré is Professor of the History of Art, Science, and Technology at Utrecht University and the University of Amsterdam. He directs the ARTECHNE project, Technique in the Arts: Concepts, Practices, Expertise, 1500–1950, supported by a European Research Council (ERC) Consolidator Grant. This project has received funding from the European Research Council (ERC) under the European Union’s Horizon 2020 research and innovation programme (grant agreement No 648718). His recent publications include: *Gems in the Early Modern World: Materials, Knowledge and Global Trade, 1450–1800* (Palgrave Macmillan, 2019), *Knowledge and Discernment in the Early Modern Arts* (Routledge, 2017), and *Early Modern Color Worlds* (Brill, 2016).

Cite this article: Dietz, Feike and Dupré, Sven. 2019. “Youthful minds and hands: Learning practical knowledge in early modern Europe,” *Science in Context* 32:113–118. doi:[10.1017/S0269889719000115](https://doi.org/10.1017/S0269889719000115)