

# Curriculum Vitae Jeroen J. G. van Merriënboer

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## 1. General

Name	Jeroen Johannes Geertrudes van Merriënboer
Place of birth	Budel, The Netherlands
Date of birth	March 30, 1959
Marital status	Married, three children
Home address	Boschcour 56 6221 JR Maastricht, The Netherlands Phone +31 43 3440960, Mobile +31 6 51047666
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## 2. Education

1977	Gymnasium B	Lyceum Fons Vitae, Amsterdam
1984	drs degree in experimental psychology (Dutch equivalent to MSc)	VU University Amsterdam
	<i>Major:</i> Psychophysiology <i>Minors:</i> Human Factors (Technical University of Delft) and Multivariate Statistical Techniques (University of Utrecht) <i>Thesis:</i> The effects of fatigue on the efficiency of human information processing (supervised by prof. Dr. Co Orlebeke)	
1990	Doctor's degree, Cum Laude, in instructional technology	University of Twente, Enschede
	<i>Dissertation:</i> Teaching introductory computer programming: A perspective from instructional technology (supervised by prof. dr. Sanne Dijkstra)	

### 3. Working Experience

1977 – 1983	Several short-term appointments as teaching assistant and research assistant, VU University Amsterdam, Department of Experimental Psychology
1983 – 1984	Junior Researcher, VU University Amsterdam, Department of Experimental Psychology
1984 – 1987	Junior Researcher, University of Twente, Department of Instructional Technology
1987 – 1991	Assistant Professor, University of Twente, Department of Instructional Technology
1988 – 1995	Project supervisor and owner of Bijlstra & Van Merriënboer – Training Consultancy and Development
1991 – 1997	Associate professor of Instructional Technology, University of Twente, Department of Instructional Technology
1997 – 1998	Associate professor of Educational Psychology, Maastricht University, Department of Cognitive Psychology
1998 – 2007	Full professor of Educational Technology and Research Director, Open University of the Netherlands, Educational Technology Expertise Center (OTEC)
2007 – 2009	Full professor of Educational Technology and Scientific Director, Open University of the Netherlands, Netherlands Laboratory for Lifelong Learning (NeLLL)
2009 –	Full professor of Learning and Instruction and Research Director of the School of Health Professions Education (SHE), Maastricht University.

### 4. Awards, Honorary Chairs, Interviews

1993	Outstanding Journal Article Award For the article Van Merriënboer, J., Jelsma, O., & Paas, F. (1992). Training for reflective expertise: A four-component instructional design model for complex cognitive skills. <i>Educational Technology, Research and Development</i> , 40(2), 23-43.	Division of Instructional Design (DID) of the Association for Educational Communications and Technology
1999	Outstanding Book-of-the-Year Award For the book Van Merriënboer, J. (1997). <i>Training complex cognitive skills</i> . Englewood Cliffs, NJ: Educational Technology Publications.	Association for Educational Communications and Technology
2000	World Leader in Educational Technology	Training Magazine, November issue, featuring in the article “Quiet Revolutionist”
2002	International Contributions Award	International Council of the Association for Educational Communications and Technology
2003	Best PhD Supervisor Award	Awarded by the PhD Student division of the Netherlands Educational Research Association (NERA)
2005	Honorary Chair Ererector prof. dr. L. Verhaegen	University of Hasselt, Belgium
2009	Best PhD Supervisor Award	Awarded by the PhD Student division of the Netherlands Educational Research Association (NERA)
2011	Neon Elephant Award For many years conducting research on learning and translating that research into practical models for use by learning professionals.	Awarded by Work-Learning Research Inc., Somerville, MA, USA.

2011	Best PhD Supervisor Award	Awarded by the PhD Student division of the Netherlands Educational Research Association (NERA)
2012	AERA Fellow	Awarded by the American Educational Research Association

I am frequently interviewed by professional and scientific journals. Recent interviews include:

- Didactief (November, 2012). Herverdeel het geld voor beter onderzoek [redistribute the money for better research]. Interview with Jeroen J. G. van Merriënboer by Monique Marreveld. *Didactief*, November 2012, 9-10.
- Educational Technology Magazine (January-February, 2012). Questions and answers with EdTech leaders. Interview with Jeroen J. G. van Merriënboer by Michael Shaughnessy and Susan Fulgham. *Educational Technology Magazine*, 52(1), 49-51.
- Open Education Research (August, 2012). 10 steps to 10 questions: interview with the authors of ten steps to complex learning. Interview with Jeroen J. G. van Merriënboer and Paul A. Kirschner by Sheng Qunli, Wang Wenzhi, & Wei Zhihui (in Chinese). *Open Education Research*, 18(4), 4-11.
- Computers op School (2014). Blended learning: Effectief of niet? [Blended learning: Effective or not?] Interview with Jeroen J. G. van Merriënboer by B. Bloem, *Computers op School*, 32(1), 8-11.

## 5. Research Activities

Jeroen van Merriënboer started his research in the field of educational psychology and instructional design (ID) in the 1980s. His PhD project involved the design of introductory computer programming courses. He developed an instructional approach that became known as the ‘completion strategy’: Learners start with the study of worked-out example programs, then complete increasingly larger parts of well-written, meaningful but incomplete computer programs, and finally design and write computer programs on their own. This approach lay the foundation for the development of the four-component instructional design model (*4C/ID-model*), which builds instructional blueprints from four interrelated components: (1) learning tasks (e.g., worked-out examples, completion tasks, conventional problems etc.), (2) supportive information, (3) procedural information, and (4) part-task practice. This model was first published in a prize-winning article in 1992 (van Merriënboer, Jelsma & Paas, 1992); a complete description was given in the prize-winning book *Training Complex Cognitive Skills* (van Merriënboer, 1997; also translated in Korean and Chinese), and a description of the model that provides the basis for a computer-based instructional design system was published in 2002 (Van Merriënboer, Clark, & de Croock; 2002). The latest version of the model is described in the book *Ten Steps to Complex Learning*, co-authored by prof. dr. Paul Kirschner (van Merriënboer & Kirschner, 2007, second revised edition in 2013; also translated in Chinese, Korean and partly in Spanish). Nowadays, the 4C/ID-model is taught in educational ID programs around the world and broadly applied in educational practice (both in business and industry and schools for vocational and professional training).

Since the beginning of the 1990s, van Merriënboer’s research on the design of learning tasks (the first component of the 4C/ID-model) has been conducted in collaboration with John Sweller and his group at the University of New South Wales. Together with him a new version of Cognitive Load Theory (CLT) has been developed that includes the concept of ‘germane’ cognitive load, that is, load devoted to processes that are directly relevant for learning (Sweller, van Merriënboer, & Paas, 1998; van Merriënboer & Sweller, 2005, 2010). An article in *Educational Psychologist* describes a further integration of the 4C/ID-model with CLT (van Merriënboer, Kirschner, & Kester, 2003). While this

research is not limiting itself to computer-based environments, one particularly important theme is how computers can improve design processes (e.g., van Merriënboer & Martens, 2002; van Merriënboer & Ayres, 2005) as well as learning processes in e-learning environments (e.g., van Merriënboer & Brand-Gruwel, 2005; van Merriënboer & Kester, 2005; van Merriënboer & Boot, 2005). Since 2009, van Merriënboer's research is mainly situated in the health sciences domain.

PhD project supervision	<ol style="list-style-type: none"> <li>1. Instructional control of cognitive load in the training of complex cognitive tasks (Fred Paas, March 5, 1993). University of Twente.</li> <li>2. Composing SQL queries: A study on problem-solving strategies in computer science education (Betsy van Dijk, August 23, 1996). University of Twente.</li> <li>3. The transfer paradox: Training design for troubleshooting skills (Marcel de Croock, June 18, 1999). University of Twente.</li> <li>4. On the proper treatment of learning and transfer: A study on introductory computer programming (Jan-Gerrit Schuurman, October 6, 1999). University of Twente.</li> <li>5. Efficient complex skill training into old age: Exploring the benefits of cognitive load theory (Pascal van Gerven, June 21, 2002). Open University of the Netherlands.</li> <li>6. Student involvement in assessment: The training of peer assessment skills (Dominique Sluijsmans, June 28, 2002). Open University of the Netherlands. <i>This dissertation received the 2003 dissertation award of the Netherlands Educational Research Association (NERA).</i></li> <li>7. The modality of text in multimedia instructions: Refining the design guidelines (Huib Tabbers, September 13, 2002). Open University of the Netherlands.</li> <li>8. Timing of information presentation and the acquisition of complex skills (Liesbeth Kester, September 5, 2003). Open University of the Netherlands.</li> <li>9. Process support for learning tasks in multimedia practicals (Rob Nadolski, March 5, 2004). Open University of the Netherlands.</li> <li>10. Towards flexible program in higher education (Ad Schellekens, May 14, 2004). Open University of the Netherlands.</li> <li>11. Tools for the identification and description of competencies (Angela Stoof, March 4, 2005). Open University of the Netherlands.</li> <li>12. Dynamic task selection in aviation training (Ron Salden, April 22, 2005). Open University of the Netherlands.</li> <li>13. Building-block solutions for developing instructional software (Eddy Boot, December 9, 2005). Open University of the Netherlands.</li> <li>14. Uncovering the problem-solving process to design effective worked examples (Tamara van Gog, April 28, 2006). Open University of the Netherlands.</li> <li>15. Student perspectives on education: Implications for instructional re-design (Karen Könings, June 15, 2007). Open University of the Netherlands. <i>This dissertation received the 2008 dissertation award of the Netherlands Educational Research Association (NERA).</i></li> <li>16. How to optimize cognitive load for learning from animated models (Pieter Wouters, December 7, 2007). Open University of the Netherlands.</li> <li>17. Shared control over task selection – Helping students to select their own learning tasks (Gemma Corbalan Perez, April 25, 2008). Open University of the Netherlands.</li> <li>18. Training complex judgment: The effects of critical thinking and contextual</li> </ol>
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	<p>interference (Anne Helsdingen, November 7, 2008). Open University of the Netherlands.</p> <p>19. Development portfolios in vocational education: Helping students to direct their own learning (Wendy Kicken, December 12, 2008). Open University of the Netherlands.</p> <p>20. Individualized strategies for prior knowledge activation (Sandra Wetzels, December 18, 2009). Open University of the Netherlands.</p> <p>21. Improving sustainable assessment skills in vocational education (Greet Fastre, March 11, 2011). Open University of the Netherlands.</p> <p>22. Conditions of peer assessment for complex learning (Marjo van Zundert, May 4, 2012). Maastricht University.</p> <p>23. Segmentation of animations: Explaining the effects on the learning process and learning outcomes (Ingrid Spanjers, July 5, 2012). Maastricht University.</p> <p>24. Advisory models for on-demand learning (Elisabeth Taminau, May 24, 2013). Open University of the Netherlands.</p> <p>25. Visual problem solving and self-regulation in training air traffic control (Ludo W. van Meeuwen, September 6, 2013). Open University of the Netherlands.</p> <p>26. Is that your final answer? How doctors should check decisions (Matthew Sibbald, October 9, 2013). Maastricht University.</p> <p>27. Fostering monitoring and regulation of learning (Mariëtte van Loon, May 8, 2014). Maastricht University.</p>
Editorial work	<p>Editorial board member of:</p> <ul style="list-style-type: none"> <li>- American Educational Research Journal</li> <li>- Cognitive Processing</li> <li>- Computers in Human Behavior</li> <li>- Educational Research Review (EDUREV)</li> <li>- Educational Technology Magazine</li> <li>- Educational Technology, Research and Development</li> <li>- Gazi Journal of Education</li> <li>- International Journal for Virtual and Personal Learning Environments</li> <li>- Journal of Computing in Higher Education</li> <li>- Learning and Instruction (<i>Associate Editor: 2009-2013</i>).</li> <li>- Technology, Instruction, Cognition and Learning</li> </ul>
Funding (2005-)	<p>NWO</p> <ul style="list-style-type: none"> <li>- Scaffolding self-regulation: Effects on the acquisition of domain-specific skills and self-regulated learning skills (2012, NRO, 750 kEuro)</li> <li>- Improving learning through adaptive design of instructional animations (2007, Open Competition, 250 kEuro)</li> <li>- Optimizing the effectiveness and reliability of reciprocal peer assessment in secondary education (2005, PROO, 250 kEuro)</li> </ul> <p>Other funding organizations</p> <ul style="list-style-type: none"> <li>- Multiplex (2010, Sirius-2 grant from Platform betatechniek, two million)</li> <li>- Kennisnet (2011, 280 kEuro)</li> </ul> <p>Industry</p> <ul style="list-style-type: none"> <li>- Knowledge Development Center (KDC) Mainport Schiphol (2007, 1 million).</li> </ul>

Long-term Visiting Professorships	<ul style="list-style-type: none"> <li>– 1995: University of Barcelona, Department of Educational Psychology, prof. dr. Begona Gros-Salvat (Spain)</li> <li>– 2003-2004: University of New South Wales, School of Education, prof. dr. John Sweller (Australia).</li> </ul>
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## 6. Management Responsibilities

### *Maastricht University (2009-)*

- Research Director, School of Health Professions Education (SHE)

### *Netherlands Initiative for Education Research (NRO, part of NWO)*

- Vice-chair of the NRO steering group (2013-)

### *Interuniversity Center for Educational Research (ICO)*

ICO is an interuniversity centre of 13 universities in the Netherlands and Belgium/Flanders. The centre organizes a joint PhD program for over 120 PhD students.

- Scientific Director (2007-2012)
- Educational Director (2005-2007)
- Member of the Management Team (1998-2012)
- Chair of the ICO division Innovative Learning Arrangements (2005-2007)
- Chair of the ICO division Instructional Design (1998-2005)

### *Open University of the Netherlands (1998-2009 )*

- Scientific Director of the Netherlands Laboratory for Lifelong Learning (2007-2009)
- Vice Dean (2003-2006) and Interim Dean (2006-2007) of the Educational Technology Expertise Center (OTEC)
- Research director of the Educational Technology Expertise Center (1998-2007)

### *Maastricht University (1997-1998)*

- Chair of the Department of Cognitive Psychology
- Member of the Educational Board of the Faculty of Psychology

### *University of Twente (1984-1997)*

- Faculty board member, responsible for the educational programs and public relations of the faculty (1991-1994)
- Vice-chair of the Teacher Training Program (1994-1997)
- Member of the board of the Department of Instructional Technology (secretary, 1995-1997)
- Member of the Educational Advisory Board of the University of Twente (1991-1994)

### *Other*

- Member of the Scientific Advisory Board of the Knowledge Media Research Centre (KMRC), Tuebingen, Germany (2012-).
- Interim Chair of the NWO Program Council for Educational Research (PROO) (2011-2013)
- Chair of the Dutch National Evaluation Committee for Educational Bachelor and Master programs in the Educational Sciences (Quality Assurance Netherlands Universities) (2012).
- Member International Advisory Board Florida Center for Research in Science, Technology, Engineering and Mathematics (FCR-STEM) (2006-2009)
- Member of the scientific educational network of the National Science Foundation in Flanders

- (2002-)
- Member management team of the Netherlands Educational Research Association (NERA) (1998-2007)
  - Chair NERA division Information and Communication Technology (2001-2007)
  - Board member of the NERA-division Vocational and Business Training (1997-2005)
  - Member of the Consortium for Teens and Technology (1999-2004)
  - Member of the Research and Technology Group of the European Association for Distance Teaching Universities (EADTU, 1998-2002)
  - Steering Committee Member of the European Prometheus network (1999-2001)
  - Coordinator of the Special Interest Group Instructional Design of the European Association for Research on Learning and Instruction (EARLI, 1994-1998)

## 7. Educational Activities

<p>1987-1997 University of Twente</p>	<ul style="list-style-type: none"> <li>- Master's program in Educational Science and Technology</li> <li>- Teacher Education Program</li> <li>- International Master's program Educational and Training Systems Design</li> <li>- Master's program Communication Sciences</li> </ul> <p><i>1994: nominated for the University of Twente Teaching Award by the students of the Department of Education as the "most inspiring teacher".</i></p>	<ul style="list-style-type: none"> <li>- Responsible for courses in educational measurement, general and cognitive psychology, artificial intelligence, instructional technology, problem solving, motivation, instructional design, research methods, and others.</li> <li>- Member of curriculum development committee for Communication Sciences.</li> <li>- Teaching post-graduate courses for teachers (in cooperation with the University of Groningen) and designers in industry.</li> <li>- Supervision of about 50 master's theses.</li> <li>- Thesis advisor, which includes the acquisition of external thesis projects in business and industry.</li> </ul>
<p>1997-1998 University of Maastricht</p>	<ul style="list-style-type: none"> <li>- Master's program in Educational psychology</li> <li>- Master's program in Cognitive Ergonomics</li> </ul>	<ul style="list-style-type: none"> <li>- Responsible for setting up a new program in Educational Psychology, according to the Maastricht system of problem-based learning (PBL).</li> <li>- Teaching the courses Skills and Technology, Assessment in Education, Systems Thinking, Motivational design of instruction, and Simulations in training and human performance</li> </ul>
<p>Interuniversity Center for Educational Research (ICO)</p>	<ul style="list-style-type: none"> <li>- PhD program in educational research</li> </ul>	<ul style="list-style-type: none"> <li>- Summer course on state-of-the-art in educational technology and design (with Peter Goodyear from Lancaster University)</li> </ul>

1992 -		<ul style="list-style-type: none"> <li>- Several thematic courses on cognitive load theory and educational design</li> <li>- ICO Introduction course (2004-)</li> </ul>
Open University of the Netherlands	<ul style="list-style-type: none"> <li>- Master's program Active Learning</li> <li>- Master Health Professional Education (MHPE)</li> </ul>	<ul style="list-style-type: none"> <li>- Involved in research courses of Active Learning; involvement in courses taught by the University of Maastricht in cooperation with the Open University of the Netherlands</li> </ul>
Maastricht University	<ul style="list-style-type: none"> <li>- Master Health Professional Education (MHPE)</li> <li>- Advanced courses</li> </ul>	<ul style="list-style-type: none"> <li>- Unit 8: Learning Environments</li> <li>- Curriculum and Course Design, Writing a PhD proposal</li> <li>- Thesis advisor for MHPE students</li> <li>- Lecturing for University Honours programs and the Teaching Academy</li> </ul>

## 8. Memberships

- Netherlands Society for Medical Education (NVMO)
- Association for Medical Education in Europe (AMEE)
- Netherlands Educational Research Association (VOR)
- European Association for Research on Learning and Instruction (EARLI)
- American Educational Research Association (AERA, fellow)
- Association for Educational Communications and Technology (AECT)

## 9. Software Prototypes

Many small prototypes have been developed for conducting experiments. Therefore, the list below only contains prototypes that have been used for a broad range of studies and that are documented in separate articles:

MacMFFT	An implementation of the Matching Familiar Figures Test (an instrument for measuring the cognitive style reflection-impulsivity) on the Apple Macintosh. Includes user manual and full documentation.
CASCO	Completion Assignment Constructor – an Intelligent Tutoring System for teaching computer programming, applying the completion strategy and using dynamic models for task selection and task construction.
Process-PC	A dynamical simulation of a water-alcohol distillery for training and research purposes. Includes full documentation and user manual. It is used in schools for middle vocational training, within educational programs in process technology.
Distiller	A system for building dynamical simulations of chemical processes, used for research and training on troubleshooting and fault management. Currently further developed at Florida State University.



ADAPT <sup>IT</sup>	Advanced Design Approach for Personalized Training – Interactive Tools. A computer-based design system for professional designers who develop training blueprints according to the 4C/ID-model. It is used for training design in professional organizations and institutes for professional education. A commercial version is available from <a href="http://www.enovateas.com">www.enovateas.com</a> .
Care Village	An integrated system for the selection and assessment of learning tasks for students in senior vocational education. Has been implemented for students in nursing and care.
STEPP	Structured Task Evaluation and Planning Portfolio. A digital development portfolio for students in senior vocational education, with support for self-assessment and selection of future learning tasks. Has been implemented for hairstylist students.

## 10. Publications

### *Inaugural Addresses*

- Van Merriënboer, J. J. G. (2010, June). *Innovatief onderwijs ontwerpen in het gezondheidsdomein* [Educational innovation in the health sciences domain]. Inaugural address, June 4, Maastricht University, The Netherlands.
- Van Merriënboer, J.J.G. (2005, June). *Het ontwerpen van leertaken binnen de wetenschappen: 'Four-components instructional design' als generatief ontwerpmodel*. Inaugural address on the occasion of accepting the Honorary Chair Erector prof. dr. L. Verhaegen at the University of Hasselt, June 8, Hasselt, Belgium.
- Van Merriënboer, J.J.G. (1999, June). *Cognition and multimedia design for complex learning*. Inaugural address on the occasion of accepting the Chair of Educational Technology Research at the Open University of the Netherlands, June 5, Heerlen, The Netherlands.

### *Authored Books*

- Van Merriënboer, J. J. G., & Kirschner, P. A. (2013). *Ten steps to complex learning* (Second Revised Edition). New York: Routledge.
- Van Merriënboer, J. J. G., & Kirschner, P. A. (2012). *Ten steps to complex learning* (Chinese translation). Fuzhou, China: Fujian Education Press.
- Van Merriënboer, J. J. G., & Kirschner, P. A. (2010). *Ten steps to complex learning* (Korean translation). Korea: Academy Press.
- De Jong, T., van Gog, T., Jenks, K., Manlove, S., van Hell, J., Jolles, J., van Merriënboer, J. J. G., van Leeuwen, Th., & Boschloo, A. (2009). *Explorations in learning and the Brain: On the potential of cognitive neuroscience for Educational Science*. New York: Springer.
- Van Merriënboer, J. J. G., & Kirschner, P. A. (2007). *Ten steps to complex learning*. Mahwah, NJ: Erlbaum.
- Van Merriënboer, J. J. G. (2005). *Training complex cognitive skills: A four-component instructional design model for technical training* (Korean translation). Korea: Academy Press.
- Janssen-Noordman, A. M. B., & van Merriënboer, J. J. G. (2002). *Innovatief onderwijs ontwerpen: Via leertaken naar complexe vaardigheden* [Innovative instructional design: From learning tasks to complex skills]. Groningen, The Netherlands: Wolters Noordhoff.
- Van Merriënboer, J. J. G. (1997). *Training complex cognitive skills: A four-component instructional design model for technical training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Van Merriënboer, J. J. G. (1990). *Teaching introductory computer programming - A perspective from instructional technology*. Enschede, The Netherlands: Bijlstra & Van Merriënboer.

### **Edited Books**

- Spector, J. M., Merrill, M. D., van Merriënboer, J. J. G., & Driscoll, M. P. (2012) (Eds.), *Handbook of research on educational communications and technology* (Third Ed.; Chinese translation). Shanghai, China: East China Normal University Press.
- Van Merriënboer, J. J. G., Correia, S., & Paiva, J. (Eds.). (2012). *As novas tecnologias* (in Portuguese). Lisboa, Portugal: Fundacao Francisco Manuel Dos Santos.
- Hoogveld, B., Janssen-Noordman, A., & van Merriënboer, J. J. G. (2011) (Eds.). *Innovatief onderwijs ontwerpen in de praktijk* [Designing innovative education in practice]. Groningen: Noordhoff.
- Spector, J. M., Merrill, M. D., van Merriënboer, J. J. G., & Driscoll, M. P. (2008) (Eds.), *Handbook of research on educational communications and technology* (Third Ed.). Mahwah, NJ: Erlbaum/Routledge.
- Jochems, W., van Merriënboer, J. J. G., & Koper, R. (Eds.) (2004). *Integrated E-Learning*. London, UK: RoutledgeFalmer.
- Jochems, W., van Merriënboer, J. J. G., Koper, R., & Bastiaens, Th. J. (Eds.). (2004). *Een geïntegreerde benadering van e-learning* [An integrated approach to e-learning]. Groningen, The Netherlands: Wolters Noordhoff.
- De Corte, E., Verschaffel, L., Entwistle, N., & van Merriënboer, J. J. G. (Eds.). (2003). *Unravelling basic components and dimensions of powerful learning environments*. Oxford: Elsevier Science.
- Lazonder, A., & van Merriënboer, J. J. G. (Eds.). (2003). *Probleemoplossen en instructie – Liber Amicorum voor prof. dr. Sanne Dijkstra* [problem solving and instruction – Liber Amicorum for prof. dr. Sanne Dijkstra]. Enschede, The Netherlands: Twente University Press.
- Van Merriënboer, J. J. G., Moerkerke, G., & Gros, B. (Eds.) (1998). *Instructional design for problem-based learning - Proceedings of the third workshop of the EARLI SIG Instructional Design*. Maastricht, The Netherlands: Maastricht University Press.
- Dijkstra, S., Krammer, H. P. M., & Van Merriënboer, J. J. G. (Eds.). (1992). *Instructional models in computer-based learning environments*. Heidelberg, Germany: Springer Verlag.

### **Journal Articles**

- Al-Eraky, M. M., Donkers, J., Wajid, G., & van Merriënboer, J. J. G. (2014). A Delphi study of medical professionalism in Arabian countries: The Four-Gates model. *Medical Teacher*, 36(S1), S8-S16.
- Carbonell, K. B., Stalmeijer, R. E., Konings, K. D., Segers, M., & van Merriënboer, J. J. G. (2014). How experts deal with novel situations: A review of adaptive expertise. *Educational Research Review*, 12, 14-29.
- Choi, H. H., van Merriënboer, J. J. G., & Paas, F. (2014). Effects of the physical environment on cognitive load and learning: Towards a new model of cognitive load. *Educational Psychology Review*, 26(2), 225-244.
- Dankbaar, M. E. W., Stegers-Jager, K. M., Baarveld, F., van Merriënboer, J. J. G., Norman, G. R., Rutten, F. L., van Saase, J. L. M. C., & Schuit, S. C. E. (2014). Assessing the assessment in emergency care training. *PLoS ONE*, 9(12), e114663.
- De Vries, A. H., Hendriks, A. J. M., Koldewijn, E. L., Schout, B. M. A., Wagner, C., & van Merriënboer, J. J. G. (2014). De Test Objective Performance (TOP) TURT: Een objectieve toets voor het meten van technische en niet-technische bekwaamheid in TURT. *Tijdschrift voor Urologie*, 4(7), 163-164.
- Fastre, G. M. J., van der Klink, M. R., Amsing-Smit, P., & van Merriënboer, J. J. G. (2014). Assessment criteria for competency-based education: A study in nursing education. *Instructional Science*, 42(6), 971-994.
- Jaarsma, Th. J., Jarodzka, H., Nap, M., van Merriënboer, J. J. G., & Boshuizen, H. P. A. (2014). Expertise under the microscope: Processing histopathological slides. *Medical Education*, 48,

292-300.

- Konings, K. D., Seidel, T., Brand-Gruwel, S., & van Merriënboer, J. J. G. (2014). Differences between students' and teachers' perceptions of education: Profiles to describe congruence and friction. *Instructional Science*, 42, 11-30.
- Konings, K. D., Seidel, T., & van Merriënboer, J. J. G. (2014). Participatory design of learning environments: Integrating perspectives of students, teachers, and designers. *Instructional Science*, 42(1), 1-9.
- Leppink, J., Paas, F., van Gog, T., van der Vleuten, C. P. M., & van Merriënboer, J. J. G. (2014). Effects of pairs of problems and examples on task performance and different types of cognitive load. *Learning and Instruction*, 30, 32-42.
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#### ***Other Publications and Presentations (2009-)***

- Melo, B., da Silva, F. M., van der Vleuten, C., & van Merriënboer, J. J. G. (2014). The effectiveness of instructional-design based simulation scenarios for postpartum hemorrhage. *Simulation in Healthcare*, 9(6), 421.
- Spanjers, I., Konings, K. D., Leppink, J., & van Merriënboer, J. J. G. (2014). *Blended leren: Hype of verrijking van het onderwijs?* Rapport voor Kennisnet. Maastricht: School of Health Professions Education.
- Van Merriënboer, J. J. G. (2014). *Opleiden voor transfer. Presentatie voor het onderwijscentrum van de VU Amsterdam*, 11 december, Amsterdam, Nederland.
- Van Merriënboer, J. J. G. (2014). *ICT and education: Multimedia learning based on authentic tasks*. Invited presentation at the EUR Symposium on behalf of the farewell of Geoff Norman, November 27, Rotterdam, The Netherlands
- Van Merriënboer, J. J. G. (2014). *De psychologische basis voor het ontwerpen van onderwijs*. Presentatie bij het Nationaal Psychologie Congres voor Studenten, 14 November, Utrecht, Nederland.
- Van Merriënboer, J. J. G. (2014). *On myths and theories: International perspectives on a solid research program for learning, design and technology*. Presidential session at the AECT, November 6, Jacksonville, USA.
- Van Merriënboer, J. J. G. (2014). *Designing simulations and games for learning*. Keynote for the DIVO Conference, October 16, Moscow, Russia.
- Van Merriënboer, J. J. G. (2014). *Leren in de toekomst: Zijn we er klaar voor?* Presentatie voor Kenteq, 18 september, Soest, Nederland.
- Van Merriënboer, J. J. G. (2014). *New perspectives on curriculum and course design: The end of PBL?* Symposium at the AMEE Conference, September 1, Milan, Italy.
- Van Merriënboer, J. J. G. (2014). *Educational simulations and games: CLT as the linking pin between psychological and design theories*. Invited keynote at the Cognitive Load Theory Conference, June 24, Taipei, Taiwan.
- Van Merriënboer, J. J. G. (2014). *Research on learning and instruction of complex skills*. Invited presentation for Erasmus Medical Center, May 26, Rotterdam, The Netherlands.
- Van Merriënboer, J. J. G. (2014). *Health education and technology*. Invited presentation for the AAATE Workshop Education in Care and Assistive Technology, May 23, Heerlen, The Netherlands.
- Van Merriënboer, J. J. G., & Roex, A. (2014). *Instructional design enhancing transfer of learning*. Workshop at the Ottawa Conference, April 28, Ottawa, Canada.
- Van Merriënboer, J. J. G. (2014). *Instructional design research on complex learning: Past, present and future*. Keynote presentation for the AERA SIG Technology, Instruction, Cognition and

- Learning, April 4, Philadelphia, USA.
- Van Merriënboer, J. J. G. (2014). *Measuring different types of cognitive load*. Presentation for Kaplan University, April 3, Philadelphia, USA.
- Van Merriënboer, J. J. G. (2014). *Van beroep naar opleiden: Leren en instructie*. Presentatie voor het Deltion College, 1 April, Zwolle.
- Van Merriënboer, J. J. G. (2013, January 29). *How PBL disrupts your university - And what to do about it?* Presentation for the Higher School of Economics (HSE), Moscow, Russia.
- Van Merriënboer, J. J. G. (2013, March 14). *A Design perspective on VET: How development portfolios support teachers and learners*. Invited keynote for 3rd Congress on Research in VET, Bern, Switzerland.
- Van Merriënboer, J. J. G. (2013, March 27). *Succesvol schrijven van een NWO-voorstel* [Writing a successful research proposal for the national science foundation]. Workshop for the NVMO, Utrecht, the Netherlands.
- Van Merriënboer, J. J. G. (2013, April 12). *4C/ID: Van eenvoudige simulaties naar serious games* [4C/ID: From simple simulations to serious games]. Keynote for 4C/ID Users' Day, Utrecht, The Netherlands.
- Van Merriënboer, J. J. G., & Jacobs, A. (2013, April 19). *Professioneel beoordelen betekent: het ontwerp van betekenisvolle beoordelingstaken*. Workshop for Zuyd University of Applied Sciences, Heerlen, The Netherlands.
- Van Merriënboer, J. J. G. (2013, May 1). Perspectives on problem solving and instruction. Presentation at the AERA Symposium Applications of CLT to Online Instruction, San Francisco, USA.
- Van Merriënboer, J. J. G. (2013, May 29). *Inleiding in de cognitieve belastingstheorie* [Introduction to cognitive load theory]. Presentation at the ORD Symposium Cognitive Load Theory and Mathematics Instruction, Brussels, Belgium.
- Van Merriënboer, J. J. G. (2013, June 9-10). *4C/ID and instructional design for continuous medical education*. Invited workshop for the Global Alliance for Medical Education (GAME) conference, Barcelona, Spain.
- Van Merriënboer, J. J. G., Mirghani, H., & de Bruin, A. B. H. (2013, June 27). *Cognitive load and sequencing instruction*. Presentation at the 6th International Cognitive Load Theory Conference, Toulouse, France.
- Van Merriënboer, J. J. G. (2013, July 2). *Instructional design with 4C/ID*. Workshop for Royal Netherlands Defence - Sharing the Power of Knowledge (SPOK), Amsterdam, The Netherlands.
- Van Merriënboer, J. J. G. (2013, July 27). *A design perspective on workplace learning: Development portfolios and the planning of learning trajectories*. Presentation at the EARLI Conference, Munich, Germany.
- Van Merriënboer, J. J. G. (2013, September 26). *Designing integrated curricula*. Presentation at the Innovations in Higher Education Day (IHED), Moscow, Russia.
- Van Merriënboer, J. J. G. (2013, September 27). *Four-component instructional design*. Presentation for Fontys University of Applied Sciences, Eindhoven, The Netherlands.
- Van Merriënboer, J. J. G. (2013, October 16-18). *Introduction to Instructional Design and Technology*. Workshop for the Higher School of Economics (HSE), Moscow, Russia.
- Van Merriënboer, J. J. G. (2013, October 31). *Leertheorieën, onderwijsconcepten en innovatietheorieën* [Learning theories, educational concepts, and innovation theories]. Workshop for Academic Leadership Program in VET, Utrecht, The Netherlands.
- Van Merriënboer, J. J. G. (2013, November 11). *The value of educational research for scientists and the Role of ICO*. Keynote for the Interuniversity Centre for Educational Research (ICO), Maastricht, The Netherlands.
- Van Merriënboer, J. J. G. (2013, November 20). *Onderwijs maken met vier componenten* [constructing educational programmes with four components]. Presentation for RijnIJssel College, Arnhem, The Netherlands.
- Van Merriënboer, J. J. G. (2013, December 4). *4C/ID – Four Component Instructional Design*.

- Presentation for Psychology Department at Erasmus University, Rotterdam, The Netherlands.
- Van Merriënboer, J. J. G. (2012, January 10). *E-learning in PBL*. Presentation for Maastric Clinic. Maastricht, The Netherlands.
- Van Merriënboer, J. J. G. (2012, February 15). *An overview of 4C/ID*. Presentation for Facility Management, Hogeschool Zuyd. Heerlen, The Netherlands.
- Van Merriënboer, J. J. G. (2012, April 9-12). *Applications of cognitive load theory in medical education*. Presentation at the Fifth International CLT Conference. Florida State University, Tallahassee, USA.
- Van Merriënboer, J. J. G. (2012, April 13-17). *A design view on new technologies and learning*. Invited presentation at the WERA symposium Global Perspectives on New Technologies and Learning, AERA Annual Meeting. Vancouver, Canada.
- Van Merriënboer, J. J. G. (2012, April 17). *4C/ID gaat omhoog: Steigers van de tweede orde*. Keynote at the annual 4C/ID user meeting. Utrecht, The Netherlands.
- Van Merriënboer, J. J. G. (2012, August 23). *How people learn*. Presentation for the EACPT Summer School. VU Medical Center. Amsterdam, The Netherlands.
- Van Merriënboer, J. J. G. (2012, August 25-29). *Applications of cognitive load theory in medical education*. Presentation at the annual conference of the Association of Medical Education in Europe (AMEE). Lyon, France.
- Van Merriënboer, J. J. G. (2012, September 28). *Effectief innoveren met 4C/ID*. Presentation for InHolland. Hoofddorp, The Netherlands.
- Van Merriënboer, J. J. G., & Dolmans, D. (2012, November 5-9). *Research on whole-task models in education*. Workshop for the ICO fall school. Girona, Spain.
- Van Merriënboer, J. J. G. (2012, November 5-9). *Research on learning and instruction: From cognitive architecture to self-directed learning*. Invited keynote, ICO fall school. Girona, Spain.
- Van Merriënboer, J. J. G. (2012, November 26). *4C/ID – Four Component Instructional Design*. Presentation for Erasmus University Rotterdam, Institute of Psychology. Rotterdam, The Netherlands.
- Van Merriënboer, J. J. G. (2012, December 3-5). *New technologies in education based on 4C/ID*. Series of Keynotes for the Francisco Manuel dos Santos Foundation. Porto / Leiria / Lisbon, Portugal.
- Van Merriënboer, J. J. G. (2012, December 6). *Systematisch ontwerpen van blended learning*. Presentation for KU Leuven KULAK. Kortrijk, Belgium.
- Van Merriënboer, J. J. G. (2011). *Can we replace a medical educator by a computer?* Presentation at the annual conference of the American Educational Research Association (AERA), April 9, New Orleans, USA.
- Van Merriënboer, J. J. G. (2011). *4C/ID versie 2*. Presentation at the annual 4C/ID users meeting, April 14, Utrecht, The Netherlands.
- Van Merriënboer, J. J. G. (2011). *Leren en Innoveren*. Presentation for InHolland, April 15, Hoofddorp, The Netherlands.
- Van Merriënboer, J. J. G. (2011). *Innovations in PBL: Theoretical background*. Presentation for the OnderwijsResearchDagen (ORD 2011), June 9, Maastricht, The Netherlands.
- Van Merriënboer, J. J. G. (2011). *Hoe kunnen onderzoekersopleidingen in het toekomst het beste georganiseerd worden?* Symposium for the OnderwijsResearchDagen (ORD 2011), June 10, Maastricht, The Netherlands.
- Van Merriënboer, J. J. G. (2011). *Ontwikkelen met het 4C/ID model*. Presentation for the military SPOK-days, June 22, Amsterdam, The Netherlands.
- Van Merriënboer, J. J. G. (2011). *Research on visual diagnostic expertise at Maastricht University*. Presentation for the symposium Visual Diagnostic Expertise, June 27-29, Turku, Finland.
- Van Merriënboer, J. J. G. (2011). *Expertise development in the classroom: Utopia or Reality?* Presentation at the biannual conference of the European Association for Research on Learning and Instruction (EARLI), September 1, Exeter, UK.
- Van Merriënboer, J. J. G. (2011). *Education for a global networked society: Online collaborative*

- learning in higher education*. Presentation at the biannual conference of the European Association for Research on Learning and Instruction (EARLI), September 3, Exeter, UK.
- Van Merriënboer, J. J. G. (2011). *Learning critical competencies: A 4C/ID perspective*. Presentation for Air Traffic Control the Netherlands (LVNL), September 21, Amsterdam, The Netherlands.
- Van Merriënboer, J. J. G. (2011). *4C/ID in military training*. Presentation for Royal Dutch Defense, September 22, 't Harde, The Netherlands.
- Van Merriënboer, J. J. G. (2011). *Learning innovation in healthcare*. Online presentation for Kaplan University, September 28, Maastricht, The Netherlands.
- Van Merriënboer, J. J. G. (2011). *Het 4C/ID ontwerpmodel: Toepassingen in het HBO*. Presentation for Hogeschool Zuyd, September 29, Maastricht, The Netherlands.
- Van Merriënboer, J. J. G. (2011). *4C/ID als onderzoekskader*. Presentation for ALTUS, November 22, Leuven, Belgium.
- Van Merriënboer, J. J. G. (2010, January). *Virtual patients in the learning environment*. Invited keynote for the EVIP symposium Virtual Patients and Simulations in Medical Education, January 14, Maastricht, The Netherlands.
- Van Merriënboer, J. J. G. (2010, January). *4C/ID: Een innovatieve benadering bij het (her)ontwerp van leerpraktijken*. Presentation for InHolland University for Applied Sciences, January 15, Hoofddorp, The Netherlands.
- Van Merriënboer, J. J. G. (2010, February). *What is transfer of learning and how can we make it work?* Invited keynote for the INMED Conference, February 18-19, Galway, Ireland.
- Van Merriënboer, J. J. G. (2010, February). *Competentiegericht onderwijs in de techniek*. Presentation for Arcus College, February 23, Heerlen, The Netherlands.
- Van Merriënboer, J. J. G. (2010, March). *Onderwijskundige principes van training*. Invited keynote for the symposium Update of Practical Skills Training, March 4, VU University Amsterdam, The Netherlands.
- Van Merriënboer, J. J. G. (2010, March). *Valkuilen bij het ontwerpen van competentiegericht onderwijs*. Invited keynote for the Annual 4C/ID Conference, March 5, Utrecht, The Netherlands.
- Van Merriënboer, J. J. G. (2010, March). *Onderwijsontwikkeling en heroriëntatie op onderwijsrollen*. Workshop for TIAS-NIMBAS, March 1, Tilburg, The Netherlands.
- Van Merriënboer, J. J. G. (2010, March). *A design perspective on adaptive training systems*. Workshop for the bi-annual ICO School, March 21-25, Regensburg, Germany.
- Van Merriënboer, J. J. G. (2010, April). *Zin en onzin van theorieën voor medisch-onderwijskundig onderzoek*. Invited keynote for the Annual NVMO PhD Day, April 23, Utrecht, The Netherlands.
- Van Merriënboer, J. J. G. (2010, May). *An instructional design perspective on conceptual change*. Invited keynote for the 7th Bi-annual Meeting of the EARLI SIG Conceptual Change, May 24-27, Leuven, Belgium.
- Van Merriënboer, J. J. G. (2010, June). *Innovatief onderwijs ontwerpen in het gezondheidsdomein*. Inaugural address, June 4, Maastricht University, The Netherlands.
- Van Merriënboer, J. J. G. (2010, June). *Ontwerpen en onderzoeken als onderwijsconcept*. Discussant at the OnderwijsResearchDagen (ORD), June 23-25, Enschede, The Netherlands.
- Van Merriënboer, J. J. G. (2010, June). *Modelprogressie in digitale leeromgevingen*. Discussant at the OnderwijsResearchDagen (ORD), June 23-25, Enschede, The Netherlands.
- Van Merriënboer, J. J. G. (2010, June). *Competentiegericht onderwijs: van 4C/ID tot FLEX-ID*. Workshop for ID College, June 8, Leiden, The Netherlands.
- Van Merriënboer, J. J. G. (2010, June). *An introduction to four-component instructional design*. Workshop for Air Traffic Control The Netherlands (LVNL), June 16, Amsterdam Schiphol, The Netherlands.
- Van Merriënboer, J. J. G. (2010, June). *Instructional design for lifelong learning*. Presentation for the Symposium on behalf of the retirement of Jos Moust, Lifelong Learning in Health, June 11, Maastricht University, The Netherlands.
- Van Merriënboer, J. J. G. (2010, June). *An introduction to four-component instructional design*.

- Presentation for the FHML Honours Programme, June 15, Maastricht University, The Netherlands.
- Van Merriënboer, J. J. G. (2010, August). *Lifelong Learning in Aviation and Medicine*. Invited symposium for the EARLI SIG 14 Conference Learning and Professional Development, August 25-27, Munich, Germany.
- Van Merriënboer, J. J. G. (2010, September). *Educating the future doctor: An instructional design perspective (or, beyond PBL)*. Presentation at the Annual Conference of the Association for Medical Education in Europe (AMEE), September 4-8, Glasgow, Scotland.
- Van Merriënboer, J. J. G. (2010, September). *Applications of Cognitive Load Theory in Medical Education*. Presentation at the Annual Conference of the Association for Medical Education in Europe (AMEE), September 4-8, Glasgow, Scotland.
- Van Merriënboer, J. J. G. (2010, October). *Designing the integrated curriculum with the 4C/ID-model*. Invited keynote for the 3rd Conference of Innova-Cesal, October 13-15, Bucuramanga, Colombia.
- Van Merriënboer, J. J. G. (2010, October). *4C/ID: van leerdoelgericht naar competentiegericht opleiden*. Workshop for SYNTRA Vlaanderen, October 4, Brussels, Belgium.
- Van Merriënboer, J. J. G. (2010, October). *Effectief innoveren met 4C/ID*. Presentation for InHolland University of Applied Sciences, October 8, Hoofddorp, The Netherlands.
- Van Merriënboer, J. J. G. (2010, November). *FLEX-ID: Een kritische reflectie op drie casussen*. Workshop for ID College, November 9, Zoetermeer, The Netherlands.
- Van Merriënboer, J. J. G. (2010, November). *Instructional design for complex learning*. Presentation for the Research Master Learning in Interaction, November 30, Utrecht University, The Netherlands.
- Van Merriënboer, J. J. G. (2010, December). *Instructional design and learning with multimedia*. Invited Keynote for the Kaplan Europe Academic Excellence Summit, December 1, London, England.
- Van Merriënboer, J. J. G. (2010, December). *4C/ID: Four components instructional design*. Presentation for the Master Educational Sciences, December 7, VU Brussels, Belgium.
- Van Merriënboer, J. J. G. (2010, December). *Effectief innoveren met 4C/ID*. Presentation for the Master Evidence Based Instruction and Teaching (MEBIT), December 9, Maastricht University, The Netherlands.
- Van Merriënboer, J. J. G. (2010, December). *4C/ID – Four components instructional design*. Presentation for Erasmus University Rotterdam, December 15, Rotterdam, The Netherlands.
- Van Merriënboer, J. J. G. (2009, January). *Adaptive Learning Environments based on Four-component Instructional Design*. Invited keynote for the Symposium Harnessing Collective Intelligence in E-learning Environments of ITEC (Interdisciplinary research on Technology, Education and Communication), January 8-9, 2009, Kortrijk, Belgium.
- Van Merriënboer, J. J. G., & Corbalan, G. (2009, April). *Scaffolding Self-Directed Learning through Shared Control*. Presentation at the Annual Conference of the American Educational Research Association (AERA), April 13-17, 2009, San Diego, USA.
- Van Merriënboer, J. J. G. (2009, May). *20 jaar ICO: Een Retrospectief en Discussie over de Toekomst*. Presentation at the Onderwijsresearchdagen (ORD), May 27-29, 2009, Leuven, Belgium.
- Van Merriënboer, J. J. G. (2009, August). *Research on Instructional Design for Lifelong Learning*. Invited keynote for the Bi-annual Conference of the European Association for Research on Learning and Instruction (EARLI), August 25-29, 2009, Amsterdam, The Netherlands.
- Van Merriënboer, J. J. G. (August, 2009). Emerging Research Front article selection from the field of psychiatry/psychology: Cognitive load theory and complex learning: Recent developments and future directions, commentary by Jeroen J. G. van Merriënboer. *ScienceWatch*. See <http://sciencewatch.com/dr/erf/2009/09augerf/09augerfMerr/>
- Van Merriënboer, J. J. G. (2009, September). *Cognition and Instruction for Complex Learning*. Invited keynote for the Annual Educational Psychology Conference of the PAEPS, September 7-

- 9, 2009, Saarbrücken, Germany.
- Van Merriënboer, J. J. G. (2009, September). *De vier componenten in competentiegericht onderwijs*. Presentation for MBO 2010, September 30, 2009, Nijkerk, The Netherlands.
- Van Merriënboer, J. J. G. (2009, December). *Met 4C/ID naar uitdagende leertaken: Cognitie, metacognitie en motivatie*. Presentation for Consortium Beroepsonderwijs, December 10, 2009, Voorthuizen, The Netherlands.
- Van Merriënboer, J. J. G. (2009, December). *Competentiegericht onderwijs volgens 4C/ID*. Presentation for ARCUS College, December 17, 2009, Heerlen, The Netherlands.