

PENSUMLISTE

Høst 2019

Institutt for lærerutdanning

Master i matematikdidaktikk (1-7)

Master i matematikdidaktikk (5-10)

NORGES TEKNISK-NATURVITENSKAPELIGE UNIVERSITET

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Master i matematikdidaktikk trinn 1-7

LMM14001 Perspektiver på tallbegrepet (1-7) emne 1

Med forbehold om endringer, er pensum i emnet som følger

Bøker

Burton, David M. (2011). Elementary number theory. McGraw-Hill. New York.

Artikler og kapitler (Legges ut i Blackboard ved semesterstart)

Hersh, R. (1997), What is Mathematics, Really?, kapittel 1, Oxford University Press.

Lindstrøm T. (1995), Kalkulus, side 61-92, Universitetsforlaget AS.

Hansen, Skott og Jess (2007), Ypsilon, side 174-195, Frederiksberg: Forlaget Samfundslitteratur.

Kilhamn (2011), Making sense of negative numbers, side 18-54, doktorgradsavhandling, University of Gothenburg.

Selter et.al (2012), Taking away and determining the difference—a longitudinal perspective on two models of subtraction and the inverse relation to addition, Educ. Stud. Math. 79:389–408.

Tirosh, D. & Even R. (1997), To define or not to define: the case of $(-8)^{1/3}$, Educational Studies in Mathematics, Vol. 33, No. 3., pp. 321-330.

Mosvold (2002), Genesis principles in mathematics education.

Duval (2004), A crucial issue in mathematics education: The ability to change representation register, in Proceedings of the 10th International Conference on Mathematics Education, Copenhagen.

Goldin & Shteingold (2001), Systems of Representations and the Development of Mathematical Concepts, fra The Roles of Representations in School Mathematics, National Council of Teachers of Mathematics.

Steinbring (1998), Elements of Epistemological knowledge for mathematics teachers, Journal of Mathematics Teacher Education 1: 157–189.

Zazkis & Gadowsky (2001), Attending to Transparent Features of Opaque Representations of Natural Numbers, fra fra The Roles of Representations in School Mathematics, National Council of Teachers of Mathematics.

Rønning (2012), Symmetrisation of an asymmetric multiplication task, Proceedings of NORMA 11, The sixth Nordic Conference on Mathematics Education (s. 553-563). Reykjavik: University of Iceland Press.

Rønning (2012), Making sense of fractions in different contexts, Proceedings of the British Society for Research into Learning Mathematics 32(3).

Fosnot (2007), Ages and Timelines, Subtractions on the open number line, utdrag, Heinemann USA.

Schou, Skott, Jess & Hansen (2008), Omega, kapittel 1 og 6, Frederiksberg: Forlaget Samfundslitteratur.

Lorentzen (2012), Hva er matematikk?, kapittel 3, Universitetsforlaget.

Gravemeijer (2007), Emergent Modelling as a Precursor to Mathematical Modelling, fra Modelling and Applications in Mathematics Education, Springer US.

Van Den Heuvel-Panhuizen (2003), The Didactical Use of Models in Realistic Mathematics Education: An Example from a Longitudinal Trajectory on Percentage English, Educational Studies in Mathematics, Vol. 54, No. 1.

Lesh (2003), How Mathematizing Reality is Different from Realizing Mathematics, fra Mathematical Modelling: A Way of Life, Woodhead Publishing.

English (2003), Mathematical Modelling With Young Learners, fra Mathematical Modelling: A Way of Life, Woodhead Publishing.

Reality-based tasks for school, Booklet, LEMA 2009.

LMM14002 Læring og undervisning av matematikk (1-7)

Med forbehold om endringer, er pensum i emnet som følger:

Bøker

Fraleigh, J. B. (1989). *A first course in abstract algebra*. Reading, MA: Addison-Wesley. (utdrag deles ut)

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Red.). Cambridge, MA: Harvard University Press. (utdrag deles ut)

Artikler

Balacheff, N. (1988). Aspects of proof in pupils' practice of school mathematics. I D. Pimm (Red.), *Mathematics, teachers and children* (s. 216-235). London: Hodder & Stoughton.

Becker, J. R., & Rivera, F. (2006). Sixth graders' figural and numerical strategies for generalizing patterns in algebra. In *Proceedings of the 28th annual meeting of the North American chapter of the international group for the psychology of mathematics education* (Vol. 2, pp. 95-101). Mérida: Universidad Pedagógica Nacional.

Duval, R. (2006). A cognitive analysis of problems of comprehension in a learning of mathematics. *Educational Studies in Mathematics*, 61(1), 103-131.

Harel, G. (2008). What is mathematics? A pedagogical answer to a philosophical question. In R. B. Gold & R. Simons (Red.), *Proof and Other Dilemmas: Mathematics and Philosophy* (s. 265-290). Washington, DC: Mathematical Association of America.

Kaput, J. J. (2008). What is algebra? What is algebraic reasoning? I J. J. Kaput, D. W. Carraher, & M. L.

Blanton (Red.), *Algebra in the early grades* (s. 5–18). Mahwah, NJ: Erlbaum.

Kieran, C. (2004). The core of algebra: Reflections on its main activities. I K. Stacey, H. Chick, & M. Kendal (Red.), *The future of the teaching and learning of algebra: The 12th ICMI Study* (s. 21-33). Dordrecht, Nederland: Kluwer Academic Publishers.

Knuth, E. J., Choppin, J. M., & Bieda, K. N. (2009). Proof: Examples and beyond. *Mathematics Teaching in the Middle School*, 15(4), 206-211.

Lannin, J. K. (2005). Generalization and justification: The challenge of introducing algebraic reasoning through patterning activities. *Mathematical Thinking and Learning*, 7(3), 231-258.

Lester, F. K. (2005). On the theoretical, conceptual, and philosophical foundations for research in mathematics education. *ZDM*, 37(6), 457-467.

Presmeg, N. (2006). Semiotics and the “connections” standard: Significance of semiotics for teachers of mathematics. *Educational Studies in Mathematics*, 61(1), 163-182.

Sfard, A. (1991). On the dual nature of mathematical conceptions: Reflections on processes and objects as different sides of the same coin. *Educational studies in mathematics*, 22(1), 1-36.

Sfard, A. (2006). Participationist discourse on mathematics learning. I J. Maas & W. Schloeglmann

(Ed.), *New mathematics education research and practice* (pp. 153–170). Rotterdam, Nederland: Sense.

Sfard, A. (2007). When the Rules of Discourse Change, but Nobody Tells You: Making Sense of Mathematics Learning From a Commognitive Standpoint. *Journal of the Learning Sciences*, 16(4), 565-613.

Sfard, A. (2009). Moving between discourses: From learning-as-acquisition to learning-as-participation. *AIP Conference Proceedings*, 1179(1), 55–58.

Skemp, R. R. (1976). Relational understanding and instrumental understanding. *Mathematics Teaching*, 77(1), 20-26.

Stylianides, G. J. (2008). An analytic framework of reasoning-and-proving. *For the Learning of Mathematics*, 28(1), 9-16.

Stylianides, G. J. (2010). Engaging Secondary Students in Reasoning and Proving. *Mathematics Teaching*, 219, 39-44.

Stylianides, A. J., & Ball, D. L. (2008). Understanding and describing mathematical knowledge for teaching: Knowledge about proof for engaging students in the activity of proving. *Journal of mathematics teacher education*, 11(4), 307-332.

Stylianides, G. J., & Stylianides, A. J. (2009). Facilitating the transition from empirical arguments to proof. *Journal for Research in Mathematics Education*, 314-352.

Warren, E., & Cooper, T. (2007). Repeating patterns and multiplicative thinking: Analysis of classroom interactions with 9-year-old students that support the transition from the known to the novel. *The Journal of Classroom Interaction*, 7-17.

Warren, E., & Cooper, T. (2008). Generalising the pattern rule for visual growth patterns: Actions that support 8 year olds' thinking. *Educational Studies in Mathematics*, 67(2), 171-185.

LMM15005 Vitenskapsteori og metode, matematikdidaktikk

(1-7)

Bøker

Cohen, L., Manion, L. & Morrison, K. (2018). *Research methods in education* (8. utg.). NY: Routledge.

Rienecker, L., & Jørgensen, P.S. (2018). *Den gode oppgaven* (2. utg.). Bergen: Fagbokforlaget.

Artikler og annen litteratur

Artikler og annen litteratur blir lagt ut på BlackBoard

Master i matemaikkdidaktikk trinn 5-10

LMM54001 Læring og undervisning av matematikk (5-10)

Med forbehold om endringer, er pensum i emnet som følger:

Bøker

Fraleigh, J. B. (1989). *A first course in abstract algebra*. Reading, MA: Addison-Wesley. (utdrag deles ut)

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Red.). Cambridge, MA: Harvard University Press. (utdrag deles ut)

Artikler

Balacheff, N. (1988). Aspects of proof in pupils' practice of school mathematics. I D. Pimm (Red.), *Mathematics, teachers and children* (s. 216-235). London: Hodder & Stoughton.

Becker, J. R., & Rivera, F. (2006). Sixth graders' figural and numerical strategies for generalizing patterns in algebra. In *Proceedings of the 28th annual meeting of the North*

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Kieran, C. (2004). The core of algebra: Reflections on its main activities. I K. Stacey, H. Chick, & M. Kendal (Red.), *The future of the teaching and learning of algebra: The 12th ICMI Study* (s. 21-33). Dordrecht, Nederland: Kluwer Academic Publishers.

Knuth, E. J., Choppin, J. M., & Bieda, K. N. (2009). Proof: Examples and beyond. *Mathematics Teaching in the Middle School*, 15(4), 206-211.

Lannin, J. K. (2005). Generalization and justification: The challenge of introducing algebraic reasoning through patterning activities. *Mathematical Thinking and Learning*, 7(3), 231-258.

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Presmeg, N. (2006). Semiotics and the “connections” standard: Significance of semiotics for teachers of mathematics. *Educational Studies in Mathematics*, 61(1), 163-182.

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LMM54002 Historiske og filosofiske aspekter ved matematikkfaget (5-10)

Kontakt emneansvarlig: Liping Ding, e-post: liping.ding@ntnu.no

LMM55005 Vitenskapsteori og metode, matematikdidaktikk (5-10)

Bøker

Cohen, L., Manion, L. & Morrison, K. (2018). *Research methods in education* (8. utg.). NY: Routledge.

Rienecker, L., & Jørgensen, P.S. (2018). *Den gode oppgaven* (2. utg.). Bergen: Fagbokforlaget.

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