RME CURRENT REPORTS INSTRUCTIONS

Summary information

Presenters at BSRLM Day Conferences (and associated New Researchers' Days) will be sent an email inviting them to submit an Informal Proceedings paper. If they do so, they may also submit a Current Report to the journal Research in Mathematics Education. The first submission deadline will be stated in the email and will be approximately six weeks after the associated conference. The Current Reports Editor reviews submissions and sends further instructions to individual authors.

Queries to Lara Alcock

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Current reports in RME

Research in Mathematics Education (RME) the official journal of the British Society for Research into Learning Mathematics (BSRLM). It is an international English language journal, publishing original refereed articles on all aspects of mathematics education. Two issues of the journal are produced each year, of approximately 100 pages each (we will soon be moving to three issues).

One section of each issue of RME is devoted to Current Reports. Each Current Report is a 2-page summary of a research paper that has recently been published in the online informal proceedings of the meetings of BSRLM. This allows BSRLM to showcase the research carried out by its members; if your summary is accepted then information about your research will reach a wide international readership.

(Reminder: Anyone can submit an ordinary paper to RME without previously having an IP paper or a current report. See http://www.tandf.co.uk/journals/rrme/ and click on "Instructions for Authors". Alternatively, the editors welcome enquiries at rme@uea.ac.uk.)

Current reports submission specifications

1. Current Reports should be not more than 800 volume equivalent in length. The term "volume equivalent" means that the count must include the title, abstract, figures, tables and references, where a figure or table is counted for as many words as would take up the same space. An example of a Current Report is appended to this document so you can see what is broadly required.
2. Submission of the Current Report should be as a Microsoft WORD document with file name <firstauthor_RMECR_six-digit-date> (e.g. Smith_RMECR_311210). You should also send, at the same time and as a separate file, a copy of your six-page paper submitted for the Informal Proceedings following the BSRLM meeting. Both should be sent to the Current Reports Editor, Lara Alcock, at l.j.alcock@lboro.ac.uk.
3. Text should be left-justified.
4. Each Current Report should include the following. They will be expected to comply with the above requirements in full to be accepted for publication.
    a. Title (given the restriction in word length, you may choose to shorten the title of the paper presented at the day conference).
    b. Name(s), institutional affiliation(s) and email address(es) of the authors.
    c. Statement of what the study is about, and why it is of significance.
    d. Statement of what was done in the study and why.
    e. Description (where relevant) of how data were analysed and with what results.
    f. Reflections on the study and an indication of how the research might be developed;

g. Declaration of sponsorship of research reported (e.g. by research councils, government departments and agencies etc). This should appear at the end of the text and before the references.

h. References. These should conform to the Chicago author-date style. Detailed guidance can be found below. PLEASE FOLLOW THIS CAREFULLY.

5. The submission should be clearly structured, understandable and accessible to the national and international readership of the journal. Acronyms should be preceded by the title in full, and explained where necessary.

6. Relevant dates following the March 2011 BSRLM conference are:

   First submission deadline: 22nd April 2011

   (Response will follow approximately two weeks later)

   Resubmission deadline: 3rd June 2011

7. Due to limitations of space, it may occasionally prove impossible to publish all the Current Report submissions that comply with the above requirements. In such cases, decisions will be made on the basis of the desirability for balance of researcher experience amongst summaries published; and the preference for balance in topic and type of submission.

8. Research students are strongly encouraged to discuss a draft of their Current Report with their supervisor(s) before submission.

Referencing instructions

Citations and references should conform to Taylor & Francis Style F (Chicago author-date style), as exemplified below. PLEASE NOTE that this is different from some commonly-used styles in mathematics education.

Citations

For single author use (Skemp 1976). Note, no comma between name and date.

Give page numbers for quotations, e.g.

- Skemp (1976, 21)
- Laborde (2001, 94-95)

Where the author's name appears in the text, it need not be repeated in the parenthetical citation, e.g.

- According to Skemp (1976), 'understanding' has two distinct meanings.
- Singh's entertaining book (1997) became an international bestseller.

For works by two or three authors, all names are included, as in (Cowlishaw and Dunbar, 2000). Note, "and" not "&".

For works by more than three authors use (Brown et al. 1998). Note that et al. is not italicized in text citations.

References

Please make sure that you provide all the required information for each type of publication with italicizing and punctuation as in the examples. Notes about differences from APA style appear under "journal article" and similar concerns apply to other publication types.

Journal article

> Fischbein, E., D. Tirosh, and P. Hess. 1979. The Intuition of infinity. *Educational Studies in Mathematics* 10: 3-40.
>
> Sawyer, R.K. 2004. Creating teaching: Collaborative discussion as disciplined improvisation. *Educational Researcher* 23, no. 2: 12-20.
>
> Rousselle, L., and M. P. Noël. 2007. Basic numerical skills in children with mathematics learning disabilities: A comparison of symbolic vs. non-symbolic number magnitude processing. *Cognition* 102: 361–95.
>
> Notes:
>
> - only the first author's name is inverted;
> - a comma appears before and after the first author's initials;
> - the ampersand (&) is not used;
> - the date is not in parentheses;
> - titles have capital letters only at the beginning and after colons etc.;
> - titles of journals and names of publishers are capitalized but not abbreviated,
> - there is no comma before the volume number;
> - issue number is not needed unless the journal begins each issue at page 1;
> - there is a colon between the volume/issue number and pages;
> - only the changed part of the second page number is used, except for 10 to 19 where full numbers are used.

Book

> Sperber, D., and D. Wilson. 1986. *Relevance: Communication and cognition*. Oxford: Basil Blackwell.

Edited book

Nesher, P., and J. Kilpatrick, eds. 1990. *Mathematics and cognition: A research synthesis by the International Group for the Psychology of Mathematics Education*. Cambridge: Cambridge University Press.

Chapter in an edited book

Fuson, K. C. 1991. Children's early counting: Saying the number-word sequence, counting objects, and understanding cardinality. In *Language in mathematical education*, ed. K. Durkin and B. Shire, 27-39. Milton Keynes: Open University Press.

Thesis

Hemmi, K. 2006. Approaching proof in a community of mathematical practice. PhD diss., Stockholm University.

Paper in edited conference proceedings

Watson, A. and J. Mason. 2002. Extending example spaces as a learning/teaching strategy in mathematics. In *Proceedings of the 26th Conference of the International Group for the Psychology of Mathematics Education*, ed. A. Cockburn and E. Nardi, Vol. 4, 377-385. Norwich, UK: University of East Anglia.

Paper in RME volumes 2-9

Threlfall, J. 2000. Mental calculation strategies. In *Research in Mathematics Education* Volume 2, ed. T. Rowland and C. Morgan, 27-39. London: British Society for Research into Learning Mathematics.

Paper in BSRLM day-conference proceedings, before 2000

Rowland, T., and L. Bills. 1996. Examples, generalisation and proof. *Proceedings of the Conference of the British Society for Research in Learning Mathematics held at the Institute of Education, University of London*: 1-7.

Paper in BSRLM day-conference proceedings, after 2000

Rowland, T. 2002. Diagnostic tools and pedagogical content knowledge: A response. *Proceedings of the British Society for Research into Learning Mathematics* 22, no. 1: 59-64.

Report

Department for Education and Skills. 2001. *Guidance to support pupils with dyslexia and dyscalculia (No. DfES 0512/2001).* London: DfES.

Web reference

Qualifications and Curriculum Development Agency. 2009. AS/A-level criteria in mathematics subjects: Consultation. http://www.qcda.gov.uk/21230.aspx (accessed February 13, 2010).

Order in references

Entries are arranged alphabetically by author and, for multiple papers by the same author, chronologically by year of publication (as usual). For successive entries by the same author(s), a 3-em dash replaces the name(s) after the first appearance, e.g.

Piaget, J. 1929. *The child's conception of the world*. New York: Harcourt, Brace and Company.

——— 1970. *Le structuralisme*. Paris: Presses Universitaires de France.

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CURRENT REPORT

Practitioner use of graphing software to teach about algebraic forms

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This study (Ruthven, Deaney, and Hennessy 2009) develops a line of research on the incorporation of digital technologies into the mainstream practice of mathematics teaching in secondary schools.

Case identification started by triangulating recommendations from professional leaders and evaluations from school inspections to identify professionally well-regarded mathematics departments. Such departments were then invited to describe successful practice involving use of computer-based tools and resources. Use of graphing technology was widely nominated as a successful established practice, with linear and quadratic equations being frequently mentioned topics. Use of graphing technology to treat such equations also featured prominently in official guidance.

The practice of two teachers was chosen for more intensive study, in the form of one lesson taught by each teacher on linear forms and another on quadratic. Detailed observation records were made, also incorporating transcripts of the main episodes, copies of resources used, and records of graphs displayed. Post-lesson interviews were organised around prompt cards asking teachers about their thoughts while preparing the lesson, and then looking back on it. The resulting file for each lesson was first analysed to create a lesson summary outlining working environment, resource system, lesson agenda, and activity structure, followed by the main lines of pedagogical thinking reported by teachers. An analysis was then conducted across lessons and teachers, employing the broad themes from the compact version of the 'practitioner theory' developed in earlier research (Ruthven and Hennessy 2003).

The resulting practitioner model of the contribution of graphing software to the teaching of algebraic forms can be summarised in the following terms:

- *effecting working processes and improving production* through making it easier to produce graphs accurately and rapidly, so increasing the efficiency and pace with which related topics can be covered;
- *overcoming pupil difficulties and building assurance* through making graphing tasks more accessible to students who have difficulties with organisation and presentation;
- *supporting processes of checking, trialling and refinement* through enabling lesson tasks based on trial and improvement, and supporting mathematical speculation and experimentation within and beyond the lesson agenda;
- *focusing on overarching issues and accentuating important features* through helping to bring out the effects of altering particular coefficients or

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parameters in an equation on the properties of its graph, and through facilitating comparison of gradients and examination of limiting trends;
- *enhancing the variety and appeal of classroom activity* through reducing 'laborious' written work, increasing the immediacy and interactivity of classroom tasks, and supporting challenge within lessons;
- *fostering pupil independence and peer exchange* through providing support for exploration by students and consequent sharing of discoveries: including software techniques and mathematical ideas.

Sensitised by literature review and wider theory in the field to aspects of teaching practice which remained largely tacit in this model, further key issues were examined.

Although teachers described such software as "instinctive" and "user-friendly", they played an important role in inducting and supporting students into its use for mathematical purposes. If core techniques required for a lesson were not sufficiently familiar to the class, teachers introduced or reviewed them. More serendipitously, they also allotted short periods to playful exploration of the software by students, and to sharing of new techniques. Supporting and developing use of the software was also an important dimension of teacher interaction with students while they were working on tasks. Interventions were observed, in which teachers guided basic operation of the software, prompted strategic mathematical action with it, and supported mathematical interpretation of its results.

Essentially, the learning goal of these lessons was to induct students into an accepted mathematical organisation of the multimodal systems constituted by equations of the types $y=mx+c$ or $y=ax^2+bx+c$ and their graphs. Achieving such an organisation depends on managing the double semiotic of the system through coordinating algebraic and geometric registers, while also managing its multi-dimensionality through isolating phenomena and controlling variables. Such didactical organisation by teachers (and the curricular resources that they drew on) underpinned the use of graphing software to help students grasp how altering a coefficient in an equation affected the appearance of its graph.

Accordingly, this study has illustrated how, in the course of appropriating the technology, teachers adapt their classroom practice and develop their craft knowledge: particularly by establishing a coherent resource system that effectively incorporates the software; by adapting activity formats to exploit new interactive possibilities; by extending curriculum scripts to encompass instrumentation of classroom graphing by machine, and to provide for proactive structuring and responsive shaping of activity; and by reworking lesson agendas to take advantage of the new time economy.

Acknowledgements

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References

Ruthven, K., R. Deaney, and S. Hennessy. 2009. Using graphing software to teach about algebraic forms: A study of technology-supported practice in secondary-school mathematics. *Educational Studies in Mathematics* 71, no. 3: 279–97.

Ruthven, K. and S. Hennessy. 2003. Successful ICT use in secondary mathematics – a teacher perspective. *Micromath* 19, no. 2: 20–24.