THE USE OF A STUDENT MODEL IN A MULTIMEDIA APPLICATION TO CONFIGURE LEARNING

TREVOR BARKER

A thesis submitted in partial fulfilment of the requirements of the University of Hertfordshire for the degree of

Doctor of Philosophy

August 1999
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The programme of research was carried out in the Department of Computer Science, University of Hertfordshire

August 1999
To the memory of my parents

Alfred and Nellie Barker

and to my brothers

Tony and Graham Barker
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List of Publications and Presentations

1. The creation of task-based differentiated learning materials for students with learning difficulties and/or disabilities.
   Trevor Barker, Sara Jones, Carol Britton and David Messer

2. Evaluation of Horizon Multimedia Learning Materials for Students with Learning Difficulties and Disabilities
   Trevor Barker, Sara Jones, Carol Britton and David Messer
   Presented at ALTC-97 University of Wolverhampton, September, 1997

3. Creating Horizon multimedia learning applications to support students with learning difficulties and disabilities.
   Trevor Barker
   Proceedings of EURO EDUCATION 98 Conference, Aalborg Denmark, May 1998

4. Investigation into the effect of Language on Performance in a Multimedia Food Studies Application.
   Trevor Barker, Sara Jones, Carol Britton and David Messer
   To be presented at Interact 99, Edinburgh, September 1999

5. Report of a pilot study of an individually configurable multimedia learning prototype based on a co-operative student model of learner characteristics.
   Trevor Barker, Sara Jones, Carol Britton and David Messer
   To be presented at ALT-C99, September 1999
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AI</td>
<td>Artificial Intelligence</td>
</tr>
<tr>
<td>ALBSU</td>
<td>Adult Literacy and Basic Skills Unit</td>
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<tr>
<td>ANOVA</td>
<td>Analysis of Variance</td>
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<tr>
<td>CAI</td>
<td>Computer-Assisted Instruction</td>
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<td>CAL</td>
<td>Computer-Assisted Learning</td>
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<td>CAM</td>
<td>Cognitive Apprenticeship Model</td>
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<td>CBT</td>
<td>Computer-Based Training</td>
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<td>CD-ROM</td>
<td>Compact Disk-Read Only Memory</td>
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<td>CF</td>
<td>Cognitive Flexibility</td>
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<td>CML</td>
<td>Computer-Managed Learning</td>
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<td>CSA</td>
<td>Cognitive Styles Analysis</td>
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<tr>
<td>CSCW</td>
<td>Computer-Supported Co-operative (or Collaborative) Work</td>
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<tr>
<td>DL</td>
<td>Discussion-Level</td>
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<td>EB</td>
<td>Electronic Book</td>
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<td>Electronic Performance Support Systems</td>
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<td>FE</td>
<td>Further Education</td>
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<td>Further Education Development Agency</td>
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<td>GCSE</td>
<td>General Certificate of Secondary Education</td>
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<td>General National Vocational Qualification</td>
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<td>Higher National Diploma</td>
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<td>IBM</td>
<td>International Business Machines</td>
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<td>ICT</td>
<td>Information and Communications Technology</td>
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<td>IES</td>
<td>Intelligent Educational System</td>
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<td>PC</td>
<td>Personal Computer</td>
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<td>Programmed Instruction</td>
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<td>Perspectives Interaction Paradigm</td>
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<tr>
<td>PL</td>
<td>Programmed Learning</td>
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<tr>
<td>PLATO</td>
<td>Programmed Logic for Automated Teaching Operations</td>
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<tr>
<td>SIM</td>
<td>Styles Initiating Module</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>SMOG(^1)</td>
<td>Standard Measure of Gobble-de-gook</td>
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<tr>
<td>S-R</td>
<td>Stimulus-Response</td>
</tr>
<tr>
<td>TICCIT</td>
<td>Time-shared Interactive Computer Controlled Information Television</td>
</tr>
<tr>
<td>TL</td>
<td>Task-Level</td>
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<tr>
<td>TLTP</td>
<td>Teaching and Learning Technology Programme</td>
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<td>VI</td>
<td>Verbaliser-Imager</td>
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<td>WA</td>
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<td>WAVI</td>
<td>Wholist-Analyst/Verbaliser-Imager</td>
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\(^1\) Personal communication from the Basic Skills Agency, London.