

An investigation into the concept of mind mapping and the use of mind mapping software to support and improve student academic performance.

Brian Holland (B.Holland@wlv.ac.uk)

School of Art and Design

Lynda Holland (Lynda.Holland@wlv.ac.uk)

Jenny Davies (J.Davies2@wlv.ac.uk)

School of Computing and Information Technology

Background and rationale

This project set out to investigate if the technique of mind mapping could be used to improve the study and planning skills of second year Digital Media students from the School of Art and Design (SAD) and first year students on the History of Computing module from the School of Computing and Information Technology (SCIT). Both sets of students were shown how mind mapping could be used to plan the different types of work that they needed to undertake for their modules. MindManager software was installed in selected computer labs and the students were given tuition on how to use the software.

Both sets of students involved in the project were seen to be computer literate and use computers to produce the majority of their course work. Students within SAD and SCIT tend to prioritise practical course work and therefore fail to develop appropriate skills that enable them to achieve good grades for written work. Often they fail because they have not developed appropriate skills in the organization and presentation of ideas, concepts and research. This weakness is often present in their practical work as well, but students are inclined to compensate by expending considerably more time and resources in their practical activities. It was anticipated that by introducing the students to the concept of mind mapping and the use of MindManager software that their study skills performance would be improved by providing them with a visual way to plan not just essay writing but also the more practical work that they undertake.

Mind mapping is a visual way to record and organize information where a 'map' is drawn up which does not rely on large amounts of written information, but on textual descriptors and graphical clues. Mind mapping concepts are thought to appeal to a wide variety of different learning styles, and because MindManager is an attractive and easy to use piece of software it should make the concept of planning work more appealing to students. The software exports information in outline form to word processing and presentation software, facilitating the link between the graphical organization of ideas and the realization of those ideas in written form.

It was thought that improving students' ability to plan out their work should lead to an improvement in the quality of the practical and written work that they submit and consequently in their grades and self esteem. Investigating the use of this technique with students from different schools would help identify needs that are generic and needs that are specific and help us to understand the difference. The introduction of effective software tools to assist student performance promotes the wider use of Technology Supported Learning across the learning environment.

The innovation

Questionnaires were designed and administered to students at the beginning and at the end of the first semester of the academic year 2003/4. Comprehensive materials to support the project were produced and included several presentations on the origins and uses of mind mapping as a technique and also to demonstrate the use of MindManager software. Workbooks were produced for the students. Minor differences were a consequence of the different essay title and content required of each group.

Focus group meetings were held with both sets of teaching staff and with students at the end of the module in order to ascertain staff reactions to the quality of student work submitted and students perceptions as to the effectiveness of mind mapping as a technique and MindManager as a software tool.

The questionnaire was essentially in two parts: one part with questions about the technique of mind mapping and the other about the software application MindMapping as a technique.

The results

Responses were received from 40 SAD students and from 79 SCIT students.

Figure 1: Understanding the concept

SCIT students

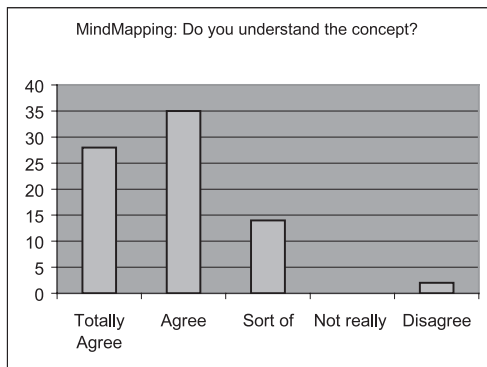


fig 1-a Understanding the concept (SCIT)

SAD students

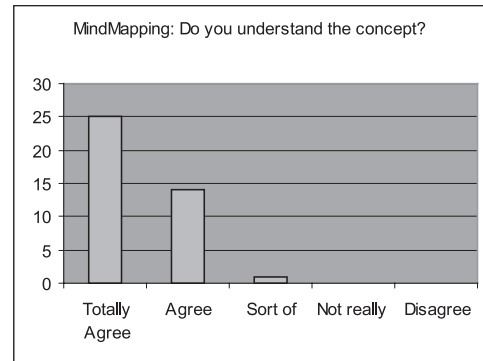


fig 1-b Understanding the concept (SAD)

Given that 62.5% of SAD students compared with 34% of SCIT students responded that they 'totally agreed' it would appear that SAD students seemed more confident in their understanding of the concept of mind mapping. This may be understandable given their visual culture.

Figure 2: Organisation

SCIT students

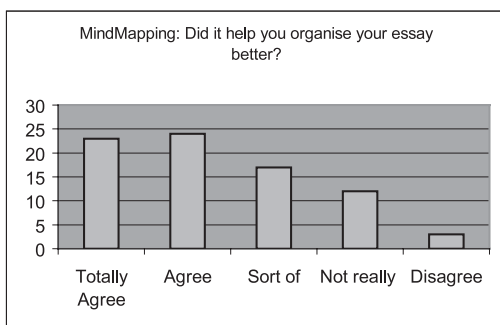


fig 2-a Organising your essay (SCIT)

SAD students

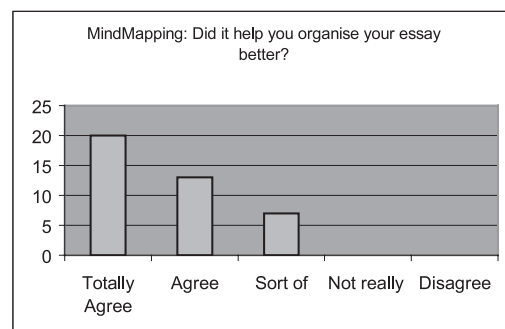
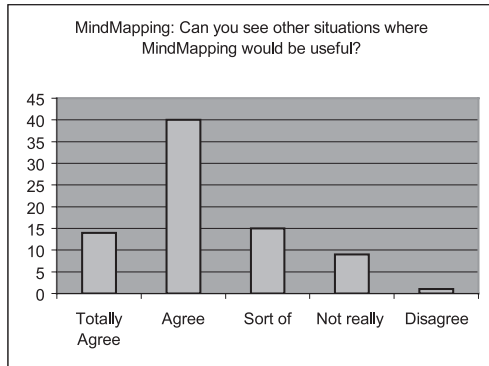


fig 2-b Organising your essay (SAD)

Again SAD students appear have a more positive response to this question although it must be noted that most students overall found the technique useful.

Figure 3: Extended use of technique

SCIT students



SAD students

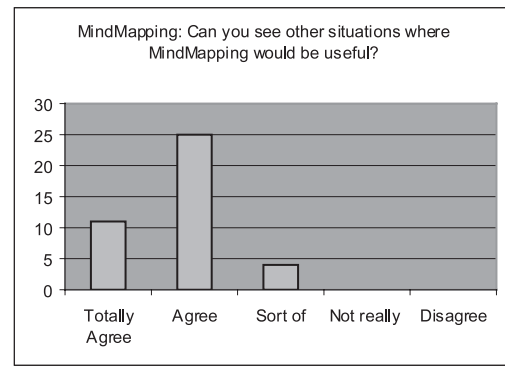


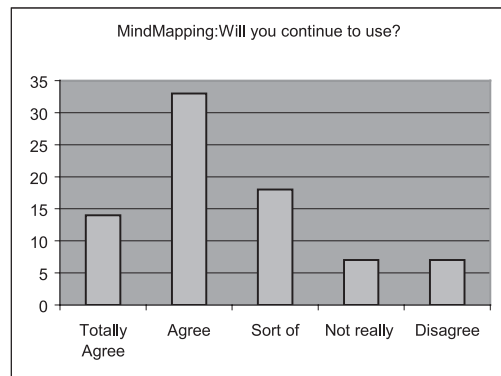
fig 3-a Extended use of the technique (SCIT)

fig 3-b Extended use of the technique (SAD)

There appears to be a consistent but small number of SCIT students that see no benefit to using this technique even though they claim to fully understand it.

Figure 4: Continued use of technique

SCIT students



SAD students

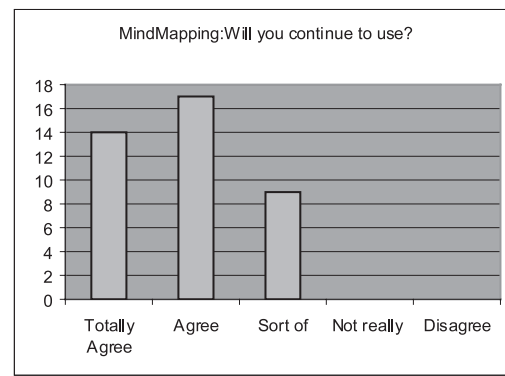


fig 4-a Continued use of the technique (SCIT)

fig 4-b Continued use of the technique (SAD)

The pattern of this result is very similar to the previous one however it is a significantly different question in that it seeks to understand if students see applications for mind mapping apart from essay planning. SAD students seemed to understand the benefit of using the technique for project managing their media projects which were in many cases team based activities.

The work done by the module teams to introduce the concept of mind mapping through presentation and workbook was clearly successful in helping students understand the technique and situations in which it could be applied. Only a very small number of students felt that the technique offered no practical assistance in improving their essay writing abilities while most felt that it had a very positive effect.

Comments from students in relation to this section include:

“Would prefer to do them by hand” (an SAD student)

“Mind mapping was a welcome and useful tool which has given me a positive outlook when approaching this type of work. Excellent addition to an educational module”

“Mind mapping played a major part in deciding on our final product.”
“Thank you for introducing me to mind manager”
“Good for planning and organising”

Further evidence of the effectiveness of the technique was obtained from feedback sessions with the students which helped confirm the results of the questionnaire. Feedback from the module tutors in relation to the effect on student essays also confirmed that in general the standard had improved over last year. It is interesting to note that although the number of fail grades did not alter significantly however closer examination revealed that lack of attendance and lack of engagement with the module activities in relation to the use of mind manager etc. were significant factors with these students. What was evident was that there were fewer grades at the lower end of the spectrum and a higher number of very good grades compared to the previous year.

Figure 5: Ease of use

SCIT students

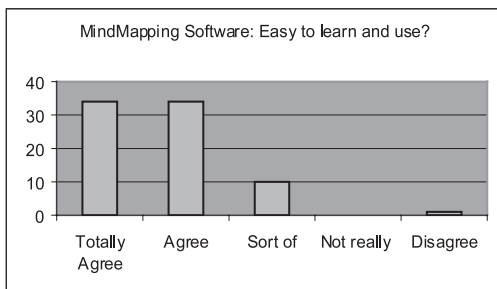


fig 5-a Ease of use (SCIT)

SAD students

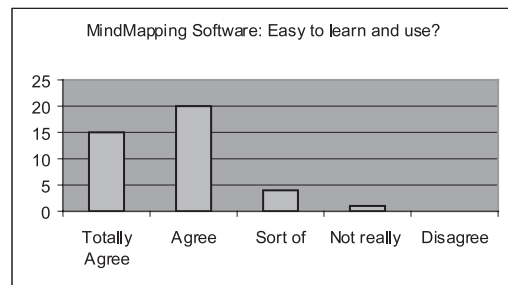


fig 5-b Ease of use (SAD)

Both sets of students were reasonably IT literate and it is only surprising that one of the SCIT students found it so difficult to learn. Not surprising though that SAD students found it a little more difficult.

Figure 6: Export to Word

SCIT students

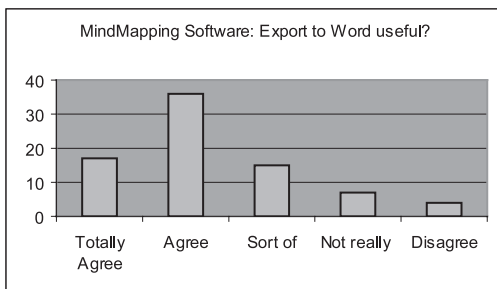


fig 6-a Export to Word (SCIT)

SAD students

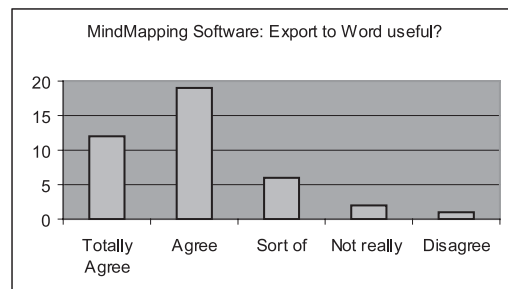
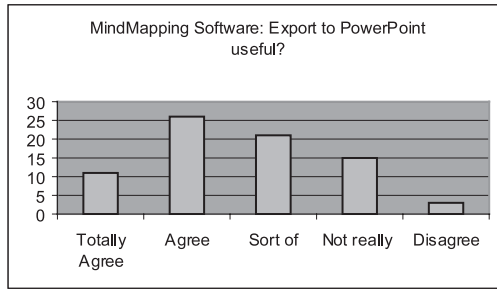


fig 6-b Export to Word (SAD)

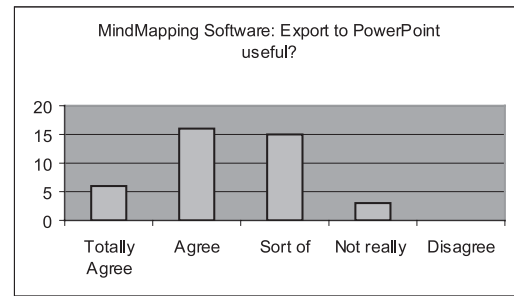
The results were very similar from both groups. Clearly this export function proved useful for them although it must be borne in mind that the assessment task was a word processed essay and the supplied workbook on MindManager had provided a significant level of scaffolding since the workbook task involved designing the structure of the student’s essay

Figure 7: Export to Powerpoint

SCIT students

**fig 7-a** Export to PowerPoint (SCIT)

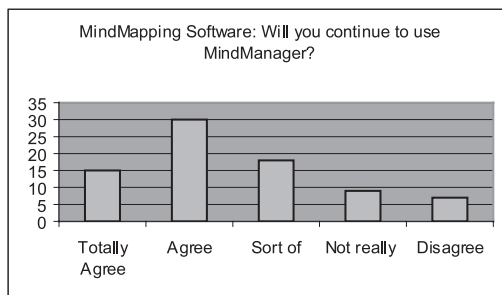
SAD students

**fig 7-b** Export to PowerPoint (SAD)

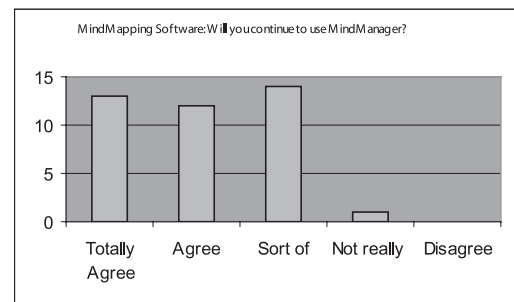
There was a less enthusiastic response to this question. Although a PowerPoint presentation was required as part of the assessment exercises for this module, students did not seem to find this feature as useful as the export to Word function.

Figure 8: Continued use

SCIT students

**fig 8-a** Continue with software (SCIT)

SAD students

**fig 8-b** Continue with software (SAD)

This response is not dissimilar from the response to the question in the previous section relating to the continued use of the mind mapping technique. It would seem that students would continue to use the software if they continued to use the technique.

Both groups of students would expect to use software applications within their specialist activities (Computer Science on the one hand and Digital Media on the other) so it was not surprising that overall they found a software application for the technique of mind mapping to be both easy to use and useful. Verbal feedback reinforced the findings of the questionnaire with students being very positive about the software and asking for it to be able in a larger number of computer labs as well as enquiring about the availability of personal copies for use on their own machines.

Comments on the questionnaires relating to software included

“Very good technique software difficult to obtain and use it”

“Great software will continue to use”

“make a copy available to download, not enough copies in only one computer suite”

Future developments

It has been encouraging to note the continued use of mind mapping, and MindManager, by students as they pursue project work in subsequent modules.

Overall this has been a very successful project with some valuable teaching materials having been developed and with students being introduced to a useful technique that has clearly helped in improving the structure, coherence and therefore the quality of their written work.

It is hoped that a further project will be go forward to disseminate what has been learned through this one and extend the use of mind mapping technique through the use of software applications including MindManager. Clearly there is scope to improve the academic performance through both written and practical work by providing students with the ability to plan and structure their projects more effectively.