

## Mind Mapping Project

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The Mind Mapping Project seeks to provide an interactive online e-learning environment that will become a permanent resource for teachers and students of philosophy of religion and related subjects. The seed of the project will be a series of mind maps charting the material covered within the Senior Honours philosophy of religion course taught in the Department of Philosophy at the University of Glasgow. Collaborators will be sought who wish to link their own mind maps, representing courses within related subject areas, with the philosophy of religion mind map to form a network of interrelated maps.

To see the mindmaps created by this project please go to our webpage (please note that these pages display best when using the Firefox browser, and that there remain some problems when using Internet Explorer that we are currently working on fixing):

<http://www.gla.ac.uk/Acad/Philosophy/mindmapping/>

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### 1. Outline of the project

The philosophy of religion mind mapping project was funded by an e-learning grant from the Subject Centre for Philosophical and Religious Studies of the Higher Education Academy. The project ran from July 2006 to June 2007. The aim of the project was to develop an interactive on-line e-learning environment, which would constitute a permanent resource for teachers and students of philosophy of religion and related subjects. At the core of the project is a series of mind maps charting the material covered within the senior honours philosophy of religion course, taught within the Philosophy Department at the University of Glasgow in the spring of 2007.

Mind maps are visual representations, organised around a central concept. They use lines to show the connections from secondary concepts to the central concept or between secondary concepts. Each node within the on-line mind maps represents a concept-or key aspect of a topic-and contains links to other resources, both within and external to the project's web site. Mind maps not only make complex concepts more accessible to students than do primarily text-based learning resources, they also assist students in generating ideas for essays as well as helping them to structure those ideas systematically.

The mind mapping project thus enhanced student learning by assisting students to understand how key concepts and ideas, explained within lectures and seminars, relate both to each other and to material covered within other

lectures and seminars. To this end, mind maps representing key lectures are linked to relevant locations within maps representing other key lectures. Thus, together these mind maps display a comprehensive overview of the conceptual terrain covered by the course. Students are also able to view a mind map displaying the entire top level of the course within one image.

The project's web site also enables students to access detailed information under the head of specific concepts by following links to other web-based resources from locations on mind maps. Locations on mind maps are also linked to discussion forums where students and teachers are able to discuss specific issues and share information and ideas.

Although the mind maps were developed from lectures delivered for a specific course, the web site that has been created from them is intended for use by a much wider audience (see section 8, below).

There were three people involved in the project:

**Dr Victoria Harrison:** The project leader and lecturer for the senior honours philosophy of religion course. She selected the resources to link to the mind maps as well as the topics to be mind mapped. She also developed the interface between moodle and the mind mapping web site.

**Dr Rhett Gayle:** He assisted in the development of the mind maps and in the original conception of the project. He also attended many of the classes and recorded them both for use within the project, as well as designing the questionnaire used to assess how useful the students found the project (see section 7, below).

**Mr Paul Smith:** Web-designer for the project. He dealt with issues arising from the presentation of the mind maps in an on-line environment. Specifically, he designed programs to convert mind maps into html files that could be read by a wider range of internet browsers than was possible on the conversion software included in the Mind Genius package that the project team had decided to adopt.

## 2. Apparatus

The philosophy of religion class was scheduled to meet twice a week for ten weeks. The weekly meetings both took place on Wednesdays. The first class was at 11.00 -11.50 and the second at 2.00 - 2.50. The rationale for this was that the students would hear a lecture about a topic in the morning class, and the afternoon class would provide a more interactive environment for them to assimilate and add to what they had learnt in the morning session. A range of activities were organised for the afternoon class, for example, small buzz-group discussions, seminars and class debates. The students were evaluated using an essay written early in the semester and an exam taken after the completion of the term. The end of the final exam was worth 70% the overall grade for the class. Some of the class essays and examination papers were graded by the lecturer, and the rest were assessed by other members of the philosophy department (see appendix A, below).

The students taking the course fell into four basic categories:

- 35 philosophy honours students - of this group, 10 were joint honours students and 25 were single honours, 2 were non-native English speakers, one student had visual disabilities and one student has learning difficulties.
- 2 students were on the Junior Year Abroad Program.
- 8 students were third years taking the MA in Philosophical and Religious Education in the Department of Religious Education in the Faculty of Education.
- 2 students were 1st year Mlitt students (i.e., graduates taking a conversion degree into Philosophy). One of these was a non-native English speaker.

The learning aims of the course were:

- To introduce the students to some of the core topics in contemporary philosophy of religion.
- To encourage the students to recognise the philosophical issues arising from religious ideas.
- To enable the students to use analytical arguments to evaluate the beliefs of a range of religions traditions, both monotheistic and non-monotheistic.

The intended learning outcomes were as follows:

Students should be able to:

- Show that they can analyse religious beliefs and the arguments adduced for and against those beliefs.
- Argue cogently about religious ideas.
- Expound and critically discuss at least one form of religious pluralism.
- Discuss critically the main philosophical issues involved in at least two of the traditional arguments for the existence of God.
- Explain the contrast between logical and evidential problems of evil.
- Understand how arguments based on experience can be adduced to support very different religious views.
- Understand some of the ways in which philosophical theories about the self shape religious beliefs.
- Discuss critically the relation between faith and reason.

After each key lecture, a mind map (or in some cases a set of mind maps) was constructed to map the content covered. The topics selected for mind mapping were those that most closely reflected the intended learning outcomes of the course. These topics were: What is Religion?; Religious Diversity (this was broken down into two further maps, Religious Pluralism and Transcendental Pluralism); Design Arguments (this was broken down into two further maps, Traditional Design Arguments and New Design Arguments); Ontological Arguments; Religious Experience; Early Buddhist Philosophy; The Nature of Persons; Enlightenment Experience; Evil; and Reason and Religious Belief. These topics were also selected to feature on the project's web site because they are all core topics within the philosophy of religion and thus are likely to be of relevance to many students and teachers within the discipline, not just those at the University of Glasgow.

### **3. Aims of the project**

#### **(a) Aims for the students on the course**

The project aimed to assist students to meet all of the learning aims and intended learning outcomes of the course. It aimed to do this by representing the core content and structure of the course through a series of interconnected mind maps. This strategy was intended to encourage the students to think about the course material synthetically rather than taking each topic as a self-contained unit with no points of contact to issues discussed under the head of other topics. The use of mind maps also acts as a model for a more effective method for note-taking and organising material for revision. So, a further aim of the project was to encourage students to adopt mind mapping as a methodology themselves.

Students have varying levels of interest in the material of any given course, and hence their motivation to explore beyond the basics of the course material also varies. By adding a high density of secondary sources directly to the mind maps, the project aimed to serve those students with high motivation to explore the ideas covered in the course further. It also aimed to lower the bar, so that the students who would benefit from further exploration, but who might lack the time or full motivation, could easily investigate beyond the requirements of the course.

Originally, we had planned to build a self-testing facility into the mind maps. The hope was that students would use

this to test their knowledge of the course material. Unfortunately, this aspect of the project proved too difficult to design given the constraints of the mind mapping software that we were using, as well as limitations imposed by the information technology management system at University of Glasgow.. One possibility to make up for this omission is to create automated tests on moodle that could be accessed through nodes on the mind maps.

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## **b) Wider aims of the project**

A wider aim of the project was to create a permanently available public resource for the benefit of students and teachers of philosophy of religion and related subjects. The project's web site was intended to serve as an example of how other teachers might use mind maps to facilitate learning within their own courses. Ultimately, the goal is to use the project's web site as the centre of a network of mind maps prepared by others working within the discipline. To this latter end, there is an invitation to collaborate featured at a high level on the project's web site. Emailed invitations to collaborate have also been distributed to members of the philosophical community (see appendix B).

## **4. Using the mind maps in class**

One challenge that the project team had to confront early on in the development of the project, and before the web site had been created, was how best to make the mind maps accessible to the students. In an early phase of the project we researched the possibility of using files created by Mind Genius software within moodle (which is the University of Glasgow's chosen virtual learning environment). Unfortunately, it emerged that moodle was unable to display Mind Genius files. Hence, the only way that students could directly view them was on one of the computer clusters on campus that had Mind Genius already installed. As an alternative to this, we tried exporting the Mind Genius files into html format and then uploading them to moodle. This experiment also failed. When a Mind Genius file is exported to html it does not create just one html file, but a host of connected html files. Moodle could only identify one of these files-and not a group of connected files-and thus was not able to display mind maps in html format at all. This difficulty hampered the use of the mind maps in the classroom until fairly late into the course when the web site was available.

Once the mind maps were on their own web site, it was possible to provide links to them from moodle. But this was a late achievement because a lot of work had to be done 'fixing' the exported files before it was possible to display them on the World Wide Web.

However, the mind maps were particularly useful during the revision classes that took place the week before the final exam. For these classes a booklet was created that contained the mind maps printed directly from the Mind Genius program rather than from the web site. Students were very enthusiastic about these booklets, and many reported that they were encouraged by them to use the mind mapping project's web site.

## **5. Constructing the web site**

Creating the mind maps and the web site to host them raised a number of technical difficulties. The first of which arose from the bewildering array of mind mapping software available on the market. The project team decided to use Mind Genius software because the University of Glasgow has a site licence for this package, and hence it seemed likely to be the most accessible to the students. Disability Services at the University of Glasgow also recommends Mind Genius software-promoting it as an assistive technology which can help certain disabled students to organise their notes and plan written assignments, as well as serving as a mnemonic learning tool for exam revision.

Learning how to create mind maps using the software was straightforward. Although, as explained above, putting the mind maps into a form that could be used directly in the classroom was more complex. However, the real problems began when we tried to export the Mind Genius files into html format for uploading onto the web site. It quickly became apparent that every file required a significant amount of technical alteration before it could be displayed on the web site. Moreover, the difficulty of making the resulting files readable by anything but the latest version of

Internet Explorer was also considerable-and at one stage looked set to become a project breaker. Specially written codes have now been inserted into each file to solve this particular problem. However, it is still the case that the mind maps are not viewable by Macintosh users.

Creating the on-line environment to host the mind maps was more complex than anticipated for a number of reasons. And this required extra input from each member of the project team. Key difficulties were raised by the need to make the site accessible to people with disabilities. The difficulties we experienced with this aspect of the project forced us to revise our original timetable for the publicity of the project. We decided to hold back our advertising until we had a working web site for people to examine.

A further set back arose concerning access to the project's web site by people with visual disabilities. Mind mapping is an inherently visual technology as it seeks to provide a visualisation of the connection between complex abstract concepts. Thinking about how to make the content of the site accessible to people with visual disabilities presented a considerable challenge to the project team. The original plan for the web site was to display the mind maps as images. However, this would have involved displaying text within images-thus making the information inaccessible by means of audio-output from screen readers. Consequently, we rejected this plan and explored other ways of exporting Mind Genius files into html format.

The version of the website that is now on-line has features which have been included specifically to render the site accessible to people with various kinds of disabilities. Every mind map has a fully accessible text only version that has all the information included on the mind maps as well as the links to resources and mental connections, all listed in linear form. Moreover, as well as being useful for people with visual disabilities, the text only versions of the mind maps can be used by everyone to print out and make notes on the resources (the mind maps themselves are not printer-friendly).

During the development phase of the web site, it gradually became clear that what we hoped to achieve could not be managed just with that web site alone. Consequently, some of the functions that were originally envisaged as being hosted on the mind mapping web site, came to be hosted on moodle: for example, a discussion forum and a feedback activity. These items are accessible through links on the mind maps that take the user into the moodle site, inviting them to create a user account if they have not logged onto the University of Glasgow's moodle site before.

The mind mapping web site was conceived partly to serve as a portal by means of which users could access reliable, scholarly material on the topics covered. The types of material that can be accessed directly from the mind maps include:

- Selected websites
- Pdf files containing scholarly articles or other educational material
- Word files containing relevant material
- Bibliographies
- Discussion forums
- Philosophy of Religion Blogs
- Powerpoint presentations
- Videos of interviews with prominent scholars
- Audio recordings of scholarly lectures and interviews
- Information about key publications
- Abstracts of relevant articles
- Audio and visual recordings of the lectures the maps are based upon

When we began designing the mind maps and populating them with these resources we did not always indicate what

type of resource was available through a link. We later saw this as a disadvantage, particularly to the visually impaired. Consequently, we changed the mind maps to indicate more clearly what kind of resources the user would be directed to if he or she followed a particular link. Ultimately, we would like to be able to insert a symbol indicating what kind of resource is available through specific links. However, this does not seem to be technologically possible at the present time. Another difficulty is that the mind mapping software we employed does not allow us the change the order in which linked material is presented. This has resulted in some of the most important or useful links being located towards the end of a list of resources just because they were added to the site later. A future goal is to redo all of the links and order linked material in lists that reflects the importance of the different materials.

## 6. Using the web site

Users enter the mind mapping web pages by going to the navigation page:

<http://www.gla.ac.uk/Acad/Philosophy/mindmapping/>

The navigation page displays the core mind map that indexes the main topics covered by the other mind maps included in the web site. Clicking on a node of the navigation map results in the links available from that node being displayed in the bottom left corner of the page. (The part of the screen that displays these links is easily adjustable by individual users by dragging its boundaries with the mouse.) The navigation map provides links to 14 mind maps constructed from lectures given to the philosophy of religion class. It also provides links to a moodle-hosted discussion forum with discussion threads for each topic. The text only version of the links to these resources is also available from the navigation page. A sidebar containing the list of topics included in the mind maps in a linear sequence is also included on the main page (as it is on every page).<sup>1</sup>

From the navigation page, users choose which topic they want to view the mind map for and click its name in the box on the bottom left of the screen. This activity takes them to the map of the topic. From there a range of resources can be accessed by clicking the mouse over nodes of the map and following the links that become available from that node. It is also possible to use the sidebar to change the way that the map is displayed. Users can choose to display only part of a map and concentrate their learning activities on that. They can then broaden out the view to see the section of the map they have studied in the context of the whole map for that topic.

By working through the entire site, users will acquire an understanding of the material that is both detailed and comprehensive.

## 7. Student feedback

The students were invited to respond to a questionnaire that was designed to assess the impact of the mind mapping project upon their learning for the course. The questionnaires were available on-line through moodle and were also distributed during a revision session. Of the 47 students in the class, 20 responded to the questionnaire. Their responses, along with the questions, are presented below:

### 1) Have you used the website provided by the Mind Mapping Project?

16 students reported that they had used the website. The remaining 4 reported that they had used it a little.

### 2) Have you found the Mind Mapping Project useful in your revision for the class?

16 students reported that they had found the website useful or very useful in revising for the exam. 4 said that it was not useful. Of that 4, 1 reported already using mind maps of his or her own, 1 wanted the mind maps to done at the end of the semester, and 1 reported that they did not like working on screen and had had trouble printing the maps. It is noteworthy that two of the negative responses did support the notion of the usefulness of mind mapping although perhaps not the project's maps.

### 3) Have you found the Mind Mapping Project useful for understanding the material presented in the class?

18 of the students reported that they found the mind maps either helpful or very helpful in assisting their

understanding the course material. They commented that the mind maps made the material easier to see as a coherent whole and that they were a great aid to students with little previous experience of studying philosophy. One of the students who did not say that the maps helped thought they looked useful but as of the time of the survey had not used them enough to say that they had been useful. The remaining student reported being confused by the maps. The comments in general indicated that the aim of the project to get students to think about the material synthetically was successful.

#### **4) Did you take advantage of the links to other material that the mind maps provided?**

15 of the students of the students reported that they had used the links to material outside the class material. 3 students reported that they intended to look at the outside material during the revision process and 2 reported that they had not used the outside links.

#### **5) How easy or hard did you find navigating the mind maps?**

13 students reported that the maps were easy or very easy to navigate. 4 reported that the maps were adequately easy to navigate, and 3 students reported that they found the maps hard to navigate.

#### **6) How could the mind maps be improved?**

6 students reported that the project's web site was already 'perfect', 'fine' or 'clear'. 2 students reported that they would like more detail, either in general or in some specific areas. 1 student, who had reported being confused by the mind maps in an earlier question, wanted the maps to be simplified. 2 students thought that more colour would improve the mind maps, and 1 thought that a larger font would be helpful. 1 student complained about the difficulty of printing the mind maps, which was a problem inherent in the Mind Genius software. 1 student wanted to be able to see all of the linked maps at once, which seems impossible without an enormous screen.

1 student suggested that the mind maps would be more effective if they were produced by the class. Both the teachers involved in the project have used this technique in other classes with good results. Future uses of the project's web site could incorporate this technique by using mind maps produced by students to link to the mind maps already on the web site.

#### **7) Will you use mind mapping in your own work in the future?**

12 students reported that they would definitely use mind mapping in their future work. 3 students were already using it. 3 students reported that they might use mind mapping in the future. 2 students said they would not use mind mapping in the future, one because he or she preferred lists and the other because he or she found the maps confusing. The number of students saying that they intended to use mind mapping in their future work indicates that the project's aim of providing a model for information organisation was met.

#### **8) Do you have any other comments?**

6 students made further comments. The confused student again reported confusion, which lead him to giving up using the maps. The other comments were focused upon how clear the mind maps made the structure of the course and the wish that more courses employed this technique.

We had originally intended to supplement the questionnaires by conducting interviews with the students. However, we judged that the questionnaire alone provided us with sufficient information about the students' use of the mind maps. Time constraints also played into this decision. The final examination was scheduled earlier than expected, thus cutting down the window of opportunity for conducting interviews.

## **8. Use of the web site:**

There have been 387 visitors to the site since it went live at the beginning of April. 191 of those visits occurred in the month June, well after the philosophy of religion course was over. This indicates that there has been interest in the site among people who were not involved in the class. Some of this interest was probably generated by our publicity,

the bulk of which was released in late-May and June. Some individuals have contacted us to say how useful they have found the web site. One email announced that the web site is being used in a philosophy of religion class at Oxford University. Moreover, the web site is also being used in an on-line Introduction to Philosophy class offered through the University of Colorado at Boulder, being taught by Dr Rhett Gayle (one of the project creators).

## 9. Conclusion

The core aims of the project have been achieved. The project seems to have genuinely assisted students on the philosophy of religion course to achieve the stated learning aims and intended learning outcomes. The evidence for this is in the students' responses to the questionnaire, as well as in the increase in the average grade achieved by students taking the course (see appendix A, below). In the wider context, the project team is satisfied with the quality of the web site that has been created. While certain features, such as the self-testing facility, proved too complex to implement, the web site does contain most of the core features that we had planned.

We found that what we were, and what we were not, able to achieve was to a very large extent conditioned by the software that was available. We only acquired a realistic view of the potentialities and limitations of the mind mapping software through actually using it to create a web site. In retrospect, we may well have chosen to use a different mind mapping program-one that was easier to convert to uploadable html files and that was more easily accessible to both pc and Macintosh users. An overhaul of the project's web site is envisioned that will overcome the current limitations imposed by the software package. Unfortunately, the project team did not realise some of the limitations of the Mind Genius software package until we tried exporting it into accessible html files. We also found that its ability to facilitate the on-line sharing of mind maps was very limited. On-line collaborative mind mapping by groups of students would have been a useful feature to include in the project, but was not possible with Mind Genius software.

It also became apparent to us during the course of preparing the web site that mind mapping is becoming increasingly popular within the educational environment. The range of mind mapping software available for educational purposes, as well as its versatility, has increased dramatically over the 12 months that we have been working on the philosophy of religion mind mapping project. Specifically, there are now commercially available software packages allowing web mediated collaboration that were only Beta testing when we designed our project. We intend to keep developing the project's website and to take full advantage of this developing technology.

## Appendix A: Student Assessment

The basic mode of assessment for the course was one 2500 words essay (30%) and an exam (70%). This pattern of assessment applied to the 35 philosophy honours students as well as to the 8 students from the Faculty of Education. All of the students were encouraged to use the mind maps to prepare their essays and to revise for the examination. The overall performance of the philosophy honours students was compared to that of last year's students who took the same course but did not use mind maps. The results were as follows.

In 2006, 31 philosophy honours students completed the course (that is they handed in the essay and sat the exam). Of these students 2 achieved an A, 15 achieved a B, 9 achieved a C, and 5 achieved a D.

In 2007, 31 philosophy honours students completed the course. Of these students 6 achieved an A, 15 achieved a B, 9 achieved a C, and 1 achieved an E.

The average grade in 2006 was C+, whereas the average grade in 2007 was B- (the average mark was up 1.22 on the University of Glasgow's 22 point scale in which a C grade is awarded for 12 - 14 points and a B grade for 15 - 17 points).

Curiously, the number of students achieving Bs and Cs remained constant from 2006 to 2007. However, the numbers of As awarded rose significantly while the number of students awarded a D fell significantly (to 0 in 2007). This suggests that the mind mapping project successfully assisted students to move from the B grade band to the A grade band and from the D grade band to the C grade band.

Anecdotally, we can also report that the use of the mind maps was evident in those examination papers graded by Dr Harrison. In particular, the answers of weaker students tended to display a greater than usual ability to identify correctly the scope of questions and, in answering them, to draw on a wider than usual range of relevant material.

These results indicate that the mind mapping project made a significant contribution to students' learning throughout the course. In providing students with a resource that enabled them to compare their knowledge of the key topics covered by the course with the overview of what the lecturer had identified as important, students could structure and focus their revision for the examination more effectively.

## **Appendix B: How the project has been publicised**

Since its inception the project has been publicised through a web site located among the department of philosophy's web pages. Several prominent links lead to the project's web page from the department's pages. The project's web page is also easy to access from the University of Glasgow's home page.

The project has also been publicised through the on-line philosophical community. Email announcements have directed members of the community to the project's web site.

The award was also announced in the University of Glasgow's newsletter. The Editor of the American Academy of Religion's Bulletin has been approached about including an article about the project.

The popular philosophical resources website, Episteme Links, is also advertising the project. The project's web site can be accessed through Episteme Links' philosophy of religion page and through its Eastern philosophies page.

## **Endnotes**

1. The sidebar and the text only version were incorporated into the design at a late stage to comply with the Disability and Discrimination Act (2005) requirement that web sites be accessible to all, and also to be in line with the University of Glasgow's Disability Policy (2006). Also everything on the screen, with the exception of the mind maps themselves, is re-sizeable using the zoom feature available on most internet browsers. This feature increases the accessibility of the site.