

THE PORTAL FOR POSTGRADUATES IN MEDICINE

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Abstract. To address problems identified with the postgraduate curriculum in Medicine, an interactive program using concept maps and a website was established. The portal integrates knowledge resources from medical journals and websites, slideshows and concept maps. In this article, particular focus is given to the portal's underlying information architecture. The program and website provides a constructivist learning environment.

1 Background

1.1 Context

Mastery of Medicine requires a thorough understanding of clinical and physiological topics. Postgraduates in the Medicine Department rotate through different sub-specialties during their four year course. They have to pass the College of Medicine examinations but many fail the basic sciences section. The Medicine Department created a portal with the aims of promoting meaningful learning by our postgraduate students, and facilitating their access to good quality medical resources.

1.2 What Improves Learning?

Research has highlighted three major factors that improve learning:

1. Metacognition - This refers to how students are able to set goals, choose appropriate learning strategies and monitor progress. Marzano 1998 suggests that up to 26% improvement in performance can be gained by improving students' metacognition.
2. Formative assessment - using formative assessment has a positive outcome on learning. Black and Williams 1998 suggest that using better formative assessment can produce an improvement of around 30%, which is larger than for other educational interventions.
3. The choice of assessment method - students are motivated to master what the examinations measure.

Concept maps were chosen as the cornerstone of the project because of their proven role in promoting deep or meaningful learning (González, Palencia, Umaña, et al. , 2008). Furthermore, they can be used in both formative and summative assessment. They are easy to create and their graphical nature assists iconic memory and recall.

2 Work Done

2.1 The Solution

Our solution consists of two computer servers: a Microsoft Internet Information Server and an IHMC Concept Map Server (Institute for Human and Machine Cognition, 2010). Both servers are integrated into a single portal using DotNetNuke (DotNetNuke Content Management Platform, 2010). The portal is available on the university intranet and global Internet (<http://sumed.sun.ac.za>).

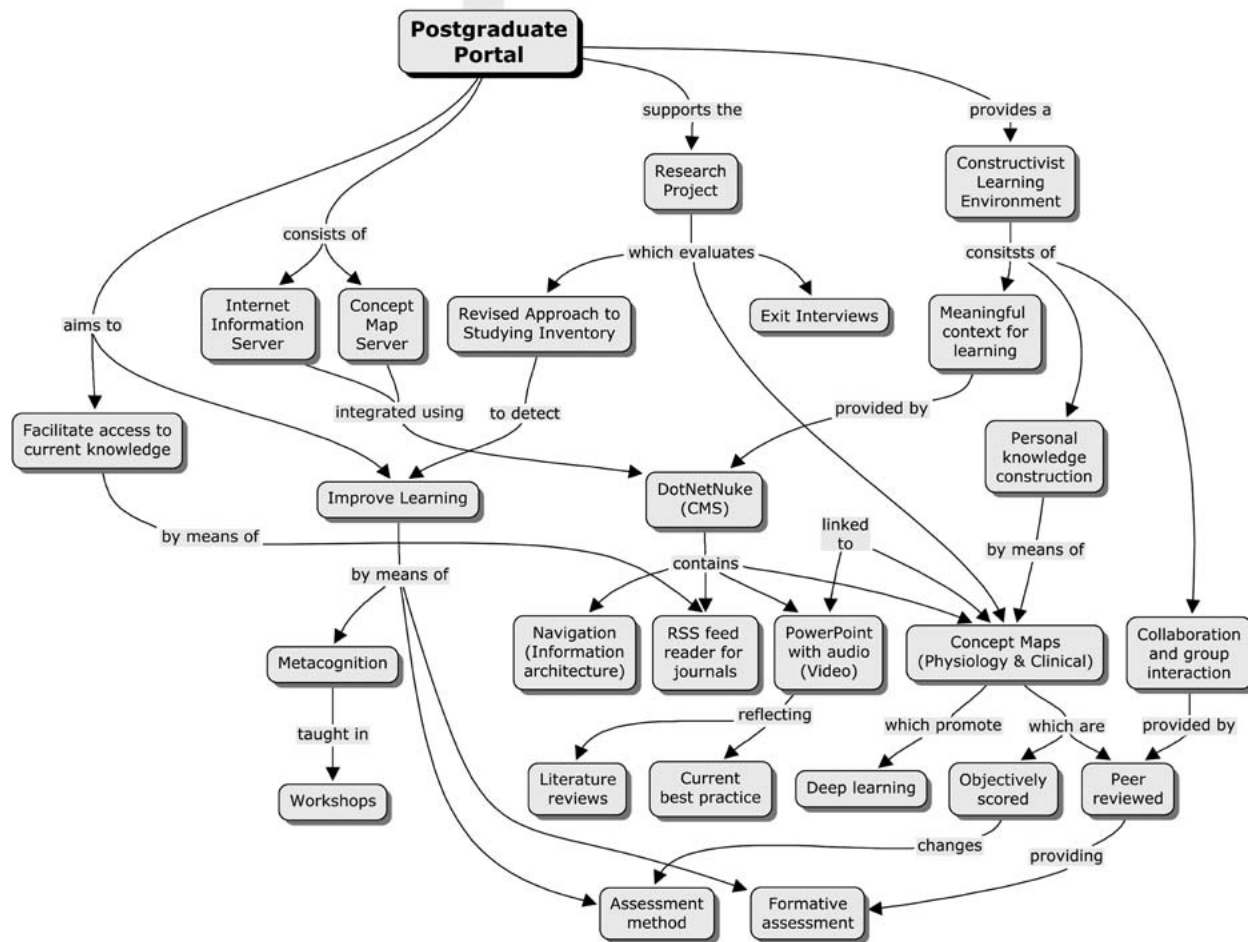


Figure 1. Concept map of the Postgraduate Portal

The portal has a number of videos and articles to which student can refer to assist them with concept mapping. It also provides access to concept maps using both organ system and examination hierarchies. The concept maps are indexed and made available on the portal using iframes. Indexing the concept maps involves exporting the propositions, extracting unique applicable words using a Word macro, and using this list as the key words for the iframe (which DotNetNuke automatically indexes).

There are also numerous carefully selected links to other websites and resources, as well as videos that support the content of the Medicine course on the portal. These are arranged by organ system and indexed using the DotNetNuke's taxonomy feature. A RSS feed reader aggregates information from more than 30 core medical journals. Students can subscribe to the journals that interest them and get notified of updates via email.

2.2 Concept Maps, Cognition and Evaluation

Every three months a new batch of postgraduates participates in a workshop. They are taught how to use CmapTools for creating concept maps and given some simple metacognitive techniques on repetition (University of Waterloo). They agree to do two concept maps per month and present these to their peers monthly for formative assessment. The students do a Revised Approaches to Studying Inventory (RASI) (Mattick, Dennis & Blight, 2004) at the beginning and end of the three months, and there is an exit interview at the end with another RASI test. All comments at the exit interview are recorded and will be thematically analysed. Anonymity is assured. We are interested to see if the RASI scores change significantly during the intervention.

After each formative assessment, the postgraduates make the changes to their concept maps suggested by their peers and these are submitted for publication on the portal. Each concept map is indexed (as described above) and also objectively scored using the following objective criteria:

Item	Score
Propositions	1 point per valid proposition
Links (In and Out) from Concepts	1 point per valid link
Hierarchy	5 points per level
Cross Links	10 points per link
Focus question	10 points or zero
Resources	1 point per resource link

Table 1. Scoring Concept Maps Objectively

There are numerous ways to score concept maps by allocating different weighting factors to the various components (West, Park, Pomeroy & Sandoval, 2002; Taricani & Clariana, 2006).

2.3 *Constructivist Learning Environment*

The program provides our postgraduates with the three Cs of a constructivist learning environment: a meaningful and authentic context for learning; the tools, support, time and space for personal knowledge construction; and support for collaboration and group reflection and production (Jonassen, 1995; Lefoe, 1998).

2.4 *Information Architecture*

Information that is not accessible might as well not exist as it is useless unless it can be found. Information architecture is the categorization of information into a coherent structure, preferably one that the users can understand quickly, if not inherently. It's usually hierarchical, but can have other structures, such as concentric or even chaotic (Wikipedia). Special attention was provided to the site's information architecture in order to facilitate access to information on the portal by the users. This was done by using:

- Simple word searching across all website pages (a feature of DotNetNuke).
- Taxonomy - (a feature of DotNetNuke v05.04.00 and later). All content is indexed according to the taxonomy used by the College of Physicians of South Africa when describing their curriculum. This aids postgraduates in finding material directly relevant to their studies as the College sets all examinations.
- Index of page titles.
- Sitemap – presenting the site structure as a collapsible tree.
- Tag cloud. This provides an alphabetic list of the common words on the website with hyperlinks to facilitate content retrieval.
- Menu structure. The website's content is organized both according to the College curriculum and organ systems which are widely used in Internal Medicine.
- Extensive use is made of concept maps to provide site navigation and to convey the meaning of the different sections of the site.

We intend to do usability testing at a future date and further refine the website according to our findings.

3 **Preliminary Feedback**

We will complete the research project during 2011 and hope to publish the findings. Some of the comments by the postgraduates so far:

“I find that the main contribution of learning is actually in the creation of the concept map.”

“The concept maps that were presented in our meetings were easy to follow; they helped me to understand and refresh things on topics, and learn new things as well.”

4 Conclusions

Maintaining a portal where concept maps and other resources are continually being added, cross referenced and indexed is extremely time-consuming. It also requires a thorough working knowledge of servers, databases, software and usability issues. Ultimately the value of concept maps for studying and the role played by the portal will be decided by the postgraduates. We eagerly await the results of the research project.

5 Acknowledgements

This research project was supported by funding from the Department of Education (South Africa) and the Fund for Innovation in Learning and Teaching (Stellenbosch University). Assisting with various aspects of the research: Professor Ben van Heerden and Ms Martie van Heusden.

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