

## Development of Multimedia Modules for Student-Centered Learning

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### Introduction

Over the last decade computer technology has developed significantly to enable a personal computer (PC) to be used not only for scientific calculations and data analysis, but also an important and useful tool for use in the teaching and learning environment. A multimedia PC is able to combine text, audio, graphics, video and animation, and presenting these elements in a meaningful way to the computer screen. Currently the interests of instructional designer and educators have shifted to the use of multimedia as another mode of information delivery. We explore, study and develop multimedia based teaching-learning modules in Physics for use by students at the upper secondary and first year university undergraduates. Initial focus of the module would be on the subject of heat and temperature.

### Materials and Methods

We have adopted that an appropriate and exciting learning module should contain not only relevant and accurate contents but has to follow a well defined, focused sequence of learning steps, apart from the inclusion of engaging audio and animation/video clips. The user interface and overall

instructional design is studied and tested to give maximum impact on the teaching and understanding of the concepts. Authoring software, graphics editors and audio/video capturing program were used during the development stage.

### Results and Discussion

The finished module, prepared in a CD-ROM version, contains topics on temperature and thermal equilibrium, thermometers and temperature scales, quantity of heat, calorimeter, specific heat determination and concepts on phase change. Apart from the standard text and/or audio mode of contents presentation, we have included 'virtual experiment' type of activity where learning and understanding would be achieved through exploratory and simulation exercises.

### Conclusions

This work is completed and two prototype modules on Heat and Temperature, and Mechanics have been developed.

### Benefits from the study

Computer based teaching and learning module with the following characteristics; multimedia interactive that pro-

mote and enhance the teaching and learning process in the physics subject.

**Literature cited in the text**  
None.

### Project Publications in Refereed Journals

Bennet, S.J. and Brennan, M.J. 1996. Interactive Multimedia Learning in Physics. *Aust. J. Edu. Technology*. 12(1): 8-17.

### Project Publications in Conference Proceedings

Ian, J., Mary, P. and Anne, F. 1999. Teaching and Learning with Multimedia: Is it Worth the Trouble? *AsPEN Conf. Univ. Physics Edu. For the 21<sup>st</sup>. Century*, Shah Alam. Pp.78-87.

Zaidan Abdul Wahab, Zainal Abidin Sulaiman, Habibah A. Jalil and Sim Lim Hai. 2000. Simulasi dan Modulo Multimedia: Satu Tinjauan Tentang Pembinaan dan Penggunaannya Dalam Pengajaran dan Pembelajaran Fizik. *AsPEN Conf. Pendekatan Bestari dalam Pendidikan Fizik*, UPSI, Tanjung Malim 28-31 Mac 2000.

### Graduate Research

Habibah Abdul Jalil. 2001. Physics Multimedia [M.Sc]. Universiti Putra Malaysia.