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COMPUTER ASSISTED LEARNING IS AN EFFECTIVE WAY OF TEACHING AND LEARNING IN MEDICAL EDUCATION

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Aims and Objectives

- To define computer assisted learning as the teaching and learning tool and environments facilitated through computers
- To assess the effectiveness of teaching and learning by using computer assisted learning programme in medical education
- To provide teachers with various teaching information when teaching medical students.

Methods

- **Systematic review of published materials obtained from four large online databases, namely EMBASE, Blackwell Synergy, MEDLINE, and the *Cochrane Library* database**
- **Personal reflection on recent changes in computer assisted learning in medical education and demonstrates that the use of computer assisted learning programme is effective and easy to use.**
- **Supplemented by email discussions with colleagues based in the United Kingdom.**

Results

- Computer assisted instruction enhances learning, allowing the student to decide content, time, place and pace of instruction.
- Evaluation of CAL as an intervention is difficult, involving impact assessment studies of a variety of combined initiatives which seek to influence large and diverse populations. [1]
- CAL provided the medical students with a popular and effective way of learning. Computer assisted learning systems' development in medical education

- **It would be concentrated on the following areas in the future years:**

  - **Increasing systems' performances:** This includes higher speed of processing capacity and stronger computer software. This is a normal continuance to current computer assisted learning systems and their development's policy. [2, 3]

  - **More distributed systems:** Nowadays modern world wide networks and high speed digital and mobile communications create a strong context for design and implementation of more distributed computer assisted learning systems. In the near future teleconferencing and non-centralised classrooms will be usual. [2]

  - **Simulation and virtual reality:** New technology allows us to create 3 dimensional near-toreal environments for simulator systems. In practice, current applications of such systems are only on flight or sailing training systems. However, in the near future they will have a more important role, especially for blind and nearly blind people's education. [3]

Table 1: Comparison between CAL and Traditional Teaching Methods in Medical Education

Tradition Model	Alternative Model	CAL Implications
Classroom lectures	Individual exploration	Networked PCs with access to information
Passive absorption	Apprenticeship	Requires skills development and simulations
Individual work	Team learning	Benefits from collaborative tools and e-mail
Omniscient work	Teacher as guide	Relies on access to experts over the network
Stable content	Fast changing content	Requires networks and publishing tools
Homogeneity	Diversity	Requires a variety of access tools and methods

RECENT PROGRESS AND ADVANCES

These are outlined CAL in medical education below:

- **The quantity of applied research design and production of CAL application in medical field is growing rapidly and the quality is improving**
- **There is good evidence supporting the use of CAL in medical education lowering all costs related to production and use**
- **Guidelines and consensus statements issued by conventional medical organisations have recommended CAL application in medical education**
- **CAL is increasingly practised in comparison of conventional teaching settings**
- **There is a more open attitude to CAL application in medical education among conventional health professionals; this is partly explained by the rise of problem-based learning (PBL) environment**

Discussion (1)

- The quantity of applied research design and production of computer assisted learning application in medical field is growing rapidly and the quality is improving.
- There is good evidence supporting the use of computer assisted learning in medical education lowering all costs related to production and use.
- Development of guidelines and consensus statements issued by conventional medical organisations have recommended computer assisted learning application in medical education.[1]

Figure 1: Details of Educational Institutions, which Offer Courses on CAL

- **Association for the Advancement of Computing in Education** The purpose of the AACE is to encourage scholarly inquiry related to information technology in education and the dissemination of research results and their applications through Publications, Conferences, Divisions/Societies/Chapters and Inter-Organizational Projects.
- **Support Initiative for Multimedia Applications (SIMA)** The Support Initiative for Multimedia Applications (SIMA) was funded by the JISC New Technologies Initiative through the Advisory Group on Computer Graphics (AGOCG). The initiative funded projects in a range of areas, demonstrating the use of new technology to the higher education community through example, setting up services, training, and dissemination of good practice.
- **Computers in Teaching Initiative (CTI)** The CTI (Computers in Teaching Initiative) comprises 24 subject-based centres working to encourage the use of learning technologies in UK higher education. The CTI Support Service, based at the University of Oxford, coordinates the work of the centres, and acts as a focal point for activities relating to the use of communications and information technology in university teaching.
- **Advisory Group on Computer Graphics (AGOCG)** The Advisory Group on Computer Graphics (AGOCG) is an initiative of the Joint Information System Committee (JISC) of the Higher Education Funding Councils and the Research Councils. AGOCG provides a single national focus for computer graphics, visualization, multimedia and virtual environments within the UK higher education community and is concerned with the handling and processing visual information in all its forms.
- **The British Computer Society** The Society is concerned with the development of computing and its effective application. Under its Royal Charter granted in 1984, it also has responsibilities for education and training, for public awareness, and above all for standards, quality and professionalism.
- **Computer Assisted Teaching and Learning: The CASTLE Project** "Providing freely available tools for creating on-line multi-media assessments quickly and easily. Requires no prior knowledge of HTML, CGI or other scripting or mark-up language".
- **Institute for Computer Based Learning** The Institutes overall objectives are to pursue research in computer-based learning and its impact on teaching and training; to develop computer based learning environments for use in teaching and training and to promote the transfer of technology-based training to industry and commerce.
- **Educational Technology Information and Resources** Edu-Tech is also growing in its sections for authoring resources, to aid awareness and use of multimedia/hypertext authoring software (such as ToolBook), HTML- the language for authoring WWW pages, and computer-assisted assessment.
- **Centre for Gastroenterology** Royal Free Hospital, the creation and implementation of a Computer-aided Learning platform called RadioVision, which is accessible by students using their home-based PC or suitable equipped university computers.
- **Epidemiology and Education Unit** Centre for Adult and Paediatric Gastroenterology, Barts and The London, Queen Mary’s School of Medicine and Dentistry, Queen Mary, University of London

Discussion (2)

- Computer assisted learning is increasingly practised in comparison of conventional teaching settings.

- Furthermore, the computer assisted learning should be seen as complementary to other traditional contact teaching, which may be more suited to clinical skills and attitudes.

Conclusion

- Computer assisted learning is an effective way of increasing knowledge in teaching medical students in medical education.
- The potential is vast and its principles, application and practices need to be explored in detail.
- More sophisticated software with virtual medical education who can communicate and interact with the medical students in a very realistic way in the future.
- Be used more as a supplement and for self-directed studies.

References

- [1] Guo L, Osonnaya K, Abdi M. and Osonnaya C. Information Technology in Medical Education and Practice: An Interactive Workshop. Association of Health Care Professionals 17th Annual Scientific Conference, London, UK, August 2006.
- [2] Osonnaya C. and Osonnaya K. New Technology in Medical Education, International Journal of Medicine 2003; 4: 239-284
- [3] Lancioni G. E., O'Reilly M. F., Seedhouse P., Furniss F., and Cunha B. Promoting Independent Task Performance by Persons with Severe Developmental Disabilities through a New Computer Aided System. Behav Modif 2000; 24: 700 - 718