Beat: Technology

Information and Communication Technology impacts on Environmental Education

Sustainable Developments of EU and USA

London, 28.08.2022, 21:09 Time

USPA NEWS - Environmental education plays an impact role in Europe and North America's sustainable development. Traditional teaching methods are centred on teachers and usually result in a general lack of interest for students to learn. Computers are an ideal tool for environmental education. Many universities attempted to use multimedia learning environments instead of the traditional face-to-face teaching method. Online education using web-based technologies is growing in higher and non-professional environmental education. More and more computers will be used in Environmental education in European and North American societies outside of traditional educational settings in the long run. European and North American economy has grown steadily, however, the traditional development patterns characterized by highenergy consumption and severe pollution result in serious environmental pollution and ecological disruption, and they restrict European and North American's ability to achieve sustainable development[1−2].

I. INTRODUCTION

Environmental education (EE) has been placed at the centre of efforts to achieve sustainable development for the last several decades. It is known for the underlying concept that humans are part of nature. The ultimate purpose of environmental education is to help individuals develop conscious behaviours toward the environment so that they may build a long-term location[3]. With this aim, the number of studies on environmental education is increasing rapidly in Europe and North America. Although environmental education(EE) heavily depends on direct experiences of natural phenomena outside the classroom, many environmental educators have begun to use computers in environmental education in recent years. Application of computers in environmental education has the prospect of extending the realm of computer-mediated education to learning situations outside of traditional educational settings[4].

II. ENVIRONMENTAL EDUCATION AND COMPUTER-BASED- TRAINING

In the standard lecture-style class, students do not always ask questions throughout the class. This may be due to several factors: inability to clearly express the question; disinterest in the topic; shyness in large groups; uncertainty as to the appropriateness of the question, etc. Additionally, the instructor may not encourage many questions throughout the class due to time constraints. The application of computers in EE is of great importance. Many universities are planning on broadening their current student clientele to include degrees, courses, certifications and training all made available and customized through information technology. They attempted to use multimedia learning environments instead of traditional face-to-face clear teaching to improve student learning experiences. The most widely used teaching aids are the delivery of material through download from course Web sites, communication tools such as group email and forums, and the use of multiple forms of media. Following are some examples of computer applications in Environmental Education.

III. THE ICT AND APPLICATIONS TO HIGHER EDUCATION IN UNIVERSITIES

Higher education in Europe and North America is provided in two kinds of educational institutions: universities, and colleges. In higher education, various environmental courses for undergraduates are provided. The universities often make every effort in providing EE to the students. Teachers of colleges also try to incorporate environmental elements in their courses. Classroom teaching methods frequently centre on teachers writing information on a chalkboard and requiring students to copy it into their notebooks for later memorization; alternately, they may read aloud and ask students to repeat the recitation. Student boredom with such teaching methods is often cited as a reason for misbehaviour and a general lack of interest in studying, particularly within adolescent age groups. Educators with an interest in promoting social values through environmental education see this kind of pedagogical orientation as particularly troubling, and in some cases even counter to the central goals of programs.

Ministry of Education in Europe and also in North America encourages teachers to use more innovative teaching methods, and many creative teachers are working in the country. Computers are powerful devices which have been used in many processes to collect, store, process, and analyze data. The large variety of functions that can be handled simply and efficiently has made the computer an ideally suited tool for EE. Online education and the level of interest of institutions in the use of Web-based technologies to enhance the learning experience are growing. The web-based technologies typically aim at enhancing the learning experience of the student for environment content. Combinations of different communication and course management tools and different forms of media can be used to provide students with a range of multimedia learning environments.

One of the key characteristics of Web-based learning resources is their capacity to integrate diverse media such as text, picture, audio, animation and video to create highly visualized instructional materials, hence promoting the reading interests and willingness of the learner. Interactivity is the greatest advantage that multimedia and visualization contribute to teaching and learning. With simultaneous visual and verbal explanations, learners are more likely to assimilate content when alternating visual and verbal information is presented in short rather than long segments.
Also, mathematical modelling and simulation are advanced methods which have become popular in recent years. They are used for the design of treatment processes and evaluations of transport and transformation phenomena of various pollutants in natural environments such as air, rivers and groundwater[5–6]. They can also serve as powerful tutorial tools in environmental engineering programs for problems that have various levels of complexity.

Learning by simulation is very effective since the students have the chance to simply test the effects of various parameters on natural and manmade processes. Several simulation and data analysis programs have been used in environmental engineering education and practice. Because of their simplicity and versatility, they can serve as a starting educational tool to encourage further study, use and development of more sophisticated computer programs in environmental engineering and related fields[7].
Several top-ranked universities in Europe and North America have adopted a systematic approach to making EE learning more accessible and engaging while applying theoretical ideas to the challenge of learning and teaching. Such universities conducted a student-centred learning model resulting in a sustainable online instructional framework for students and instructors.

IV. THE INTERNET-BASED EDUCATION AND ITS IMPACTS ON NON-PROFESSIONAL EDUCATORS

Currently, many more Universities in Europe and North America are engaging in training, research and community development, maintaining their orientation towards balancing socio-economic development and environmental conservation. They provide courses on environmental impact assessment of development projects for university staff members, government officials, corporate employees, and activists. Certainly, the existence of so many and so varied approaches to environmental learning address a wide range of issues-offer multiple opportunities for young people and adults to learn about and engage with environmental issues in their communities and within wider national discussions. Public awareness of environmental pollution problems has also contributed to the recognition that environmental quality control deserves the same computerization efforts as those applied in environmental education. The impact of a mobile guide system on different parameters of environmental literacy in comparison to traditional instruments of environmental education was researched and studied thoroughly[8].

The computer as a mobile guide can lead to an increase in environmental knowledge and in the case of the children it can increase their motivation to engage in environmental education activities.
The results of the study show that, even at this early stage of development, mobile-centred guide systems can achieve similar effects as traditional interpretive media concerning influencing environmental literacy. Environmental education institutions could benefit especially from the motivational effect of mobile nature guides to encourage the participation of children in activities involving direct experiences of nature. Future mobile nature guides could lead their motivational functionality to further enhance the environmental learning experience of a wide variety of target groups. This also implies that internet-based environmental learning media could be used to make the direct experience of natural environments also accessible to people with disabilities. Remarkable technological advances have enabled us to develop access to high-quality online courses that visualize the Earth's environment in a simple-to-access, easy-to-understand way.

There is a growing trend in the use of online courses for teaching and learning all around the world. This trend recognizes that the internet and world wide web provide powerful new education and information-delivery capabilities which can be used to achieve diverse educational goals. Online education enables institutions to reach new learners at a distance, increase convenience, and expand educational opportunities, especially in nonprofessional environmental education. There are many efforts to develop courses for nonprofessional environmental education purposes. Examples of these include a free resource that supports teaching and learning about the planet earth's environment and illuminates key concepts in a prospective approach and format. Each of these helps the public easily understand the planet earth's environment in a visualized and illustrated way. Online courses have become an integral component of environmental science education and will continue to grow over the coming decades.

V. CONCLUSIONS

In the final summarization, the condition of European and North American water resources is adequate but the atmospheric environment is being severely polluted, solid waste pollution and noise pollution are increasing, and the ecological environment is degenerating rapidly as a result of reduced
biodiversity. Traditional Environmental Education frequently centred on teachers and ignored students, which may lead to misbehaviour and a general lack of interest in studying. Computers can serve as an effective instrument in environmental education

not only in higher education but also in nonprofessional education. The application of computers in environmental education has increased communication among different people, and increased social learning within a distance course requires creative and innovative approaches in the field of Environmental Education and sustainable developments.

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Article online:
https://www.uspa24.com/bericht-21509/information-and-communication-technology-impacts-on-environmental-education.html

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