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RECENT ADVANCES IN DENTAL EDUCATION

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Abstract

Dentistry is a branch of medicine that deals with the study, diagnosis, prevention and treatment of various disorders of the oral and maxillofacial region. Aspiring dentists educate themselves in a four-year course in a dental school wherein after completion, the individual receives a degree in dentistry, dental surgery or dental medicine depending upon the program offered. Education is a process of knowledge and awareness and must include both theoretical and practical knowledge to have a holistic education. With the varied changes in technology, biology and increasing research in medicine, there has also been considerable reformations in dental education as opposed to earlier times. This enhances the skills of the dental students in order to render proper service to the patients. However, the present reformations are unable to provide a long-lasting education and many of the reformations are still in the infant stage. A reformation is hence required to provide a long term learning experience and to inculcate an inquiring, proficient mind in the dental student. For instilling such characteristics in a student, timely changes in the curriculum is a necessity. The usage of technology such as VR and the addition of other advancements such as stimulation or case based learning, prepares them to face a variety of cases and helps them in providing proper care to the patients. This article explores the various advancements that can be added into the curriculum and the advantages as well as disadvantages of the same. Medicine is a course where the individual is always a student, hence a long term knowledge is a necessity to provide holistic care for the patient.

KEYWORDS: *Dental Education- Advancements; Virtual Reality; Community/case based learning; stimulation; technology; patient care; dental student*

I. Introduction

Dental Practice is an important part in the human health service and it is occurring at a high rate in today's day and age. Dental and oro-facial health is similar to other human health services and is of great importance as dental health determines the overall body health at times [1]. A dental school is a school of tertiary education, in which prospective students are admitted, taught dental medicine so as to receive a degree in dentistry, dental surgery or dental medicine that varies accordingly to the various countries that dentistry is taught. Based on the new revolutionary era, with varied changes in nanotechnology and biology, the primary dental education has undergone a shift- reshaped and reformed by the introduction of the various trends and practices so as to enhance the skills of the dental students. This enables them to render proper services to their patients [2]. These changes and trends are a dire requirement as the available current education system in the developing and under developed countries lag behind the revolutionary era. The available trends in dental schools are unable to provide a good beneficial, long-lasting education on the students who are therefore unable to provide the patient with proper care. Case-related studies and education, stimulation based learning, self learning are still at its infant stage and are somewhat neglected by the dental professional organisation [2].

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An important part of education is research. It helps in contributing knowledge and is one of the many stepping stones in education. It also helps to raise public awareness and nourishes the brain, with an increased knowledge in the subject. Some of the notable work include- determination of correlation between width of anterior maxillary teeth using intraoral and extraoral factors [3], periodontal health status when wearing temporary partial dentures [4], evaluation of microgap at implant-abutment interface [5], fifth generation cephalosporin efficiency against MRSA [6], marginal discrepancy in all ceramic crowns influenced by resin bonded luting cement [7], aloe vera on oral health [8], SEM analysis of marginal discrepancy in cervical and incisal margin in cement veneering material [9], cellulitis management [10], meta analysis on surface loosening in implant due to coated surfaces [11], all ceramic restoration-rural population awareness [12], clinical report for acromegaly patient using lip bumper prosthesis [13], magnetically retained silicone facial prosthesis [14], use of impregnated retraction cords on gingiva [15], hygiene of the oral cavity in pregnant women [16] and in vitro study on surface modifiers used in retention of cement-retained implant [17].

Considering all the requirements for the employment of the current trends and practices in dental education, this article strives to review the various trends used by dental schools of other countries and to analyse the advantages and disadvantages of dental education with advancements [18].

PROBLEMS WITH THE CURRENT DENTAL EDUCATION SYSTEM:

There is an increased demand of proper oral hygiene all over the world as it has a significant impact on the systemic health of the individual. India has over 290 dental schools, producing more than 25000 dental (BDS) graduates per year. Although a significantly large number of dental graduates are present, the Indian Dental Education has a ‘challenge’ to maintain professionalism due to the rigorous pressure that it applies on the education [19].

India is a developing country boasting more than one billion people and has a spur of professional courses over the past few years. Though there are a number of dental colleges in the country, there is a significant lack of standardisation and the employment of various advances to cope with the revolutionary era and to ease out the rigorous education system [20,21]. A reformation in the current education system is necessary for a long term learning experience, develop intellectual responses, better communication with fellow dentists and patients and to inculcate an inquiring mind that strives to analyse, learn and appreciate the various developments present [22].

EFFECTIVENESS OF COMPUTER AIDED, SELF-INSTRUCTIONAL PROGRAMS:

Computer-aided, self-instructional program provides an accessible and flexible method of learning at the ‘ease’ of the student [23]. A review article, pointed out that the employment of self-instructional programs would improve cognitive skills of the individual over a short duration of time [24].

Computer aided programs provide an interactive method of learning while making use of presentations. This enhances the normal teaching by providing the student with an opportunity to learn at their own pace [23]. This method of learning greatly increases the students’ interest in the subject and is a suitable vehicle to instill knowledge in them that lasts for a lifetime [25,26].

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This being said, students showed varied responses to learning based on computer and self-instructional programs where some say it is extremely efficient and others as little to no efficiency when compared to conventional programs. Although this method of education is innovative and interactive, providing students an opportunity to educate themselves for a lifetime. Although this method of education is useful, it can be used to its full potential only when the student has the least amount of distraction, is alert and has interest to learn. Hence, it may not be useful to all students [23].

INFLUENCE OF 'NEW SCIENCE' ON DENTAL EDUCATION:

In the era of technologies and revolution, employment of computer sciences and information sciences is noteworthy. Employment of stimulation laboratories hone the pre-clinical skills of the student, helping them in better analysis of the problem in the patient [27,28].

Significant changes in the curriculum is highly necessary for the generation of knowledge and to facilitate quick responsiveness to the student. Incorporation of stimulation, usage of virtual reality and employment of various new technology or innovation provides the students with greater learning experiences and evidence-based education [29] that improves the students' attitude towards learning [18].

This being said, one disadvantage in this establishment is the need of infrastructure and sufficient knowledge for the teachers to inculcate a broad curriculum into the rigorous education to address current issues and to bring about a reformation in the same [30].

PUZZLE BASED LEARNING IN DENTAL EDUCATION:

Puzzle based teaching model has existed for over 60 years but the education system has seen new developments in problem-based, projection based and puzzle based learning approaches [31]. Problem/ puzzle based learning method strives to educate students of the clinical concepts through solving clinical problems. This makes the learning experience more interactive and draws a quick response of the student when dealt with the same condition clinically [32,33]. A problem with puzzle based learning is the students' question on the learning method itself and the involvement in the same [33,34].

EMPLOYMENT OF VR(VIRTUAL REALITY) IN DENTAL EDUCATION:

Clinical dentistry is the most challenging and demanding area of dentistry and it is highly necessary for the student to develop skills for the same for acquisition of clinical knowledge and treatment of patients with care [35]. Addressing these issues comes with the usage of technology-based learning by students. Some important technologies include medical stimulation, virtual reality techniques [35,36].

The use of virtual and augmented reality helps in application of theoretical knowledge in clinical practice, proper use of instruments, correct ergonomic positioning, improvement in the psychomotor skills, increased speed in acquisition of skills [37], self evaluation of the work performed [38,39]. A few disadvantages of virtual reality employment are difficulty in acquisition of the instrument, inexperience in handling, cost of establishing the service [40,41]. Nonetheless, the availability of virtual reality offers faster and more effective treatment to patients rendered by the students and is a definite innovation employment in the growing time and age [35,41].

INTRODUCTION OF COMMUNICATION SKILLS COURSE:

Community is an essential tool required in clinical practise and also for team building and is an essential part of dental education [19]. Introduction of communication skills in dental courses can input information such as handling of patients with empathy, ethical awareness as it is crucial in building a rapport between dentist and patient [42]. This can establish trust and thus helps the patient to handle treatment with full cooperation [42,43].

II. CONCLUSION:

Education is a process of knowledge and awareness of the concepts and utilisation of the same in daily life. Education must include both theoretical and practical knowledge and importance to both is a necessity for long-term knowledge. A dentist 'of the future' should be a competent professional, showcasing skills for appropriate treatment and must also establish themselves as a competent leader, critical thinker and diagnostician. For inculcating such characteristics, it is important to add timely changes to the current dental education programme which may be monotonous and rigorous. Usage of technology and addition of newer developments and advancements can go a long way in honing the skills of the dental student thereby making them more prepared to deal with a variety of cases, rendering proper care for patients and provision of a long term of learning for the student itself.

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