



Competency Based Dental Education - A Narrative Review

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Abstract

A graduate of dentistry, fresh from the university, should be able to function independently if he/she is competent enough. The graduate should have acquired knowledge, skills, values and professionalism to face the patients reporting to the clinic and offer solutions to the problems the patient has. Theoretical knowledge may not ensure competence especially in skills unless the training is so tuned. Society requires the services of a dentist who is knowledgeable, skilful and has an attitude and value system. In competency based education (CBE) the teaching and assessment methods are subjected to modifications in the application level, though the basic elements remain unchanged. CBE is introduced to the Indian scene of dental education only very recently and the pros and cons are under intensive discussion.

Keywords: Competency Based Dental Education (CBDE); Flipped Class Rooms; Scaffolding; Objectives; Competencies; Outcome Based Education; Stages Towards Mastery

Introduction

Competency based dental education (CBDE) has become a very popular phraseology in the educational circles with the turn of the twenty first century. Competence is the ability to perform tasks and roles to the expected standard. Capability and expertise are two popular synonyms that indicate the ability to do something well. When we speak about a senior specialist, the statement usually made is 'his/her competence as a dental specialist is unquestionable'. Before the formal educational system was started, training related to dentistry was initiated through apprenticeship. Youngsters who were interested to adopt dental practice as a means of livelihood would join a senior practitioner as an apprentice and will continue as his assistant for a specified period of time. Once satisfied with the skills acquired, the senior practitioner would

certify the standards and the apprentice would receive registration from the concerned authorities and he can practise in a specified area. When dental colleges were started, qualified graduates have come to the scene. In those days no one has raised the question as to what do they know or are they competent to be dentist.

Ralph Tyler

In 1949, Ralph Tyler, an educational psychologist, raised a few pertinent questions in a publication of the Chicago University, addressing educational institutions: 1. What are the purposes a school should seek to attain? 2. What are the educational experiences that are provided to attain the purposes? 3. How are these experiences designed or organised? 4. How will one determine whether these purposes are attained/achieved? [1] Tyler has given emphasis to

the outcome of training and it can be considered as a pathbreaking stance. Tyler's statements were later known as 'Tyler rationale'.

Many educationists have built upon the ideas of Tyler and the most significant contributor was Benjamin Bloom who has formulated the taxonomy of educational objectives [2,3]. From that time onwards, before starting an educational programme, specific goals were set under the domains of knowledge, skills and attitude (Fig Obj). At the end of the training period assessment was done to find out whether the goals were achieved. If those were achieved, it was generally considered that the outcome of the course was successful. With the traditional method of education, however the mastery obtained by the student could not be ascertained. In spite of imparting similar training, the outcome varies between students; to be precise the student's aptitude. Aptitude divergence and variability in learning performance amongst students has been explained by Carroll in the context of school children. Carroll observed that each student requires his own learning time to achieve the learning goal. This has led to personalized system of instruction to improve the outcome in many students. In short, each teacher should allow adequate learning time based on individual aptitude [4]. The beginning of competency based learning was palpably visible with this finding.

Towards mastery

It is generally believed that to become an expert in any profession, it requires ten years of intense practice. Through the best-selling book 'Outliers- the story of success' the author Malcom Gladwell popularised the 10000-hour rule which states "you need 10000 hours of deliberate practice to achieve mastery in a particular skill" [5].

Mastery development happens in five stages: 1. Novice, 2. Beginner, 3. Competent, 4. Proficiency and 5. Mastery or expertise.

- **Novice:** Novice has just joined the training programme and has no previous experience. Novice cannot take his/her own decisions and is heavily dependent on the faculty. They follow the rules of the institution or the teacher. Usually in the first two years of the course, students remain as novices.
- **Beginner:** From the third year to the end of internship can be considered as the stage of beginner. They are still dependent on the teacher in decision making and once an ideal situation in which they are familiar comes across they may perform with confidence. But when the context changes, they find it difficult to perform. Beginners are faster and more accurate than novices in their skills and decisions.

- **Competent:** In this third stage, a professional can do independent practice. They are more independent and can manage most of the clinical situations effectively and professionally because they have acquired the skills and internalised the standards of performance.
- **Proficiency:** This is the next level of professional growth and the professional reassesses the scope and limitations of his practising field. He ventures into experimenting with the recent developments of the profession and can adapt his skills to face challenging situations.
- **Mastery or expertise:** A professional reaches this stage only after many years of practice. He will start contributing towards the profession by way of new knowledge and skills and will share with others through scientific articles and by conducting training programmes. The professional undergoes a reinvention process through many phases to reach the mastery stage. This categorisation of professional expertise was given by Chambers D W and it can be considered as the initiating attempt towards CBE [6].

Objective, outcome, competency

These terms are closely related to each other. Objective is a statement that indicates a goal towards which the students are lead after imparting adequate training. Advocates of competency-based education (CBE) would state that objective is a broad statement. Bloom has stated in his classic article that there are three categories of learning objectives viz. institutional, intermediate (departmental) and specific.

- "At the end of the BDS course, the student should be able to diagnose and manage oral diseases that occur frequently in the community". This is an institutional objective pertaining to all the graduates who are passed out from a dental college. Naturally it will be broad based. Community based obligations are highlighted in this objective.
- "At the end of the learning period, the student should be able to screen patients, identify partially edentulous situations and decide appropriate treatment". This objective statement is more focused and the student should be knowledgeable about the classification of partially edentulous situations (Kennedy's classification) and about the design of removable partial dentures. The student should suggest the need for a partial denture and other options. The student should know how to perform clinical examination and select the instruments required. The elements of required competencies are included in this objective statement. This is relevant to the department of prosthodontics and hence termed as departmental objective. The competency elements are underlined.

- “At the end of the clinical posting, the student should be able to give inferior alveolar block anaesthesia and demonstrate the effect of anaesthesia by eliciting signs and symptoms”. This objective statement is very precise and clear and about a relevant and essential skill required for the dental practice. The skill is observable and measurable. When the trainee does this skill, a teacher can easily evaluate with the aid of pre-determined rating scales. The outcome of the training and the acquired competency can be measured not only by an evaluator but by the trainee also. This type of specific learning objective has qualities of an outcome and a competency statement [7,8].

Competencies for European dentists

A few generalised competency statements required for graduating European dentists are given below:

- “Upon graduation a dentist should be competent to communicate effectively, interactively and reflectively with patients, their families, relatives, carers and with other health professionals involved in their care, irrespective of age, social and cultural background”.
- “Upon graduation a dentist should demonstrate ability to maintain knowledge and understanding throughout a professional life. A dentist must demonstrate an appropriate information literacy to acquire and use information in a critical, scientific and effective manner”.
- “Upon graduation a dentist should be competent at performing an appropriate clinical examination; interpreting the findings and organising further investigations when necessary to arrive at an appropriate diagnosis”.
- “Upon graduation a dentist should be competent to identify abnormal and anxiety-related patient behaviour and respond appropriately”.
- “Upon graduation a dentist should be competent to identify temporomandibular disorders and associated conditions”.
- “Upon graduation a dentist should be aware of his/her limitations and know when to refer a patient for specialist dental or medical care”.
- “Upon graduation a dentist should be taking radiographs of relevance to dental practice, interpreting the images, including managing and avoiding the hazards of ionising radiation”.
- “Upon graduation a dentist should be competent at promoting and improving the oral health of individuals, families and groups in the community” [9].

In fact, the authors of this article are of opinion that we need not engage in hair splitting discussions to find out differences between objectives, outcomes and competencies. The statements formulated should clearly indicate the goal, its relevance and each statement should be related to a particular area of knowledge, skill or behaviour. If the goal is observable and measurable, it will help the assessment process without ambiguity. The first step towards CBE should be taken by formulating competency statements specifically related to selected topics of dental science. Chandrasekharan Nair, *et al.* have published a flow chart on complete dentures. In this article 18 sections have been identified starting from examination to follow up of the patient and evaluations. The skills required can easily be identified by a meticulous perusal of this article [10].

Qualities of objectives

Based on Blooms taxonomy many authors have defined the qualities of specific learning objectives (SLO). Reasonably acceptable qualities of SLO are the following:

- Relevant (to the programme/course and to the community at large)
- Unequivocal (leaving no doubt: clear, unambiguous, unquestionable)
- Observable (change- example: change in attitude)
- Measurable (this will help in assessment – if the student is expected to enumerate four factors and could state only three, the scored marks will be less by 25%)
- Feasible (realistic goals should be stated. Example-enumerate sixty aetiological factors related to the resorption of residual ridge – almost impossible) [11].

Competencies are also observable abilities required for the successful practice of medicine/dentistry. Competency statements are formulated according to the needs of the patients, society and the practised system of health care. CBE includes highest level of cognitive abilities such as ethical decision making, maintaining professionalism and lifelong learning, clinical and communication skills, leadership and team work [12]. The education council of Netherlands has given a statement highlighting the features of competency as follows: “specific, integrative, durable, focused on performance, learnable, and mutually dependent” [13] Objective and competency statements are almost similar in content and spirit.

Teaching methods in CBE

From the 14th century, lecture is considered as a popular teaching method. Once medical education got evolved, it has accepted

lecture as the effective teaching method. Still that practice is continuing in both medical and dental education and all other allied fields. Educationists have done observational studies and questioned the effectiveness of lecture in obtaining student participation. During lectures students do not always give feedback and lecturers are under the impression that students learn at the same pace and at the same level of understanding. Carroll has disputed this and stated that each student's aptitude differs and the requirement of time also varies [14,15]. The concept of flexible time in learning has come to CBE through this path of thinking.

Flipped class rooms (FC)

Conventional lecture class is usually followed by homework mostly prescribed by the teacher. But in flipped class room, homework precedes the lecture class. In simple terms flipped learning can be defined as "school work at home and home work at school". Because of the switching of the components, this pedagogical model obtained the name 'flipping'. Flipped learning network that consists of experienced flipped educators have formulated a definition like this- "Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter".

Conduct of flipped class rooms consist of four steps: 1. designing and prescribing the homework, 2. monitoring the progress of homework, 3. conducting the lecture session and group discussions with active participation of the students and 4. assessment/evaluation.

Flipped learning is student centered and built upon four pillars:

- Flexible environment
- Learning culture
- Intentional content and
- Professional educator.

Students are allowed to choose the learning space either in their homes or a flexible space arranged in the school. Students can work independently or in group and can have discussions on the study material made available by the teacher or from internet sources. There is no restriction on the timings. Students can acquire knowledge and evaluate their own learning. Teachers determine the content of learning to be taken up in the class and what the student should acquire on their own. The responsibility of the educator is more than with the conventional teacher. Students are closely watched and given timely feedback. The teacher's role is never felt as prominent [16].

Unknowingly touching a hot vessel stimulates an action and the hand is moved away by the reflex action. Conventionally it was thought that in the class room when the teacher gives instruction (which serves as a stimulus), the student can absorb it as such (which serves as response). In fact, the stimulus-response mechanism does not happen in the class room evidenced by the fact that only 5% retention happens through lectures. Dewey has raised doubts on the effectiveness of teaching and learning that happens in the class room [17]. He said that teaching and learning will not happen in a closed system. In FC the learning occurs beyond the class room. Lectures made by the teachers, activities that are designed to happen both inside and outside the class room forms a scaffolding and which facilitates learner centred environment. FC is a popularly accepted instructional method in CBE.

Scaffolding

Scaffolding is an educational process where the teacher's support is gradually reduced and the student is made to become competent. Teachers carefully plan to reduce the support for the content, processes and learning strategy. The proficiency of the student is enhanced in a planned way. The teacher initially evaluates the student's knowledge and skill levels before planning the scaffolding. If impression in complete dentures has to be taught, the information is given in smaller portions and students are encouraged to find out the details from study materials, text books, internet resources etc so that the student feels that I learned it by my own effort. Teachers may use formative assessment in this stage and as the student progresses even assessment can be tapered. Students who do not have adequate understanding of a subject, if instructed with concepts will end up in frustration, confusion and failure. The zone of proximal development should be identified and adequate assistance be imparted (Figure 1). The scaffolding flow is as follows: 1. Assessing the student's knowledge level, 2. Learning goal is set, 3. plan instructional support, 4. Instruction is given, progress is observed, formative assessment and feedback 5. Reduce the teacher's support if student shows satisfactory progress, 6. Build the content or subject and this system continues. No pressure is given for the time taken and student can learn on his own [18,19].

In the context of competency based education, collaborative learning where students work in small groups, is gaining importance. Group interactions are emphasised more than the individualistic learning. Problem based learning (PBL) and Team based learning (TBL) fall into this category. In PBL, a relevant problem is raised and students are encouraged to find out the knowledge gaps they have and explore the answers in a group. A teacher will guide the group when required and students can utilise online resources also. In TBL, the teacher conducts many small group discussions,

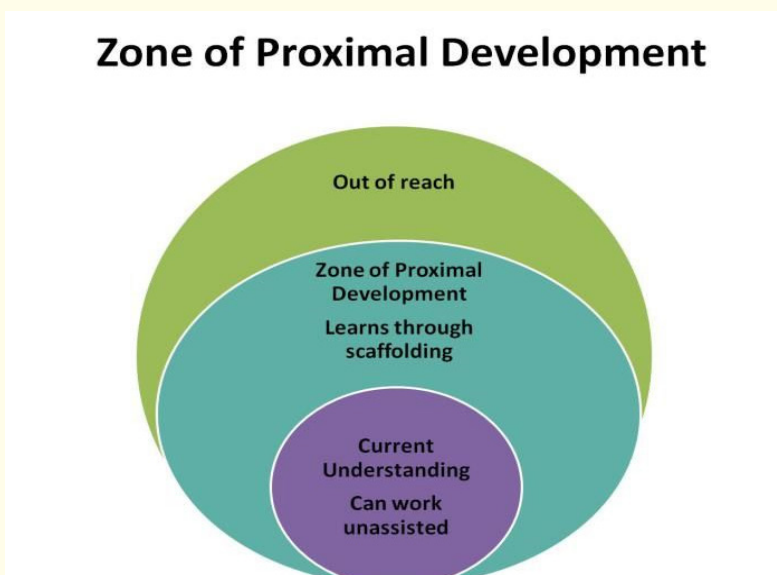


Figure 1: Zone of proximal development

each group consisting of 5-7 students. The faculty member provides guidance as well as feedback to the learners. Opportunities are provided for both intra group and inter group discussions [20,21]. It can be noticed that conventional instructional methods like lecture and group discussion are carefully integrated into the FC system but students are more active and teacher’s guidance is slowly tapered. Teacher can monitor and provide appropriate feedback.

Assessment in CBE

When we design the curriculum of a course, the objectives or the outcome we would like to have from the students are also simultaneously designed. To verify whether the student has achieved the desired outcome, we have to conduct an assessment; a few decades ago, it was known as ‘evaluation’ (Figure 2). Two

types of assessments are usually carried out – formative and summative. Formative assessment consists of small tests on smaller content areas. The marks obtained will serve as a feedback to both the student and the teacher. It will act as a stimulus for the student to work hard. Teachers were interested to find out the level of learning; otherwise, it is ‘assessment of learning’. At the end of the assessment, students were awarded with degrees. Once competency based education has come to the fore front, there happened a conceptual change and ‘assessment for learning’ got precedence. CBE uses formative assessment effectively which has a driving effect on the student to learn and teachers get an insight into the student’s readiness to progress. Student actively participates in the learning process and formative assessment forms an effective tool in CBE [22,23].

The classic Miller’s pyramid stratifies learning into four levels.

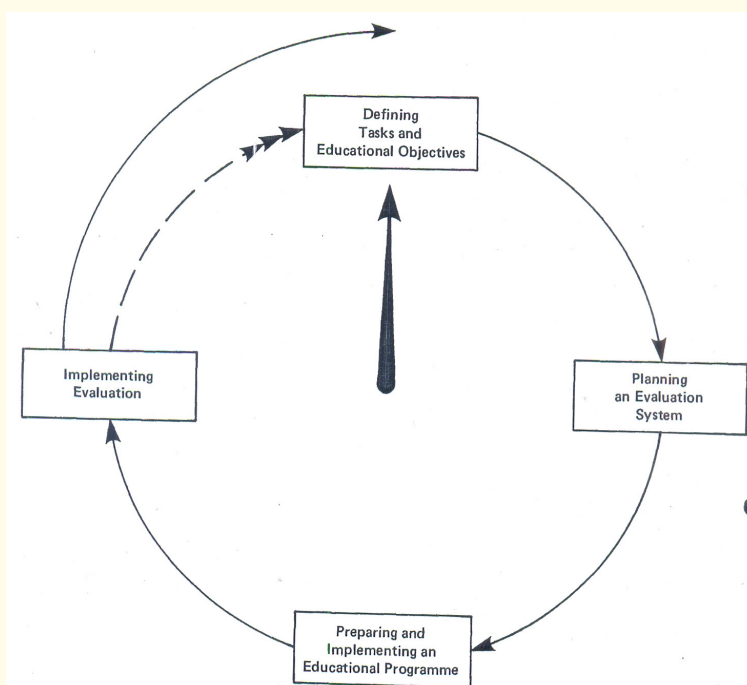


Figure 2: Educational spiral indicating objectives, teaching learning methods and evaluation.

At each level, formative assessment is incorporated. At the base level, the student knows, that means he is aware of it. At this stage the assessment is based on facts and usually MCQs, short answers and viva voce are employed. At the 'knows how stage' same assessment tools are used but description of a case will be given as the basis. In the 'shows how stage', the performance of the student is

assessed through *invitro* tests, mannequins-based tests and objective structured clinical exams (OSCE). When the student reaches the apex, he routinely does patient management and performs specified skills. Other than the performance assessment, peers and other staff also provide feedback or 360°assessment (Figure 3).

Characteristics of assessment have been defined by many

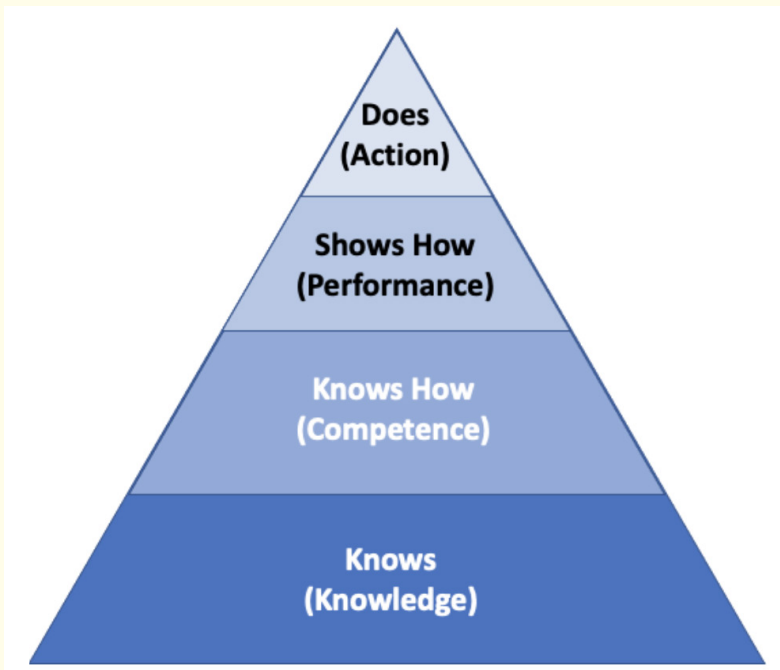


Figure 3: Millers pyramid showing levels of learning.

pioneer educationists and listed the following: Relevance, Validity, Reliability, Objectivity and Feasibility. Once competency based education was set in, the attributes have changed the hierarchical pattern to Reliability, Validity, Feasibility, Acceptability and Educational impact. Some educationists have added Fairness and Transparency to this list.

Validity

A teacher designs an assessment tool with a particular intention. If the tool satisfactorily achieves the intention, then the tool can be considered as valid. A wooden block is kept on the table along with a length measuring tape and a spring balance. The question given to the student is to calculate the volume of the block. The student has to select the appropriate instrument. There is no second chance. If the tape is selected, that is a valid tool for calculating the volume. If the spring balance is selected, the weight of the block may be found out but not the volume. This is the importance of validity while designing an assessment tool. In fact, in education, validity is not as straight forward as cited in the example.

Four major considerations related to validity are content, construct, criterion and consequential. The content or subject matter to be tested should be predetermined and the assessment task should have capability to test that particular area. While framing the assessment tool, the learning objective should also be considered. The task should indicate the psychological capabilities required to face the assessment like comprehension, reasoning or problem solving and hence this facet of validity is termed as construct validity. Criterion validity indicates the purpose for which assessment is done. The assessment tool should indicate or screen the eligibility of a graduate to join PG course in Prosthodontics or Oral surgery. Consequential validity indicates the consequences of using a particular assessment system like positive or negative stimulants it creates. Did the assessment motivated the students or disappointed them? Did it lead them to superficial learning or in depth learning? Validity should be the primary consideration while designing an assessment tool which might finally decide the success or failure of the system at large.

Reliability

An assessment tool should give consistent results across time, across tasks and across evaluators or examiners. High level of consistency will produce reliable results. In our flower markets Jasmine mala is kept in rolls. When you ask for a measure, the vendor uses his or her elbow-fingertip distance as a scale. With different vendors and with different times the length of the mala varies. If the vendor was using a foot scale, the length would always be the same or it is reliable. In assessment, reliable tools should be used. Maybe it is not practical always. What we generally do is to employ multiple tests and multiple evaluators. That is why in our universities, two/four examiners are appointed, to make the results reliable [24].

Feasibility

In a dental college, if the admission strength is hundred, it is difficult to conduct the final assessment by asking the student to make a final impression on a live edentulous individual. Either the assessment has to be conducted in sessions or make use of good quality mannequins. For examiners also, it becomes a tiresome task defeating the purpose of unbiased assessment. While deciding the feasibility of assessment, ease of administration, time and resources required, maintenance of equivalence in administering so that reliability does not become questionable. Scoring accuracy and interpretation possibilities are factors that are to be considered along with feasibility.

Acceptability

Assessment should desirably be acceptable to students, teachers who become assessors and the management of institutions. However, the policy makers should give priority to the needs of the society, of which health needs are our major concern. For all student entrance examinations, MCQs based assessments are accepted all over the world. Formulating items of MCQ, strict scrutiny should be exercised to check validity and reliability. Sanctity of the assessment should not face questionable status by way of dilution of quality and by awarding grace marks.

Educational impact

Assessment has a direct impact on the student when he/she fails. His time and parents' money are irrecoverably lost. The psychological damage it causes is tremendous if the student really deserved a pass. If an undeserving student is passing the qualifying examination, the impact will be on the society. The society has to suffer from the incompetent patient management and the effect will be long lasting; transcending into generations [25,26].

Assessment can promote learning, develop thinking and can enhance creativity. Confidence of the student will improve to face challenges and will be capable of making use of opportunities. Academic performance will improve and the student becomes career ready. Institutions will refine their teaching methods because of the impact of assessment and subsequent results.

Assessment tools

Long time ago, the tools for assessment (evaluation) used in medical and dental education were essays/ short notes for knowledge based theory examination and the most dreaded "Oral" (Viva voce) for clinical examination. Still the system is practised in many countries including India. Once competency based education got introduced, the assessment instruments got changed to suit the requirements of CBE and to improve the qualities of validity and reliability. A few popular instruments are enumerated below.

- Multiple choice questions (MCQs) – this is the most popular tool used mainly for screening to get admission to a course. It has a short stem and four options in which one will be the correct answer.
- Patient Management Problem (PMP) - The examinee is given a hypothetical real-life situation and few situations are provided from which the correct one has to be selected. Valid resources are also provided. When computers are integrated, the assessment session becomes an effective learning experience
- Oral examination – It is used in the clinical examination sessions and to test the higher levels of knowledge. Abilities like decision making, defence in the argument and performing under stress can be explored with oral examination. If the examiner is not very careful, biases can creep in. Structured viva-voce is recommended by some educationists where the candidate selects his or her questions from a set of questions provided, so that examiner's biases are obviated. But oral examination will lose its spontaneity.
- Long case - This is done on real patients. In dental subjects, long case includes initial clinical examination of the patient, investigations, treatment planning, presenting the plan and facing a viva, performing selected stages of the treatment and assessment of the treatment performed.
- Objective Structured Clinical Examination (OSCE) – This comprises of different stations where students get opportunities to demonstrate competencies in communication, history recording, physical examination of standardised patients, interpretation of findings observed in mannequins, computerised cases for analysis, interpretation of tests, giving instructions and prescriptions etc. Students visit each station in a round robin fashion.

- Video on doctor-patient encounters will be shown and student has to express his opinion on the incident.

Essay is a common tool used in cognitive assessment but once CBE has been accepted as the norm, essays started vanishing from the assessment arena. While writing an essay, the students' ability to write a comprehensible passage is tested. Keeping the objectivity in focus, how the student expresses his analytical skills can be assessed while writing an essay. Present day students use too many bullet points (bullet points only) while answering an essay question. This is reflected in the poor quality of the published papers or the high-rate of rejection from the journal editors. Educationists lament that long essays are assessing the memory only; partly it is true. But discarding essay has a disastrous effect on the publication of research work. No one will say that publication is a wasteful exercise.

All is not well

Competency based dental education has its origin from the article of Chambers which was published in 1997 [6]. In India the new dental curriculum has emerged very recently. But in medicine, competency based education was proposed in 2011 by the Medical Council of India. Internationally the origins of CBE can be traced back to 1960s when it was accepted for general education. A lot of explanations and evaluations on CBE continued but still as an educational concept it is not fully endorsed by all the sections of teachers, educational institutions and by educationists. In a study conducted amongst US and Canadian medical schools, only 58% were of opinion that useful changes had happened with curriculum and clinical programmes due to CBE. The difficulty faced by the faculty was in taking hard decisions on incompetent students. 27% expressed that the quality of graduates improved but 23% felt that everything continues the same old way. 10% felt that the work involved is more [29]. In an editorial written by Sengupta A, a question raised is that the present CBME has given overemphasis to skills and is neglecting knowledge. He has expressed his concern that without adequate theoretical background, our graduates might become 'quacks'. The CBME schools raise the question that without the ability to perform what is the great idea of mastering knowledge according to Bloom's taxonomy. The present day teachers and universities should find an effective median path by integrating knowledge, skills and professionalism [30]. William Osler's words must be remembered in this context "The whole art of medicine is in observation... but to educate the eye to see, the ear to hear and the finger to feel takes time, and to make a beginning, to start a man on the right path, is all that you can do" [31].

Discussion

Traditionally medicine was trained with more emphasis on the knowledge factor. Dentistry was predominantly a skill based pro-

gramme and hence an elaborate preclinical training system was employed before the clinical training started. Mannequins were popularly used in the name of 'phantom heads' much before the medical counterparts adopted it. Virtual reality and Artificial intelligence based training is becoming popular now. Competency required for a professional has to be defined clearly and specifically and it should have the character of measurability. Even if there is one student or fifty students, the judging parameters should remain the same and it will not depend on the performance of other students. All the students should have achieved the competency when the training is complete. The assessment process should be very transparent [32].

In CBE, patient care and procedural skills are given top priority followed by knowledge, professionalism, communication skills, practice based learning, life long learning, problem solving and team work. In the traditional mode, the driving force for the curriculum is acquisition of knowledge where as in CBE, the application of knowledge is given emphasis. In the traditional mode, students learn from the teacher- whatever he says or shows but in CBE, the student learns by himself and the teacher stands by the side - learning is a joint effort. The content of learning is decided by both the teacher and the student and there is no restriction on learning. In traditional mode summative assessment is given emphasis where as in CBE formative assessment is given precedence. In traditional system the course duration is fixed but in CBE the duration is variable [33].

In the traditional system, the curriculum is marked by the spiral format that annotates the objectives, teaching learning methods and evaluation. In CBE, list of objectives is replaced with list of competencies. Teaching and learning are replaced with learning with the facilitator by the side. Lectures within the class room is replaced with flipped class rooms. Evaluation is substituted with assessment. Essays are not popular now. MCQs and oral examinations are still popular. Long cases and short cases remain to be the best option to assess clinical acumen comprehensively. OSCE and OSPE are slowly taking centre stage but teachers find it very difficult to design stations with fresh content. AI might provide new contents in assessment. Definition of a competent professional is not fully understood and hence more and more complicated definitions are made to get a palpable feeling of competency. Assessment of problem solving capability is not easy and so to say it remains as a problem. If implemented, though it takes time, CBE has the advantage of ensuring quality of professionals and that is the need of the society.

With CBE, the students' role will be transformed from a passive participation to active contribution. CBE is expected to embolden the students to face problems that may arise in the clinic. Students

will learn to analyse critically based on relevant evidences. Interdisciplinary understanding and capability to utilise database searches to collect evidences will be part of the trainee's capability. CBE makes the graduate practise ready; that is a great advantage. Assessment will become more valid and reliable [34]. After a decade, we will be able to experience the changes in the quality of our dental professionals.

Conclusions

Competency based education will have a transformative effect on the training of health care professionals in acquiring demonstrable skills, knowledge, values and professional standards essential for patient care. The conscious shift from traditional time bound curriculum to outcome focused educational model will ensure the development of health care professionals with proven theoretical knowledge and proficiency in skills with confident practice readiness that is the need of the hour. Adoption of the CBE will foster continuous assessment that will allow identification and bridging the gaps in individual competency levels thereby improving the readiness to accept vastly changing profiles of modern dentistry and medicine. Professionals should do a soul searching in adopting CBE and contribute towards it with personal inputs.

Author Contributions

Conceptualization- Eldo Koshy, K. Chandrasekharan Nair, Review of articles- Pradeep Dathan, Lovely Annamma; Initial draft preparation: Viswanath Gurumurthy, Pradeep Dathan; Lovely Annamma Review and editing- K. Chandrasekharan Nair; Eldo Koshy, Supervision- K. Chandrasekharan Nair.

All the authors have read and agreed to the published version of the manuscript.

Conflict of Interest

The authors do not declare any conflict of interest.

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Figure 2: Educational spiral - Guilbert J J; Educational handbook for health personnel, WHO, Geneva, 1981

Figure 3: Millers pyramid: <https://books.macpfd.ca/etmp-vol4/chapter/chapter-6-millers-pyramid/>