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REVIEW ARTICLE

Tutorial in medical education: A review of contextual modifications

Tripti K Srivastava[1], Lalitbhushan S Waghmare[2]

[1]Department of Physiology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Sawangi (M), Wardha, Maharashtra, India, [2]Department of Physiology, Interdisciplinary Health Sciences, Datta Meghe Institute of Medical Sciences, Sawangi (M), Wardha, Maharashtra, India

Correspondence to: Tripti K Srivastava, E-mail: drtriptisrivastava@gmail.com

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ABSTRACT

Tutorial has embodied a major teaching–learning strategy in basic science of medical education and is widely researched for its effectiveness in learning outcomes. It is a class or short series of classes in which one or more instructors provide intensive instruction on a subject to a small group. Medical students, during tutorials, are trained to develop and test their ideas, clarify concepts taught in lectures, define new problems, seek solutions, cultivate problem-solving skills, and indulge in self-learning. Literature identifies certain important issues with respect to challenges and limitations of conventional tutorial method. Constraints such as lack of structural uniformity, financial and resource limitations for teaching in small groups, and short supply of dependable peer tutors are a few recognized challenges. Available bodies of research also suggest need-based modifications to overcome the operational difficulties without compromising the integrity of tutorial. The proposed alterations can be of consequence in developing professional competencies such as interpersonal and self-directed learning skills. It is apparent that different tutorial formats may be optimal in different fields and levels of study and hence should be piloted as per the local need and relevance.

KEY WORDS: Medical Education; Tutorials; Challenges

HISTORICAL PERSPECTIVES

Tutorial, one of the oldest yet equally significant teaching methodologies today, was formally established 130 years ago as the cornerstone of education at University of Oxford. Till date, it retains its prestige and effectiveness. The role of tutors in tutorials was documented in 15th century. The Oxford tutors were described as "having responsibility for the conduct and instruction of their young colleagues."[1] Tutorials suffered a rough terrain in 1960s, but Moore's argument that tutorial ensures individual focus and unique ability to foster dialog, argumentation, and independent thought revived its relevance in higher education. Since then, criticisms against tutorial took a back seat and it was widely accepted in higher education.[1] In September 1964, the Faculty of Medicine at McGill University introduced tutorial system for the 1st year students. The introduction was based on student feedback, which stated that they pass through the 4 years of undergraduate medical education with just superficial personal contact with faculty members. They specified that the guidance in medical career had come too late in their student years, and the knowledge that has been acquired bears a vague relationship to actual medical care. This was contrary to what they had expected to encounter in a medical school.[2] Tutorial was later considered as a relevant strategy to enable students with specific competencies and enable them to apply it suitably in clinical decision-making.

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Since then, tutorials have embodied a major teaching learning strategy in basic sciences of medical education. It is widely researched for its effectiveness in learning outcomes.[3]

TUTORIAL OVERVIEW

Tutorial is a class or short series of classes, in which one or more instructor provides intensive instruction on some subject to a small group.[4] Various attributes of a tutor are shown in Figure 1.[5]

The prime focus is to make learning multi-directional by involving other students and tutors. Exploring students' point of view, allowing time for discussion, and inculcating self-directed, reflective learning skills remain the mainstay of an effective tutorial session.[6] Beck (2007) analyzed the pedagogy of tutorial and concluded that the principle goal is to "systematically train metacognitive (thinking about thinking) powers" or "enable students to learn to think for themselves."[7]

Tutorial is essentially interactive. A significant proportion of the interaction comes from the learner. A learner tries to connect the knowledge gained in lectures into logical and practicable framework that helps deal with clinical issues. It guides and regulates reading on the part of the student with parallel guidance from lectures; ensuring understanding of the subject. The discussion confronted in tutorial helps learners to appreciate the significance and implications of their knowledge. The dialog between student and tutor provides a lot of opportunity to clear doubts and explore different styles of learning. The major advantage is that all learners get the opportunity to participate, contribute, and ventilate their concerns. Uncertainties are freely raised and immediate feedback can be given.

ROLE OF A TUTOR

The enthusiasm and creativity of tutors are essential to make tutorial truly effective. The tutor's responsibility is to create an environment that encourages participation of all members of the group.[5] The efficacy of a tutorial class, to a large extent, depends on motivation and depth of knowledge of the tutor.[8] The tutor's ability to provoke thinking and reflection are mainstays of a tutorial session. Literature has also explored the possibility of senior students as peer tutors. Students as peer tutors are readily accepted by learners and can create a constructive educational opportunity besides furthering their own academic development.[9] The process can establish a close relationship between student and tutor, enriching the student's university experience and support overall personal development for a better professional life. Ashwin very well founded the hierarchy of tutorials by identifying four distinct tutorial styles, i.e., (1) tutor explaining the student what the student does not understand, (2) tutor showing the student how to see the subject in the way that the tutor does, (3) tutor bringing things in relation to each other to help the student develop a new perspective in the wider context of the discipline, and (4) tutor and the student exchanging different points of view on the topic and both coming to a new understanding.[10]

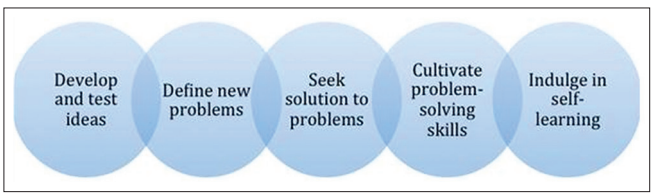

Figure 1: Attributes of a tutorial session[5]

CHALLENGES IN CONVENTIONAL TUTORIALS

The research concerning tutorials has evolved over the years. Available literature identifies certain important issues with respect to challenges and limitations of conventional tutorial method. It also suggests need-based modifications to overcome the operational difficulties without compromising its integrity. Constraints such as lack of structural uniformity,[11] financial and resource limitations for teaching in small groups,[12] and short supply of dependable peer tutors[13] are some of the issues well addressed, and appropriate measures have been suggested to combat the same. Other cognizable concerns are massive paradigm shift in pedagogy in medical education and dearth of teaching faculty. With existing staff strength as per the current scenario, conducting series of conventional tutorial for small groups is an arduous task. Conventional tutorials also are inadequate to promote active learning.[14]

THE CONTEXTUAL MODIFICATIONS

The various strategies documented in the growing body of evidence give simple and contextual solutions to make learning purposeful and rewarding through tutorials. Most of the modifications are aimed toward establishing group dynamics, active interaction, and enhancing presentation skills as some of the supplementary.[3] Few significant approaches are stated below (Table 1 depicts varied approaches along with their rationale and important considerations).

Debate Style Tutorial (2006)[8]

Students are divided into small group of 4-5 each. In the first session, the debate is conducted within the group. The second debate is conducted between the groups. The final session concludes with an open, formal debate. The debate format can vary as per operational convenience. Each group and tutor evaluates the other groups' performance. The purpose is to develop students' logic, broaden their vision, and encourage them to express their opinions.

Table 1: Comparative depiction of various modifications and its rationale

Reference	Modification type	Rationale for modification	Modified method	Considerations
Shingaki et al.[8]	Debate style tutorial	The style of conduction of tutorial depends on the tutor and hence its efficacy is very subjective The purpose of this approach is to develop students' logic, broaden their vision, and encourage them to express their opinions	Students are divided into small group of 4-5 each. In the first session, the debate is conducted within the group. The second debate is conducted between the groups. The final session concludes with an open, formal debate. The debate format can vary as per operational convenience. Each group and tutor evaluates the other groups' performance.	The debate needs to be properly structured with defined objectives so as to ensure a desired outcome
Gleeson et al.[15]	Collaborative learning tutorials	The idea is to encourage students to teach each other, to unravel problems themselves, and to explain the issues to their peers	Prior to actual tutorial; students are asked to attempt exercise questions that directly relates to the lecture. In the 1st h of tutorial, students discuss the answers to those questions in their groups. During this time, tutor monitors the discussion, facilitates discussion, and clarifies issues. The groups construct their own answers to the questions posed. Later, the answers are discussed by the whole tutorial body and the tutor. Specific group presents their answers, which is followed by the other tutorial members commenting on the answers. The tutor also adds his or her comments. During the last 15 min, students individually appear for a written test based on the tutorial content	Tutor should be well prepared and sensitized for the role. It is a time-consuming approach
Sivagnanam et al.[14]	Student-led Objective Tutorial (SLOT)	Medical education is experiencing a dearth of teaching staff, hence conducting conventional tutorial for small groups is challenging. The conventional tutorial lacks active participation by every student and adopts passive learning strategies The key issues addressed in this approach are; the value of working in small groups, providing an opportunity for active learning, addressing limited faculty time and utilization of visual aids as a presentation tool	Students are divided into small groups with a self-elected group leader. Subtopics of the preceding lecture topics are allotted to the leader. Each group is instructed to read the given subtopic and prepare three to five MCQs in PowerPoint for the tutorial session. The students can approach the lecturers for clarifications in the interim period. On the day of tutorial, one group displays the MCQ and next group is expected to respond. If the answer is incorrect, the question passes on to subsequent groups. Irrespective of the nature of responses, the next slide displays the correct answer. The third slide displays the objective for setting the question. This process is repeated until all the groups complete their presentations. All groups get equal chances of posing and answering questions. The sessions are monitored, intervened, and facilitated by teachers	Ensuring self-study on the part of learner is a challenging task. The students have to be trained regarding framing MCQ so that during tutorials the focus lies on the subtopics rather than the quality of MCQ
Kibble[13]	Peer-led supplemental tutorial	There is a need to provide academic support beyond what can be offered in traditional school hours The goal is to develop a tutorial program that could be used by a large number of students and that makes efficient use of student time	In this method, 8-10 high achievers from previous semester are identified as potential tutors and are invited to participate by e-mail. They are oriented about the method of conducting tutorials and are given a package of written case materials with model answers. The case-related problem consists of a series of questions, intended to facilitate discussion and collaboration among students. Tutors are asked to refrain from giving didactic lectures and instead promote collaboration and discussion among their students. It is a practical and acceptable way of providing academic support to students in a large class. It advocates the benefits of involving peers for student learning, improved academic performance, reduced attrition rates, and the development of transferable skills	Appropriate training of peer tutors is the mainstay of this approach

(Contd...)

Table 1: *(Continued)*

Reference	Modification type	Rationale for modification	Modified method	Considerations
Somannavar, et al.[16]	Learner-centered tutorial program	The conventional tutorial program does not appear to develop higher order thinking skills, such as analyzing, synthesis or evaluation, decision-making, and problem- solving This approach emphasizes the instructor's role as facilitator and students as learning partners. It provides opportunity for demonstrations and practice sessions and facilitates self-directed learning	The students are divided into five small groups. They are intimated 1 week prior about the topic and are instructed to come prepared for allotted group tasks. On the day of tutorial, the presenter of the first group delivers a short lecture on the scheduled topic for 10 min. The presenter of the second group displays five MCQs to the class and each group is asked to identify the correct answer. In the next slide, the presenter points out the objective in setting each of the MCQ. Group three presenter discusses a case pertinent to the topic identified or developed by his group. Students are encouraged to use pictures and videos in presenting their case. Group four presenter discusses the answer for long essay question they have chosen. Group 5 presenter summarizes the session. The tutor facilitates the entire session and gives feedback	Ensuring self-study on the part of learner is a challenging task. It is a time-consuming approach
Srivastava and Waghmare[3]	Interactive intragroup tutorials	The conduction of tutorials with small group becomes impossible with limited number of faculty resources This approach offers a good alternative by enabling active participation and interaction without a drain on resources. Establishing group dynamics, active interaction, presentation skills, and competitiveness are some of the supplementary gains of this modification.	The topic along with its subtopics to be discussed is displayed on the notice boards 2 days prior. During tutorials, each group is subdivided into small group of 9-10 students. One subtopic is allotted to each group and they are asked to prepare a comprehensive write-up about that subtopic, following all the principles of group dynamics. They are provided 20 min for the same. The tutor monitors the intragroup discussions. Later, the groups are asked to present their content in front of large group by any member other than the group leader. After presentation, the other groups are asked to come up with missing points. All the groups present their work in the same manner. The tutor then sums up the entire discussion with pertinent points	The discussions need to be meticulously monitored by the tutor. It is a time-consuming approach
Parmar[11]	Interactive structured tutorials	Conventional tutorials lack structural uniformity and do not encourage participation of all the students Think, pair, and share is a simple yet effective technique to ensure participation of all the students in a small group. Structuring of tutorial increases their effectiveness as well as results in less wastage of time	Students are subjected to interactive structured tutorial via think-pair-share technique. It is structured by formulating specific learning objectives, classification of contents into must know, desirable to know and nice to know, and summarization of important points at the end. Special efforts are taken to identify the difficulty index of topic and repetition of terms and concepts that require in-depth understanding. The tutorial concludes with summarization of important points at the end	Needs a lot of background preparation for actual tutorial session

MCQ: Multiple choice question

Collaborative Learning Tutorials (2006)[15]

In this approach, prior to actual tutorial, students are asked to attempt exercise questions that directly relates to the lecture. In the 1st h of tutorial, students discuss the answers to those questions in their groups. The tutor monitors, facilitates discussion, and clarify issues. The groups construct their own answers to the questions posed. Later, the whole tutorial body and the tutor discuss the answers. During the last 15 min, students individually appear for a written test based on the tutorial content. This method encourages students to teach each other, unravel problem themselves, and explain the issues to their peers. It helps in a deeper understanding of the subject.

Student-led Objective Tutorial (2006)[14]

According to this method, students are divided into small groups with a self-elected group leader. Subtopics of the preceding lecture topics are allotted to the leader. Each group is instructed to read the given subtopic and prepare three to five multiple choice questions (MCQs) in PowerPoint for the tutorial session. The students can approach the lecturers for clarification in the interim period. On the day of tutorial, one group displays the MCQ and next group is expected to respond. If the answer is incorrect, the question passes on to subsequent groups. Irrespective of the nature of responses, the next slide displays the correct answer. The third slide displays

the objective for setting the question. This process is repeated until all the groups complete their presentations. All groups get equal chances of posing and answering questions. This approach enables active learning and enhancing presentation skills in spite of limited number of available tutors.

Peer-led Supplemental Tutorial (2009)[13]

In this method, 8-10 high achievers from previous semester are identified as potential tutors and are invited to participate by e-mail. They are oriented about the method of conducting tutorials and are given a package of written case materials with model answers. The case-related problem consists of a series of questions, intended to facilitate discussion and collaboration among students. Tutors are asked to refrain from giving didactic lectures and instead promote collaboration and discussion among their students. It is a practical and acceptable way of providing academic support to students in a large class. It advocates the benefits of involving peers for student learning, improved academic performance, reduced attrition rates, and the development of transferable skills.

Learner-centered Tutorial Program (2011)[16]

As per this approach, students are divided into five small groups. They are given 1 week prior intimation about the topic and are instructed to come prepared for their group tasks as outlined. On the day of tutorial, the presenter of the first group delivers a short lecture on the scheduled topic for 10 min. The presenter of the second group displays five MCQs to the class, and each group is asked to identify the correct answer. In the next slide, the presenter points out the objective in setting each of the MCQ. Group three presenter discusses a case pertinent to the topic. Students are encouraged to use pictures and videos in presenting their case. Group four presenter discusses the answer for long essay question they have chosen. Group five presenter summarizes the session. The tutor facilitates the entire session and gives feedback. This approach emphasizes the instructor's role as facilitator and students as learning partners. It provides opportunity for demonstrations, practice sessions, and facilitates self-directed learning.

Interactive Intragroup Tutorials (2014)[3,17]

According to this method, the topic along with its subtopics to be discussed is displayed on the notice boards 2 days prior. During tutorials, each group is subdivided into small group of 9-10 students. One subtopic is allotted to each group and they are asked to prepare a comprehensive write-up about that subtopic, following all the principles of group dynamics. They are provided 20 min for the same. The tutor monitors the intragroup discussions. Later, the groups are asked to present their content in front of large group by any member other than the group leader. After presentation, the other groups are asked to come up with missing points. All the groups present their work in the same manner. The tutor then sums up the entire discussion with pertinent points. The suggested modification provides an efficient alternative where number of faculty, though sparse, can still give personal attention to every student and is available to guide the discussion. Establishing group dynamics, active interaction, presentation skills, and competitiveness are some of the complementary gains of this modification.

Interactive Structured Tutorials (2015)[11]

Students are subjected to interactive structured tutorial via think-pair-share technique. It is structured by formulating specific learning objectives, classification of contents into must know, desirable to know and nice to know, and summarization of important points at the end. Special efforts are taken to identify difficulty index of topic and repetition of terms and concepts that require in-depth understanding. The tutorial concludes with summarization of important points at the end. Think, pair, and share is a simple yet effective technique to ensure participation of all the students in a small group. Structuring of tutorial increases their effectiveness as well as results in less wastage of time.

CONCLUSION

The growing body of evidence about tutorials in medical education is a testimony to its efficacy as a teaching–learning method. The proposed modifications can prove to be of consequence in developing professional competencies such as interpersonal and self-directed learning skills. It is apparent that different tutorial formats may be optimal in different fields and levels of study and hence should be piloted as per the local needs and relevance. One should be cautious of generalizing the experience or assuming that positive student perceptions necessarily imply the actual improved performance.

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