TEHRAN UNIVERSITY OF MEDICAL SCIENCES

Department of Medical Education

Introduction Booklet

By:
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Dr. Maryam Alizadeh
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Reza Zaeri

2023

Tehran University of Medical Sciences

TUMS is the oldest and most well-known medical center in Iran, nationally as well as internationally. TUMS, as one of the country's top research universities, accepts applications from the most qualified students. It also has the largest schools of medicine, dentistry, pharmacy, rehabilitation, allied medical sciences, public health, advanced technologies in medicine, nutritional sciences and dietetics, and nursing and midwifery in Iran as well as a virtual school. Over a hundred specialized research centers such as Health Professions education, Science and Technology in Medicine, Rheumatology, Auditory, Digestive Disease, Skin Diseases and Leprosy, Trauma, Hematology and Oncology, Cardiovascular Diseases, Endocrinology and Metabolism, Reproductive Health, Urology, Immunology, and Asthma and Allergy are under the immediate supervision of this university.

Department of Medical Education

The Department of Medical Education at Tehran University of Medical Sciences is dedicated to becoming the foremost hub of scientific advancement and research in the field of medical education, not only within the nation but also across the broader region. With a steadfast commitment to excellence, we aspire to lead the way in shaping the future of medical education and inspire the next generation of medical professionals to strive for greatness

Our Mission

Since its inception in 2006, the Department of Medical Education at Tehran University of Medical Sciences has been committed to empowering graduates with the knowledge and expertise they need to excel in their careers. To achieve this mission, we have assembled a world-class team of passionate faculty members and experts who are deeply invested in tackling the complex issues of medical education in today's fast-paced and ever-evolving world. Through our unwavering dedication to excellence, we seek to inspire and equip the next generation of medical professionals to make a positive impact on the world.

Students’ competencies

- Identifying educational issues through thorough research and providing logical and measurable solutions to address them effectively.
- Assisting in the strategic planning and management of educational challenges in medical universities, while facilitating the adoption of appropriate technologies and pedagogical methods.
- Playing a pivotal role in the advancement of medical universities by conducting comprehensive assessments of their strengths and weaknesses, and recognizing the key factors that contribute to the progress and development of renowned global universities.

Our TEAM

Our team in the Department of Medical Education is dedicated to teaching and supporting students in their medical education journey

First affiliated members

Roghayeh Gandomkar

Chair of department

Ph.D. of medical education
Fields: Evaluation, Self regulated learning

Maryam Alizadeh

Ph.D. of medical education
Fields: Teaching and learning, Motivation, Metamotivation, Visual thinking strategies

Maryam Karbasi

Ph.D. of medical education
Fields: Innovation in medical education, IPC

Mahboobeh Kh. Mafinejad

Ph.D. of medical education
Fields: Curriculum planning, Instructional design, Student assessment

Mandana Shirazi

Ph.D. of medical education
Fields: Simulation, Art in medical education, BEME

Second affiliated members

Ali Jafarian

MD
Fields: Academic Leadership

Azim Mirzazadeh

MD, Dip HPE
Fields: Curriculum Planning, Evaluation, Accreditation

Aeen Mohammadi

Ph.D. of Medical education
Fields: E-learning, System metrics, Assessment, Evaluation

Mohammad Shariati

MD
Fields: Academic Management

Shiva Shirazian

DDS, MSc
Fields: Communication Skills

International Programs

Ph.D. of medical education

One of the main concerns of medical universities in Iran is promoting the quality of medical education through applying concepts, findings and theories of educational sciences to different disciplines of medical sciences. The PhD of Medical Education provides such an opportunity. This program is recommended to all professionals who work in an educational health related setting and have a desire to foster their professional learning and enhance their prospective career. This major with a focus on teaching and training is suitable for those who wish to gain further skills and knowledge in the area of Medical Education.

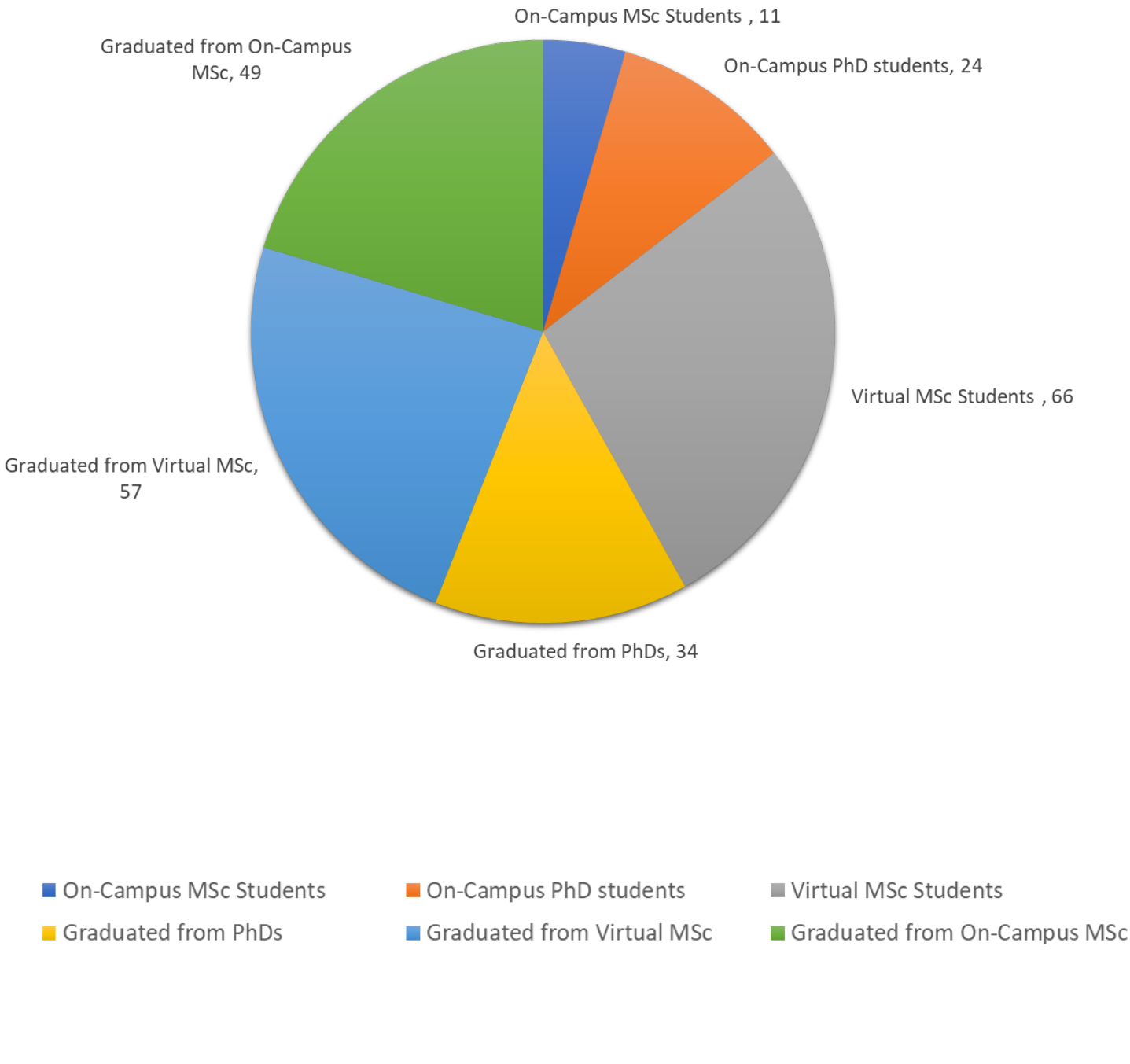
International Programs

MSc of medical education

MSc in Medical Education is an interdisciplinary program in which graduates would be able to help the instruction process by performing research and finding logical answers. The program, with a special focus on educational sciences is designed for those wishing to develop their roles as educators. Candidates will learn to use suitable teaching strategies and educational theories to enhance the quality of education. Those with a master in Medical Education will be able to prepare lesson and course plans, together with proper educational instructions. They can help educational groups to revise and correct educational programs. They can cooperate with educational groups in universities and colleges to develop more effective educational strategies. They will additionally design and perform suitable pieces of research in order to recognize educational problems and provide suitable solutions respectively.

Our National level Programs

Updated, June 2023



Our Prominent Publications

MEDICAL TEACHER
https://doi.org/10.1080/0142159X.2018.1552732

MEDICAL TEACHER
Taylor & Francis

BEME GUIDE

The utility of mini-Clinical Evaluation Exercise in undergraduate and postgraduate medical education: A BEME review: BEME Guide No. 59

Sara Mortaz Hejri[a], Mohammad Jalili[a,b], Rasoul Masoomi[a], Mandana Shirazi[a,c], Saharnaz Nedjat[d] and John Norcini[e]

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ABSTRACT

Background: This BEME review aims at exploring, analyzing, and synthesizing the evidence considering the utility of the mini-CEX for assessing undergraduate and postgraduate medical trainees, specifically as it relates to reliability, validity, educational impact, acceptability, and cost.

Methods: This registered BEME review applied a systematic search strategy in seven databases to identify studies on validity, reliability, educational impact, acceptability, or cost of the mini-CEX. Data extraction and quality assessment were carried out by two author. Discrepancies were resolved by a third reviewer. Descriptive synthesis was mainly used to address the review questions. A meta-analysis was performed for Cronbach's alpha.

Results: Fifty-eight papers were included. Only two studies evaluated all five utility criteria. Forty-seven (81%) of the included studies met seven or more of the quality criteria. Cronbach's alpha ranged from 0.58 to 0.97 (weighted mean = 0.90). Reported G coefficients, Standard error of measurement, and confidence interval were diverse and varied based on the number of encounters and the nested or crossed design of the study. The calculated number of encounters needed for a desirable G coefficient also varied greatly. Content coverage was reported satisfactory in several studies. Mini-CEX discriminated between various levels of competency. Factor analyses revealed a single dimension. The six competencies showed high levels of correlation with statistical significance with the overall competence. Moderate to high correlations between mini-CEX scores and other clinical exams were reported. The mini-CEX improved students' performance in other examinations. By providing a framework for structured observation and feedback, the mini-CEX exerts a favorable educational impact. Included studies revealed that feedback was provided in most encounters but its quality was questionable. The completion rates were generally above 50%. Feasibility and high satisfaction were reported.

Conclusion: The mini-CEX has reasonable validity, reliability, and educational impact. Acceptability and feasibility should be interpreted given the required number of encounters.

Background

Assessment plays a central role in medical education. It completes the learning process by monitoring students' progress and achievement regarding the curriculum outcomes. Several tools have been developed for serving this purpose. One of the most frequently-used assessment tools that measure trainees' performance in workplace settings is the mini-Clinical Evaluation Exercise (mini-CEX). An expert, usually a faculty member, observes the actual performance of trainees, rates a variety of their clinical skills, and provides feedback to them (Norcini et al. 1995).

Since its introduction in the 1990s by the American Board of Internal Medicine (ABIM), the mini-CEX has been widely used for different populations and in different contexts around the world. Our scoping search yielded many papers reporting the application of the mini-CEX for either formative or summative purposes. These reports, however, vary in several aspects including the number of required encounters, background of the raters, and the format of the evaluation form. Some of these studies have targeted issues such as psychometric properties, educational

Practice points

- The mini-CEX can be used in both undergraduate and postgraduate training programs with reasonable validity and reliability.
- Although can be used for summative purposes, by facilitating meaningful feedback and its antecedent favorable educational consequences, the mini-CEX is especially suitable for formative assessment.
- Proper implementation process to ensure psychometric and educational properties while maintaining acceptability and feasibility should be adopted.

consequences, and users'
our scoping search, we
reviews. Some of them
other workplace-based
et al. 2009; Miller and
Pelgrim et al. 2011), but

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MEDICAL TEACHER
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AMEE GUIDE

Keeping motivation on track by metamotivational knowledge: AMEE Guide No. 160

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ABSTRACT

This AMEE guide seeks to improve the metamotivational knowledge of health professions educators as well as students. We present key models and frameworks of *Metamotivation*, identify several motivation regulation strategies and their measurement tools, and propose applications for health professions education (HPE). Since our work is grounded on evidence from the field, we include new findings about motivation regulation to encourage further exploration. Although much of the research on *Metamotivation* has been done outside the field of medical education, we share our six years of research experience and findings within the field to inspire others to replicate and expand.

KEYWORDS

Metamotivation; motivation regulation strategies; metamotivational knowledge

Introduction

Learners in the health professions struggle to learn all they must learn in relatively short time blocks, always with looming summative examinations. Their learning is frequently challenged by inadequate study habits, stressful encounters with patients with life-threatening conditions, their own personal and family issues, high stake exams, and other expectations of educational systems. Educators who design curricula and instructional methods and advise and counsel learners for improving their learning, can use our findings on *Metamotivation* to discover new regulation strategies and advance this domain of inquiry.

Metamotivation includes procedures through which students monitor, control, and manage the quantity and quality of their academic motivation (Miele and Scholer 2018; Miele et al. 2020). In addition, motivation regulation strategies are defined as activities through which individuals act purposefully to initiate, maintain, or enhance their desire to begin and complete a specific activity or goal (Wolters and Benzon 2013). Students try to achieve such regulation by consciously regulating or controlling their motivational processes. All adapted thoughts, behaviors influencing their choices, and effort for persistence are considered as motivation regulation (Kim et al. 2018).

Motivation regulation, from the perspective of social cognitive theories, is a component of self-regulated learning (Wolters 2003). Students regulate their type and extent of motivation by using various strategies. For example, Wolters introduced the following three facets to the regulation of motivation: first, the meta-level understanding of the need for regulation of motivation; second, the ability

Practice points

- Motivation regulation frameworks and models, outside the field of HPE, help researchers to design viable studies, appropriate interventions and context-based models.
- Motivation regulation strategies are similar to vaccines and can protect students against factors that threaten motivation.
- Metamotivational Strategies in Medical Students Questionnaire (MSMQ) with appropriate validity and reliability evidence can be used to measure motivation regulation strategies among medical and other health professions students.

task, incorporating feedback as the learner adapts the motivation to the task; Third, the conscious effort of the individual to intervene and control motivation (Pintrich 2004a).

We feel that learners who invest in learning about metamotivation and practice its regulation strategies are equip-

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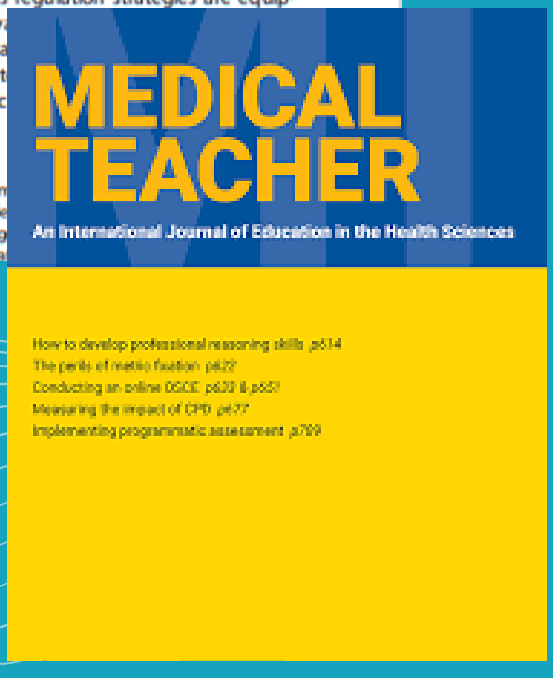

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MEDICAL TEACHER
Taylor & Francis

AMEE GUIDE

The lecture-free curriculum: Setting the stage for life-long learning: AMEE Guide No. 135

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ABSTRACT

In this AMEE Guide we propose that instruction in health sciences education transform to 'lecture-free.' We present rationale for this proposal, guidance on approaches and strategies to achieve the goal, likely challenges, and what we consider the value-added outcomes. We are supported by a confluence of factors: advances in the science of learning *and* the learning of science and clinical reasoning, incontrovertible evidence that active and engaged learning strategies have better outcomes, current and emerging technology infrastructure in and out of the classroom, and best-practice instructional design.

KEYWORDS

Curriculum; instructional design; methods; curriculum infrastructure; feedback

Rationale – *why change that which we have used for centuries?*

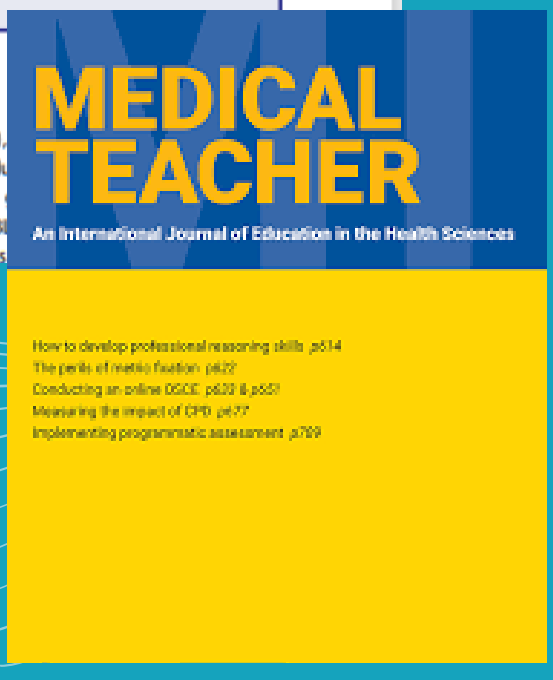
The impetus for change to lecture-free curricula at our two institutions began in 2002 at Wright State University Boonshoft School of Medicine (BSOM) and 2011 at Tehran University School of Medicine (TUMS). BSOM began to use Team-Based Learning (TBL) in 2002 and completed the transformation to a lecture-free curriculum in summer 2017. It is a 4-year M.D. degree granting school that requires a Bachelor's degree for admission and accepts 120 students each year. It is a community-based medical school, which means it has no single academic medical center for its clinical education programs, but rather uses collaborative alliances for teaching with all health care facilities in the southwest Ohio region of the US. Tehran University of Medical Sciences (TUMS), the oldest and largest medical university in Iran started using TBL as a core instructional strategy in their new curriculum in 2011, and, as of 2020, about 30% of its classroom time is lecture-free with the remainder being interactive within a lecture structure (Hejri et al. 2018). It has transformed some of its classrooms into 'active learning' spaces and continues to transition to a 'lecture free' status. For both of our schools, positive student feedback about TBL helped drive faculty to reduce lecture time because the academic outcomes had improved and students attended and were engaged in their learning, something that was not happening in lectures.

The center point of our rationale is that lecturing as a 'strategy' for teaching in the health science education is a colossal misfit with what we know now about how students learn, in general, and how they learn the science and biomedical science needed for clinical reasoning. Persistence of lecture is deeply rooted in a tradition that

and Hamdy 2013, p. e1567),
feel is their purpose as edu
had almost twenty years of
student endorsement of TBL
develop additional strategies

Practice points

- The science of learning supports eliminating lectures, replacing them with learning sessions that incorporate retrieval-based practice, elaborative interrogation, self-explanation and metacognition.
- Overall curriculum design should emphasize spaced repetition and interleaving of the content. The use of frequent low-stakes testing allows for faculty and students to better understand what students know and don't know.
- Although today's learners prefer watching videos, they will read in preparation for active learning in the classroom. In planning the assignments, one needs to keep the amount of time required in consideration, as if unrealistic, learners will quickly abandon reading.
- Peer Instruction, Team-based Learning, and Problem-based learning can be used together synergistically and are good choices for student mastery of biomedical and clinical sciences.
- Transforming to 'lecture-free' is challenging, but necessary to advance medical education and to best educate students for a career that requires life-long learning.



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SELF-REGULATION

Using multiple self-regulated learning measures to understand medical students' biomedical science learning

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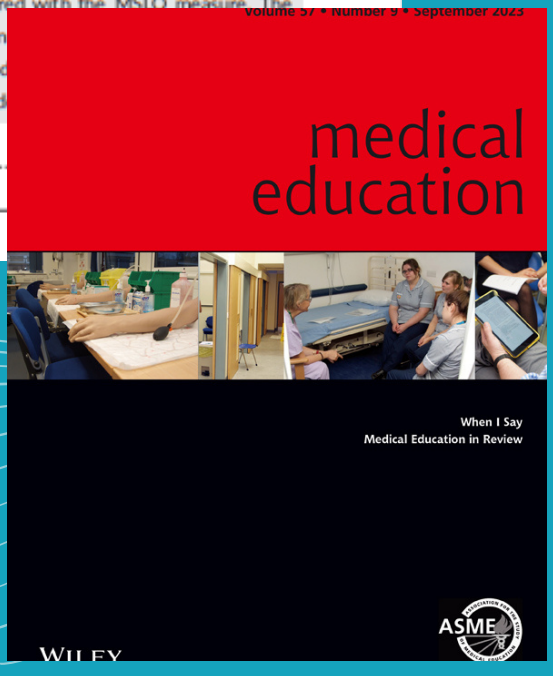
Abstract

Context: Understanding self-regulated learning (SRL) is complicated due to the different measures used to identify the key SRL processes. There is a growing trend in applying event measures of SRL (microanalysis and trace) but aptitude measures (questionnaires) continue to be widely used in medical education. A major concern is whether aptitude measures are a valid approach to capture the dimensions of SRL processes. This study examined correlations between SRL microanalysis, SRL trace and the Motivated Strategies for Learning Questionnaire (MSLQ) and how these measures were associated with biomedical science performance.

Methods: An SRL microanalysis assessment interview was administered to 76 first-year medical students individually when performing a biomedical science learning task. All written materials by students were collected for further trace analysis. Students completedan MSLQ 2 weeks before completing their biomedical science course. Correlation analyses were used to determine the correlations between the three SRL assessment measures. Bivariate and multiple analyses were conducted to compare students on different course or task performance using the three SRL assessment measures.

Results: Microanalytic metacognitive monitoring ($\kappa = 0.30$, $P < .001$) and causal attributions ($\kappa = 0.17$, $P = .009$) had statistically significant correlations with use of the SRL trace strategy. MSLQ self-efficacy correlated with microanalytic self-efficacy ($r = .39$, $P = .001$). Bivariate tests showed that microanalytic metacognitive monitoring, causal attributions and adaptive inferences, and SRL trace strategy use had significant associations with task performance ($P < .05$). Microanalytic self-efficacy, metacognitive monitoring and causal attributions, SRL trace strategy use and MSLQ self-efficacy had significant associations with course performance ($P < .05$). Measures of use of the SRL trace strategy and MSLQ subscales did not show significant associations with task and course outcomes in multiple analyses ($P > .05$).

Conclusions: Event measures, specifically SRL microanalysis, had greater associations with both task and course outcomes compared with the MSLQ measure. The SRL microanalysis is recommended for the assessm
learning. However, to fully understand medical stud
sessment approach that combines event and aptitud



Self-regulated learning processes of medical students during an academic learning task

Roghayeh Gandomkar,[1] Azim Mirzazadeh,[1,2] Mohammad Jalili,[1,3] Kamran Yazdani,[4] Ladan Fata[5] & John Sandars[6]

OBJECTIVES This study was designed to identify the self-regulated learning (SRL) processes of medical students during a biomedical science learning task and to examine the associations of the SRL processes with previous performance in biomedical science examinations and subsequent performance on a learning task.

METHODS A sample of 76 Year 1 medical students were recruited based on their performance in biomedical science examinations and stratified into previous high and low performers. Participants were asked to complete a biomedical science learning task. Participants' SRL processes were assessed before (self-efficacy, goal setting and strategic planning), during (metacognitive monitoring) and after (causal attributions and adaptive inferences) their completion of the task using an SRL microanalytic interview. Descriptive statistics were used to analyse the means and frequencies of SRL processes. Univariate and multiple logistic regression analyses were conducted to examine the associations of SRL processes with previous examination performance and the learning task performance.

RESULTS Most participants (from 88.2% to 43.4%) reported task-specific processes for SRL measures. Students who exhibited higher self-efficacy (odds ratio [OR] 1.44, 95% confidence interval [CI] 1.09–1.90) and reported task-specific processes for metacognitive monitoring (OR 6.61, 95% CI 1.68–25.93) and causal attributions (OR 6.75, 95% CI 2.05–22.25) measures were more likely to be high previous performers. Multiple analysis revealed that similar SRL measures were associated with previous performance. The use of task-specific processes for causal attributions (OR 23.00, 95% CI 4.57–115.76) and adaptive inferences (OR 27.00, 95% CI 3.39–214.95) measures were associated with being a high learning task performer. In multiple analysis, only the causal attributions measure was associated with high learning task performance.

CONCLUSIONS Self-efficacy, metacognitive monitoring and causal attributions measures were associated positively with previous performance. Causal attributions and adaptive inferences measures were associated positively with learning task performance. These findings may inform remediation interventions in the early years of medical school training.

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Discuss ideas arising from the article at www.mededuc.com discuss

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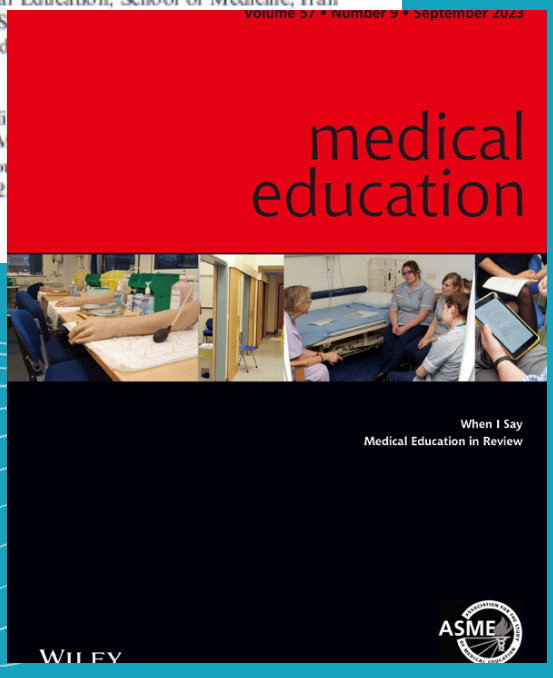

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MEDICAL TEACHER

Taylor & Francis

The development and validation of metamotivational strategies in medical students questionnaire

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ABSTRACT

Introduction: Understanding medical students' motivational regulation strategies is particularly salient to monitor their quality and quantity of motivation. This study aims to develop and validate a questionnaire to measure metamotivational strategies in medical students.

Methods: A Metamotivational Strategies in Medical Students Questionnaire (MSMQ) was developed by using the seven steps presented in 'developing questionnaires for educational research: AMEE Guide No. 87'. First, in a systematic search, related articles extracted and nine instruments were identified. Then, in a qualitative study, the metamotivational strategies of medical students were explained. In the next step, the identified strategies were conceptually compared with previous studies, and the MSMQ items were developed. Finally, expert validation, cognitive interviews, exploratory factor analysis, and reliability analysis were conducted.

Results: The MSMQ consisted of 7 factors and 28 items. CVI >0.79 in terms of relevance, clarity, and simplicity. In exploratory factor analysis, seven subscales explained 67.5% of the variance. Cronbach's alpha = 0.89. ICC = 0.76 – 0.87.

Conclusion: The MSMQ has reasonable psychometric properties, with adequate internal reliability and strong evidence of structural validity. However, further validation in other settings applying various psychometric methods is recommended.

KEYWORDS
Metamotivational strategies; medical students; regulation of motivation; development of questionnaire

Introduction

Motivation is defined as one of the most important components of learning (Pintrich et al. 2000; Zimmerman 2000; Winne 2001), and lack of motivation is a common concern that learners experience at all levels of education (Zimmerman 2000). Although there is considerable evidence on motivation as an independent and dependent variable and the factors that affect students' academic motivation, there is a paucity of evidence on the active role of learners in controlling their own motivation (Miele et al. 2020).

According to Wolters, self-regulation of motivation is one of the key components in self-regulated learning (Wolters 2011). It involves the active effort of learners to maintain or improve their motivation (Wolters 2003). He describes motivational regulation as a conscious process in which learners are aware not only of the factors influencing their motivation, but also how they develop their motivation by manipulating their thoughts and actions (Wolters 1998). Wolters developed the motivational regulation strategies questionnaire and identified five strategies (Wolters 2003). Although Wolters in his first paper stated that more studies are needed to identify more motivational regulation

Practice points

- Medical students use a wide range of strategies to regulate their academic motivation.
- Evidence of validity and reliability of the Metamotivational Strategies in Medical Students Questionnaire indicates that this questionnaire can be used in medical education contexts.

frequently in various studies (Trimble 2005; Cooper and Corpus 2009; Samadi and Davaii 2012; Smit et al. 2017).

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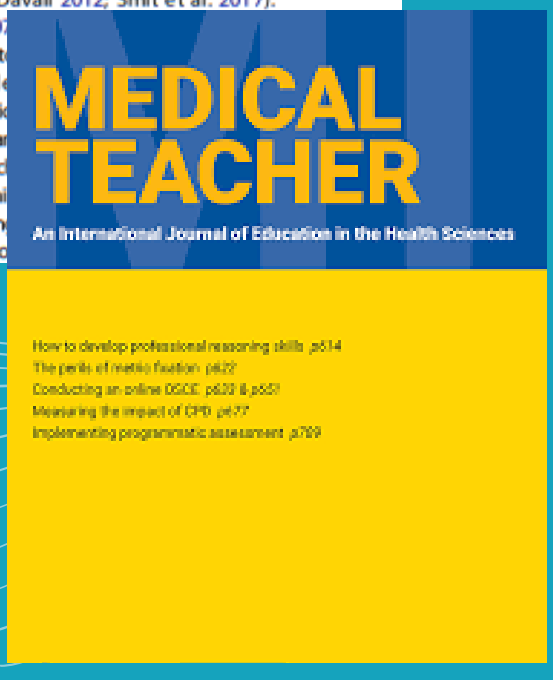

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MEDICAL TEACHER
Taylor & Francis

Uncover it, students would learn leadership from Team-Based Learning (TBL): The effect of guided reflection and feedback

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[a]Department of Medical Education, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran; [b]Iran Health Professions Education Research Center, Tehran University of Medical Sciences, Tehran, Iran; [c]Wright State University Boonshoft, School of Medicine, Dayton, OH, USA; [d]Veterans Health Administration, National Center for Organization Development, Cincinnati, OH, USA; [e]Department of Biostatistics, School of Public Health, Iran University of Medical Sciences, Tehran, Iran; [f]Clinical Trial Center (CTC), Tehran University of Medical Sciences, Tehran, Iran; [g]Department of Anatomy, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran; [h]Epidemiology and Biostatistics Department, School of Public Health, Knowledge Utilization Research Center, Tehran University of Medical Sciences, Tehran, Iran

ABSTRACT

Context: Little is known about best practices for teaching and learning leadership through Team-Based learning™ (TBL™) with medical students. We hypothesized that guided reflection and feedback would improve shared leadership and shared leadership capacity, and enhance team decision quality in TBL teams. We used the Kolb experiential learning theory as the theoretical framework.

Method: The study was conducted at Tehran University of Medical Sciences. Three TBL sessions with 206 students (39 teams) participated in the study. Using a quasi-experimental design, one batch received guided reflection and feedback on their team leadership processes ($n = 20$ teams) and the other received only TBL ($n = 19$ teams). Observers measured shared leadership using a checklist. Shared leadership capacity was measured using a questionnaire. Scores on a team application exercise were used to assess quality of team decisions.

Results: Evidence did not support our first hypothesis that reflection and feedback enhance shared leadership in TBL teams. Percentages of teams displaying shared leadership did not differ between intervention and control groups in sessions 1 ($p = 0.6$), 2 ($p = 1$) or 3 ($p = 1$). The results did not support the second hypothesis. We found no difference in quality of decision making between the intervention and control groups for sessions 1 ($p = 0.77$), 2 ($p = 0.23$), or 3 ($p = 0.07$). The third hypothesis that the reflection and feedback would have an effect on shared leadership capacity was supported ($T = -8.55$, $p > 0.001$ adjusted on baseline; $T = -8.55$, $p > 0.001$ adjusted on gender).

Discussion and conclusion: We found that reflection and feedback improved shared leadership capacity but not shared leadership behaviors or team decision quality. We propose medical educators who apply TBL, should provide guided exercise in reflection and feedback so that students may better understand the benefits of working in teams as preparation for their future roles as leaders and members of health care teams.

Introduction

Medical students are expected to be knowledgeable of the medical sciences and to assume responsibility as leaders in health care teams (Swing 2007; Mirzazadeh et al. 2014). Although medical students focus on learning course content to pass numerous qualifying exams, learning leadership skills is also crucial for their future roles. TBL uses authentic problem-solving in teams to promotes a combination of learning and application of content as well as collaboration skills (Parmelee & Michaelsen 2010; Parmelee et al. 2012). We believe that in the TBL setting, students experience shared leadership and important group processes but without a structured opportunity to reflect upon these processes. We apply the reflection framework, based on Kolb's reflection thinking model, in the TBL setting. His theory is an important tool to explain how individuals learn from experience (Kolb et al. 2001). The concept of experiential learning, suggests stimulating student thinking

Practice points

- Medical students are primarily focused on mastering the biomedical science in a TBL session. However, adding structured reflection and feedback on leadership improves their awareness of leadership and identity to become team leaders and willingness to share leadership and collaborate as followers.
- TBL appears to create an environment supporting shared leadership.
- Medical educators w
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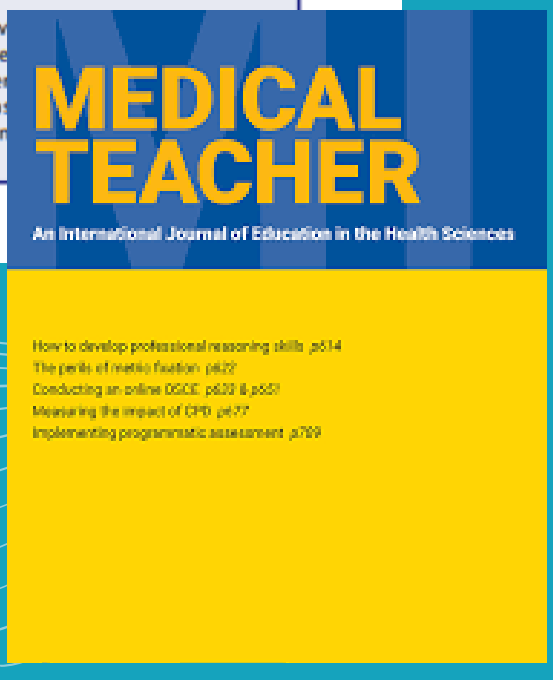

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Developing low-achieving medical students' self-regulated learning using a combined learning diary and explicit training intervention

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ABSTRACT

Introduction: The development of self-regulated learning (SRL) is an essential educational component of remediation for low-achieving students. The aim of this study was to design, implement, and evaluate a longitudinal SRL intervention combining both a structured learning diary and explicit SRL training in a cohort of low-achieving undergraduate medical students.

Materials and methods: A mixed methods quasi-experimental study was conducted, with a pretest–posttest study in the intervention group and comparison of the GPA and course grade of the intervention group with a historical comparison group. A questionnaire and focus group explored the participants' perceptions about the intervention.

Results: The SRL scores (total and rehearsal, organization, critical thinking, metacognitive regulation, time management and environment management) and course grade of participants were significantly improved in the intervention group. The course grade of participants was significantly higher than the comparison group but the GPA was not significantly different. Overall, the participants were positive about the intervention.

Conclusions: This study was the first in medical education to evaluate the effectiveness and user acceptability of an SRL intervention that combined a structured learning diary and explicit SRL training in low-achieving medical students. Further research is recommended in different contexts and with larger number of students.

KEYWORDS
Diary; self-regulated learning; low-achieving medical students; intervention

Introduction

A small number of medical students do not meet the required achievement criteria during their education. Supporting these students through academic remediation in their early years is a major priority for educators since these students are more likely to be at risk of failure in their subsequent training (Gonnella et al. 2004; Cleland et al. 2008; Salem et al. 2016) and also their medical practice as a doctor (Papadakis et al. 2006). Research has highlighted that self-regulated learning (SRL) is one of the most important factors that contribute to academic achievement (Lucieer et al. 2016). Low-achieving medical students demonstrate less use of key SRL processes compared with high-achieving students (Artino et al. 2011, 2014; Gandomkar et al. 2016; Chang et al. 2021; Foong et al. 2021; Versteeg et al. 2021). Importantly, research also suggests that effective remediation requires a component to develop the learners' SRL (Cleland et al. 2013) but a challenge for educators is how to provide this SRL remediation

Practice points

- Developing self-regulated learning (SRL) is an essential educational component of remediation
- Learning diaries have been used for developing SRL and improving academic performance in non-health professions education contexts
- Combined structured learning diaries and explicit SRL training have potential to be effective in developing SRL and improving academic performance for low-achieving undergraduate medical students.
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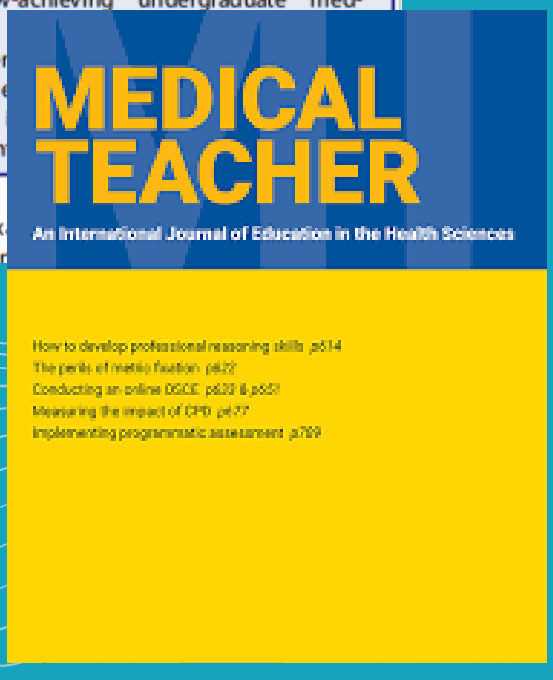

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Leadership Identity Development Through Reflection and Feedback in Team-Based Learning Medical Student Teams

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ABSTRACT

Problem: Studies on leadership identity development through reflection with Team-Based Learning (TBL) in medical student education are rare. We assumed that reflection and feedback on the team leadership process would advance the progression through leadership identity development stages in medical students within the context of classes using TBL. *Intervention*: This study is a quasi-experimental design with pretest–posttest control group. The pretest and posttest were reflection papers of medical students about their experience of leadership during their TBL sessions. In the intervention group, TBL and a team-based, guided reflection and feedback on the team leadership process were performed at the end of all TBL sessions. In the other group, only TBL was used. The Stata 12 software was used. Leadership Identity was treated both as a categorical and quantitative variable to control for differences in baseline and gender variables. Chi-square, *t* tests, and linear regression analysis were performed. *Context*: The population was a cohort of 2015–2016 medical students in a TBL setting at Tehran University of Medical Sciences, School of Medicine. Teams of four to seven students were formed by random sorting at the beginning of the academic year (intervention group $n = 20$ teams, control group $n = 19$ teams). *Outcome*: At baseline, most students in both groups were categorized in the Awareness and Exploration stage of leadership identity: 51 (52%) in the intervention group and 59 (55%) in the control group: uncorrected $\chi^2(3) = 15.6$, design-based $F(2.83, 108) = 4.87$, $p = .003$. In the posttest intervention group, 36 (36%) were in exploration, 33 (33%) were in L-identified, 20 (20%) were in Leadership Differentiated, and 10 (10%) were in the Generativity. None were in the Awareness or Integration stages. In the control group, 3 (20%) were in Awareness, 56 (53%) were in Exploration, 35 (33%) were in Leader Identified, 13 (12%) were in Leadership Differentiated. None were in the Generativity and Integration stages. Our hypothesis was supported by the data: uncorrected $\chi^2(4) = 18.6$, design-based $F(3.77, 143) = 4.46$, $p = .002$. The mean of the leadership identity in the pretest, intervention group equaled 1.93 ($SD = 0.85$) and the pretest, control group mean was 2.36 ($SD = 0.86$), $p = .004$. The mean of the posttest, intervention group was 3.04 ($SD = 0.98$) and posttest, control group mean was 2.54 ($SD = 0.74$), $T = -4.00$, design $df = 38$, $p < .001$, and adjusted on baseline and gender $T = -8.97$, design $df = 38$, $p < .001$. *Lessons Learned*: Reflection and feedback on the team leadership process in TBL advances the progression in stages of leadership identity development in medical students. Although the TBL strategy itself could have an impact on leadership identity development, this study demonstrates that when a reflection and feedback on leadership intervention are added, there is much greater impact.

KEYWORDS
team-based learning; reflection and feedback; leadership identity development

Introduction

In recent years, accrediting bodies have called for the inclusion of leadership, teamwork, and reflective skills at all levels of medical education. These calls come in response to a growing literature in medical education suggesting that teamwork, leadership, and reflective skills may reduce medical er... care.[1] These teamwork sk... learning necessary to imp...

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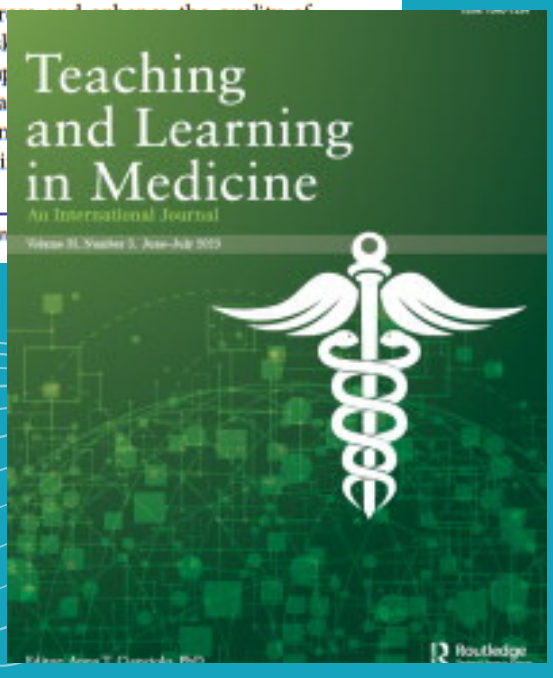

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BMC Medical Education

RESEARCH Open Access

Development and validation of conflict management attitude questionnaire for medical students

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Abstract

Background: Medical students should effectively manage conflicts in teamwork and communication with other team members. This study aimed to develop and validate a tool to evaluate attitude of medical students and physicians toward conflict management.

Method: A multi-step process was employed to develop and validate a Conflict Management Attitude Questionnaire (CMAQ) based on the steps recommended in AMEE Guide No. 87. First, the initial items were obtained from the literature review and focus group. After cognitive interviews with the medical students and revision of the questionnaire, content validity was performed by experts. The construct validity and reliability of the questionnaire were assessed using exploratory Factor Analysis (EFA) and Cronbach's alpha coefficient, respectively.

Results: This multi-step process resulted in a 12-item, five-point Likert-type questionnaire with satisfactory construct validity. Exploratory factor analysis revealed three factors, comprising the four items from the "perceived interactions in conflict management" subscale loading on the first factor, and five items from the "perceived value of learning conflict management" subscale loading on the second factor, along with three items from the "perceived application of conflict management" subscale loading on the third factor. All subscales described 56.48% of the variance. Validation results showed that Content Validity Index (CVI) and Content Validity Ratio (CVR) were greater than 0.75. Cronbach's alpha coefficient was 0.791.

Conclusion: This study showed that CMAQ has valid evidence for assessing the attitude of medical students toward conflict management with favorable psychometric properties and strong evidence of construct validity. However, due to the lack of evidence on any specific questionnaire to evaluate the attitude towards conflict management, future studies should conduct a confirmatory investigation regarding other aspects of medical students' attitudes toward conflict management.

Keywords: Conflict management, Psychometric, Medical students, Development of questionnaire

Introduction

Conflict arises as a result of the lack of coordination or incompatibility among individuals due to differences in their needs, beliefs, attitudes, values, goals, ideas, or interests [1, 2]. Interpersonal and team conflicts are the most common types o
care team members [3

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BMC Medical Education

RESEARCH Open Access

Insights on my future job: implementing near-peer shadowing program for operating room freshmen

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Abstract

Background: As a main challenge in paramedical faculties of medical sciences, freshmen lose interest in their academic field of study and then job motivation. Lack of developed knowledge about their academic field and unfamiliarity with their future job's tasks and roles contribute to freshmen's job motivation loss. Various interventional programs have been implemented to improve students' job motivation by familiarizing them with their future job's duties and responsibilities.

Methods: This was one-group pretest-posttest design study in 2019–2020. Students grouped into pairs of a freshman (shadowee) with a senior (shadower) in a clinical setting during shadowing program. This program helps freshmen to comprehend and discover realities of their academic field and can help them change their perspectives regarding their future job's duties and responsibilities. The shadowees' main task was reflective observation on operating room events and interactions and to be active in the program, several tasks e.g., how to wear gloves, guns, and disinfect equipment were assigned to them exclusively under the supervision of senior students. The Hackman and Oldham's Job Diagnostic Survey (JDS) questionnaire and a novel Job Motivation Survey (JMS) questionnaire were distributed among participants.

Results: Fifty freshmen majoring in operating room participated in the shadowing program from November 2019 to January 2020. Before and after the program, they completed Hackman and Oldham's job diagnostic survey and researcher-made job motivation survey questionnaires. Results were indicative of a significant difference in job diagnostic survey questionnaire score, where overall pre-test and post-test scores before and after the intervention were 57.78 (±9.78) and 68.58 (±5.02), respectively; the score difference was statistically significant ($P < 0.001$). Moreover, the overall pre-test and post-test scores of the job motivation survey questionnaire were 25.16 (± 9.75) and 39.80 (±5.18), respectively; this score difference was statistically significant ($P < 0.001$).

Conclusion: Shadowing program improved freshmen's realistic perception of their future job's duties and responsibility, and hence enhancing their job motivation and job recognition. As future work, in various disciplines, further studies need to evaluate the impact of such interventional programs in providing early insights for freshmen as well as in providing guidance on their plans for education, and future job.

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BMC Medical Education

RESEARCH Open Access

Students' perception of educational environment based on Dundee Ready Education Environment Measure and the role of peer mentoring: a cross-sectional study

Shadab Behkam[1], Amirhossein Tavallaei[1], Nastaran Maghbouli[2], Mahboobeh Khabaz Mafinejad[3] and Jemal Haidar Ali[4*]

Abstract

Objective: The curricular reform at Tehran University of Medical Sciences (TUMS), Iran, has been implemented since 2011 when peer mentoring program started. The program is believed to have a crucial role in students' perception of the educational environment (EE). We aimed to determine how students perceive the educational environment and compared the mentees and non-mentees' perception of EE.

Methods: A cross-sectional descriptive study was conducted among 190 first-year medical students enrolling at Tehran University of Medical Sciences from March to September 2019. A questionnaire was used to collect information on students' age, gender, marital status, dormitory status, and their mentoring status including satisfaction of mentor-mentee relationship. The study also employed Dundee Ready Education Environment Measure (DREEM). The collected data were then entered and analysed using SPSS version 20. To compare the perception of EE between mentees and non-mentees, we used independent t-test.

Results: The mean (SD) for total DREEM score for EE was 144.1 (19.3), which signifies a more positive than negative educational environment perception. Nonetheless, the mean scores of total DREEM was not significantly different between students with or without mentors ($P=0.390$). The overall mean score for student perceptions of learning for mentees was 32.47 (4.5) while for those without a mentor, the score was 31.70 (4.9) ($P=0.491$). The items concerned with "emphasizing factual learning" and "teacher-based teaching" were rated the least. The item "having an appropriate support system" was scored significantly different between students with or without mentors ($P=0.009$).

Conclusions: Since having an appropriate support system was significantly different between groups, we suggest curriculum designers focus on the above-mentioned issue under caption for improvement during the reform programs.

Keywords: Curriculum, Mentoring, Medical students, Reform, Iran

Background

Educational environment (EE) is a complex concept consisting of diverse physical places, contexts, and cultures in which students experience learning activities [1]. Worldwide, medical educators are trying to recognize EE's components and their interactions to reform

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RESEARCH Open Access

Developing and validating a national set of standards for undergraduate medical education using the WFME framework: the experience of an accreditation system in Iran

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Abstract

Background Defining standards is the first step toward quality assurance and improvement of educational programs. This study aimed at developing and validating a set of national standards for the Undergraduate Medical Education (UME) program through an accreditation system in Iran using the World Federation for Medical Education (WFME) framework.

Methods The first draft of standards was prepared through consultative workshops with the participation of different UME program stakeholders. Subsequently, standards were sent to medical schools and UME directors were asked to complete a web-based survey. The content validity index at the item level (I-CVI) was computed using criteria including clarity, relevance, optimization and evaluability for each standard. Afterward, a full-day consultative workshop was held and a wide range of UME stakeholders across the country (n = 150) discussed the survey results and made corrections to standards.

Results Analysis of survey results showed that relevance criteria had the best CVI as only 15 (13%) standards demonstrated CVI < 0.78. More than two-thirds (71%) and a half (55%) of standards showed CVI < 0.78 for optimization and evaluability criteria. The final set of UME national standards was structured in 9 areas, 24 sub-areas, 82 basic and 40 quality development standards, and 84 annotations.

Conclusions We developed and validated national standards as a framework to ensure the quality of UME training with input from UME stakeholders. We used WFME standards as a benchmark while addressing local requirements. The standards and participatory approach to developing standards may guide relevant institutions.

Keywords Standard, Undergraduate medical education, WFME

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RESEARCH Open Access

The role of motivational components in metamotivational monitoring in medical students: a mixed method study

Ali Norouzi[1], Dean Parmelee[2], Mohammad Shariati[3], Saiideh Norouzi[4] and Maryam Alizadeh[5*]

Abstract

Background In metamotivational monitoring, students try to identify the declined motivational component in order to regulate their motivation. There is scarcity of evidence on which motivational components are targeted by the medical students when they use each motivational regulation strategies. This study aims were identifying motivational components in motivational regulation process, developing a measurement tool and, testing the predictive relationship between the motivational components and motivational regulation strategies.

Methods This exploratory sequential design mixed method study is part of a project has been started from 2018 with medical students at Tehran University of Medical Science. First, in a qualitative study conducting a semi-structured in-depth interview, the motivational components were explored. The interviews continued until saturation of data. Then, in a psychometric study the validity and reliability evidence of questionnaire obtained. In the quantitative study, applying the convenience sampling method, 508 students completed the questionnaires. Predictive relation between the motivational regulation strategies and motivational components was assessed utilising Structural Equation Modelling. Path coefficients, T-Value, and R^2 index were reported by SmartPLS software.

Results In the Exploratory Factor Analysis of Motivational Components Questionnaire (MCQ), 6 factors were discovered that explained 74% of the total variance. All paths in seven models of SEM showed a T-Value above 1.96 that means there is a significant correlation between all strategies and components. In examining the predictive relationships, each of the four components of self-efficacy, intrinsic value, self-relevant value and promotion value were specifically predicted by two motivational regulation strategies.

Conclusions Evidence of validity and reliability of the MCQ indicates that this questionnaire can be used in medical education contexts. Health Profession Educators can improve the academic motivation of students by identifying one or more declined motivational component and teaching specific motivational regulation strategies. It is recommended to hold training courses on motivational regulation strategies for medical school faculty, study-skills advisors, and students.

Keywords Motivation, Self-regulation, Medical student, Medical education

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Reflection on near-peer shadowing program: impact on operating room student's perception of their future profession

Mafinejad Mahboobeh Khabaz[1], Ebrahimpour Fatemeh[2], Sayarifard Azadeh[3], Shahbazi Fatemeh[4,5*] and Larry Gruppen[6]

Abstract

Background: Reflection is a key element in learning from observation and experience of future profession's roles and responsibilities in clinical encounters. Moreover, reflection helps students cope with the challenges, complexities, and uncertainties of professional development. Students' written reflections on clinical exposure offer valuable information, and their analysis provides instructors with invaluable insight into students' experiences. This study evaluated Operating Room students' written reflections on their first clinical exposure experiences towards their future profession through the shadowing program.

Methods: This study was a qualitative analysis on Operating Room freshmen's reflections in the undergraduate program of Zahedan and Zabol University of Medical Sciences in Iran. After the shadowing program, all participants were asked to write an unstructured written reflection, and these fifty written reflections were de-identified and independently analyzed using the thematic analysis approach.

Results: Qualitative analysis extracted 10 subthemes and four main themes including (i) Moving towards the guiding realities of future profession, (ii) Discovering milestones of realizing professional identity, (iii) Managing the emotions affecting the perception of future profession's desirability, and (iv) Excellence in professional growth and development.

Conclusion: Reflecting on the experience of the shadowing program, the participants described being in the OR environment as a stimulating and valuable learning opportunity. Moreover, this experience helped improve their perception of future profession's realities, as well as initiate realization of professional identity and planning for professional developments.

Keywords: Reflection, Operating Room Technicians, Students, Perception, Qualitative Research

Background

Transition from the preclinical to clinical phase is well recognized as a difficult and stressful period for many students [1–3]. Evidence indicated that many Operating Room (OR) students were not prepared for entering into the clinical environment in their preclinical phase. Windish et al. (2004) argued that educational programs were not sufficient to meet learners' future needs in clinical settings [4]. Furthermore, most curricula do not provide

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Inter-cultural and cross-cultural communication through physicians' lens: perceptions and experiences

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Abstract

Objectives: This study aimed to explore Swedish physicians' perceptions regarding physician-patient communication in an Iranian context and to obtain a deeper understanding of their lived experience when encountering Middle Eastern and Swedish patients in their daily work.

Methods: This is a multi-method study, including conventional content analysis in combination with phenomenological methodology. A triangulation approach to data collection and analysis was used. Serving the purpose of the study, twelve Swedish physicians with previous experience of Middle Eastern patients were purposely selected to participate in the study. They watched a video showing simulated patient encounter in an Iranian context. The video served as a trigger. Semi-structured interviews were conducted focusing on the participants' perceptions of the video and their lived experiences. Constant comparative analysis was used for a deep understanding of the data.

Results: The core themes were cultural diversity, doctor-centeredness, and patient-centeredness. Cultural diversity was a convergent theme and included trust, interpersonal interaction, context, and doctor dominancy. Patient-centeredness and doctor-centeredness were divergent themes and included doctors' authority, equity, the experience of illness, and accountability.

Conclusions: The participants confirmed large cultural differences in doctor-patient communication when encountering Iranian and Swedish patients. Inter-cultural and cross-cultural competencies were made visible. To be able to appreciate other cultures' health values, beliefs, and behaviors, increased cultural competence in health care is of importance.

Keywords: Doctor-patient communication, physicians, cross-cultural, inter-cultural, Iran, Sweden, Middle East

Introduction

Cultural competency among health care professionals has become a significant patient safety issue, owing to increasing immigration rates and health problems that are often labeled as "migration-related stresses among immigrants."[1] Cultural competency has been defined as an understanding of a culture's shared beliefs, norms, and values, including their thoughts, styles of communication, ways of interacting, views which we can find meanin
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Introducing a model for optimal design of sequential objective structured clinical examinations

Sara Mortaz Hejri[1] · Kamran Yazdani[2] · Ali Labaf[3] · John J. Norcini[4] · Mohammad Jalili[5]

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Abstract In a sequential OSCE which has been suggested to reduce testing costs, candidates take a short screening test and who fail the test, are asked to take the full OSCE. In order to introduce an effective and accurate sequential design, we developed a model for designing and evaluating screening OSCEs. Based on two datasets from a 10-station pre-internship OSCE and considering three factors, namely, the number of stations, the criteria for selecting the stations, and the cut-off score, several hypothetical tests were proposed. To investigate their accuracy, the positive predictive value (PPV), the pass rate, and the negative predictive value (NPV) were calculated. Also, a "desirable" composite outcome was defined as PPV = 100 %, pass rate ≥50 %, and NPV ≥25 %. Univariate and multiple logistic regression analyses were conducted to estimate the effects of independent factors on the occurrence of the desirable outcome. In half of the screening tests no false positive result was detected. Most of the screening OSCEs had acceptable levels of pass rate and NPV. Considering the desirable composite outcome 20 screening OSCEs could have successfully predicted the results of the corresponding full OSCE. The multiple regression analysis indicated significant contributions for the selection criteria (p values = 0.019) and the cut-off score (p values = 0.017). In order to have efficient screening OSCEs with the lowest probability of the error rate, careful selection of stations with high values of

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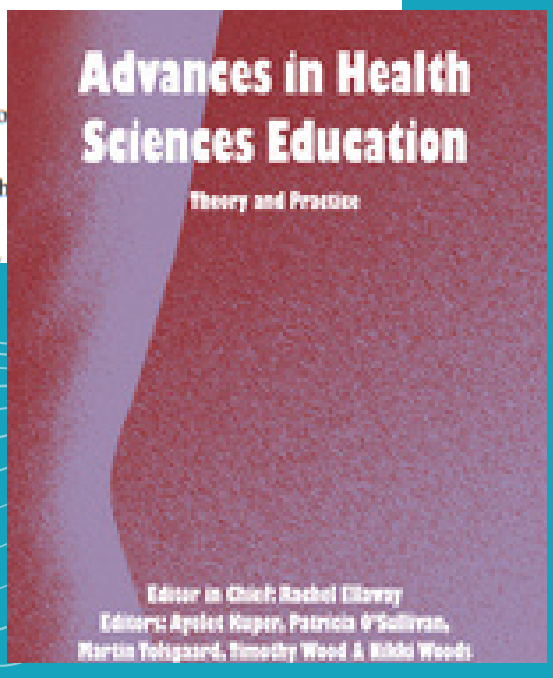

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Expectations for PhDs in health professions education: an international EPA-framed, modified Delphi study

Roghayeh Gandomkar[1,2] · Reza Zaeri[2] · Olle ten Cate[3]

Received: 17 December 2021 / Accepted: 11 June 2022

Abstract
Health professions education (HPE) has matured into field of study that employs and produces specialized educational scholars. Many academic institutions employ such scholars to support development and innovation in education. Simultaneously, the possibilities to obtain a PhD degree in HPE are expanding. Clarity in the expectations that such a degree brings along can be useful for scholars, employers and institutions. Anticipating that the views of what a PhD in HPE is or should be can vary between institutions, cultures and countries, we conducted an international Delphi study to identify EPAs for HPE PhDs. We used a framework of 24 EPAs resulted from a national consensus study in Iran as input to seek more generalized validity and a wider consensus of reasonably suitable activities. A three-round modified Delphi study was conducted with participation of 15 international experts. Final framework consisted of 17 relevant EPAs with a justification, specifications and limitations, and risks in case of failure per EPA (all had overall CVI > 0.8 for adequacy of description). Eleven EPAs were considered by the majority to be core to PhD training, 16 to be desirable for HPE PhDs as a capability to carry out without supervision, but the majority would trust current HPE PhDs to carry out only 5 of the 17 without supervision. The EPAs identified in this study arguably reflect the expectations of educators with a PhD degree in HPE. The framework has the potential to advance HPE training across countries and to inform personal development and employment decisions.

Keywords Delphi study · Entrustable professional activities · Health profession education · PhD

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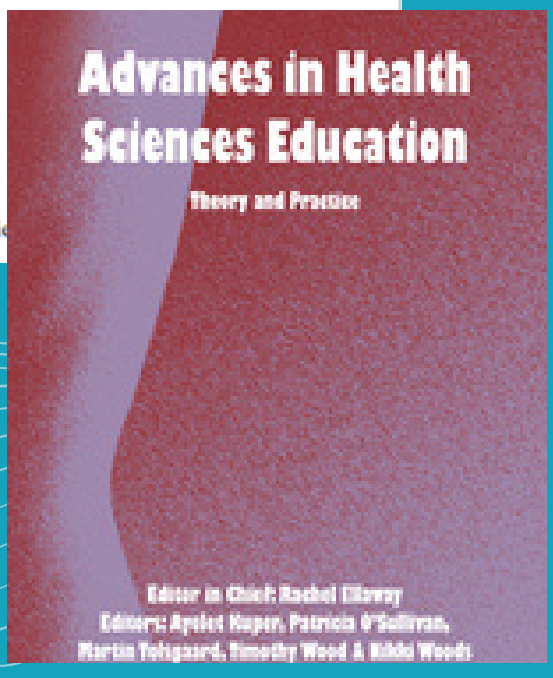

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RESEARCH

The potential of structured learning diaries for combining the development and assessment of self-regulated learning

Zahra Zarei Hajiabadi[1] · John Sandars[2] · John Norcini[3] · Roghayeh Gandomkar[1,4]

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Abstract

Structured Self-Regulated Learning (SSRL) diaries have the potential for combining the development and assessment of a student's SRL processes over time. The aim of this study was to evaluate the extent to which an SSRL diary can develop SRL and provide a reliable longitudinal assessment of SRL development in academically low-achieving undergraduate medical students. We conducted a quasi-experimental study with low-achieving medical students at Tehran University of Medical Sciences. The intervention was a weekly SSRL diary, with 21 items in two parts (before and after studying) that was integrated with weekly explicit SRL training. A repeated measures ANOVA was performed to assess the participants' SRL development across time. We conducted generalizability theory analysis in two designs; the first was to assess the reliability of the total diary score in assessing low-achieving medical students' SRL and the second was to assess the efficacy of the four-week intervention results in improving the low-achieving medical students' SRL. Each participant (n = 20) completed four SSRL diaries. There were significant positive changes during the intervention in the students' measures of total SRL, time estimation of study, time spent on study, concentration, elaboration, organization, self-monitoring, and self-evaluation. The absolute and relative generalizability coefficients for the first design, which indicates the reliability of the students' SRL scores, were 0.71 and 0.77. The absolute and relative generalizability coefficients for the second design, which presents the reliability of the improvement of students' SRL across time were 0.79 and 0.87. The results of this study suggest that SSRL diaries combined with explicit training can provide an effective and reliable method for combining the development and assessment of S
medical students' SRL over time.

Keywords Self-regulated learning · Diary · G theory · Intervention

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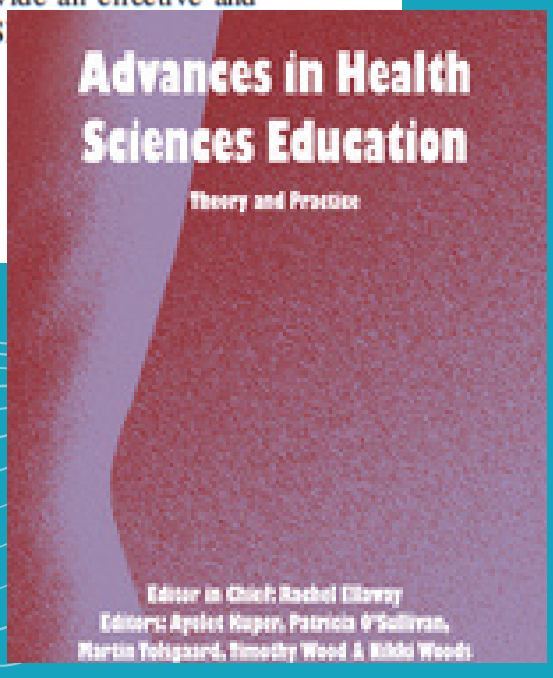

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