ORIGINAL ARTICLE

Exploring Factors Influencing Faculty Members' Teaching Motivation in the Era of Artificial Intelligence: An Explanatory Mixed-Methods Study from Birjand University of Medical Sciences

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Background: Faculty members' motivation for teaching plays a pivotal role in the quality of clinical education. This study aimed to identify factors influencing faculty members' teaching motivation in the era of AI.
Method: This explanatory mixed-methods study was conducted concurrently in 2025. In the quantitative phase, 72 faculty members or non-faculty instructors were selected using stratified random sampling, and data were collected using a researcher-made questionnaire. The content validity of the instrument was assessed using the Content Validity Ratio (CVR) and Content Validity Index (CVI), while its reliability was established using Cronbach's alpha. Quantitative data were analyzed using SPSS version 21 and the Friedman test. In the qualitative phase, 20 faculty members were selected through nested sampling, and data were collected using open-ended questions and semi-structured interviews. Qualitative sampling and data collection continued until data saturation was achieved and were analyzed using the inductive content analysis approach proposed by Elo and Kyngäs.
Results: Teaching motivation was influenced by individual, educational, organizational, and technological factors. The Friedman test revealed significant differences among the motivational dimensions ($p < .001$). Teaching competence (4.46 ± 0.44), reward and incentive systems (4.45 ± 0.59), and personal interest and motivation (4.44 ± 0.46) received the highest mean scores, whereas workload and responsibilities (3.77 ± 0.95) and educational policies and structures (3.90 ± 0.60) were rated lower. Qualitative findings highlighted the importance of teaching competence, fair rewards, positive student interaction, supportive environments, and the perceived capacity of AI tools to facilitate teaching.
Conclusion: The motivation of faculty members regarding teaching is multidimensional and influenced by individual, educational, organizational, and technological factors. Sustained engagement in teaching requires attention to competencies and the creation of supportive environments.
Keywords: Motivation; Artificial Intelligence; Medical Education; Teaching Competence

استكشاف العوامل المؤثرة على دافعية أعضاء هيئة التدريس للتدريس في عصر الذكاء الاصطناعي: دراسة تفسيرية ذات مناهج مختلطة من جامعة بيرجاند للعلوم الطبية

الخلفية: تلعب دافعية أعضاء هيئة التدريس نحو التدريس دوراً محورياً في جودة التعليم السريري. هدفت هذه الدراسة إلى تحديد العوامل المؤثرة على دافعية أعضاء هيئة التدريس للتدريس في ظل عصر الذكاء الاصطناعي.
الطريقة أجريت هذه الدراسة التفسيرية ذات المناهج المختلطة بشكل متزامن في عام ٢٠٢٥. في المرحلة الكمية، تم اختيار ٧٢ عضواً من هيئة التدريس أو مدرباً غير عضو في هيئة التدريس باستخدام أسلوب العينة العشوائية الطبقية، وجُمعت البيانات بواسطة استبانة أعدها الباحثون. تم تقييم صلاحية المحتوى للأداة باستخدام "نسبة صلاحية المحتوى" (CVR) و"مؤشر صلاحية المحتوى" (CVI)، بينما تم التحقق من الموثوقية باستخدام معامل "ألفا كرونباخ". حُللت البيانات الكمية باستخدام برنامج SPSS (الإصدار ٢١) واختبار فريدمان. وفي المرحلة النوعية، اختير ٢٠ عضواً من هيئة التدريس عبر أسلوب العينة المتداخلة (nested sampling)، وجُمعت البيانات باستخدام أسئلة مفتوحة ومقابلات شبه منظمة. استمرت عمليات اختيار العينة النوعية وجمع البيانات حتى الوصول إلى مرحلة تشبع البيانات، وحُللت باستخدام نهج تحليل المحتوى الاستقرائي الذي اقترحه "إيلو" و"كينغاس" (Elo and Kyngäs).
النتائج: تأثرت دافعية التدريس بعوامل فردية وتعليمية وتنظيمية وتقنية. وكشف اختبار فريدمان عن وجود فروق ذات دلالة إحصائية بين أبعاد الدافعية ($p < 001$). وسجلت كل من الكفاءة التدريسية (٤,٤٦ ± ٠,٤٤)، وأنظمة المكافآت والحوافز (٤,٤٥ ± ٠,٥٩)، والاهتمام والدافعية الشخصية (٤,٤٤ ± ٠,٤٦) أعلى متوسطات للدرجات، في حين جاءت تقييمات عبء العمل والمسؤوليات (٣,٧٧ ± ٠,٩٥) والسياسات والهياكل التعليمية (٣,٩٠ ± ٠,٦٠) في مستويات أدنى. وسلطت النتائج النوعية الضوء على أهمية الكفاءة التدريسية، والمكافآت العادلة، والتفاعل الإيجابي مع الطلاب، والبيئات الداعمة، والقدرة المتصورة لأدوات الذكاء الاصطناعي على تسهيل عملية التدريس.
الخلاصة: إن دافعية أعضاء هيئة التدريس تجاه التدريس متعددة الأبعاد وتتأثر بعوامل فردية وتعليمية وتنظيمية وتقنية. ويتطلب الحفاظ على المشاركة الفعالة في التدريس الاهتمام بالكفاءات وتوفير بيئات داعمة.
الكلمات المفتاحية: الدافعية؛ الذكاء الاصطناعي؛ التعليم الطبي؛ الكفاءة التدريسية

بررسی عوامل مؤثر بر انگیزش تدریس اعضای هیأت علمی در عصر هوش مصنوعی: یک مطالعه آمیخته تبیینی از دانشگاه علوم پزشکی بیرجند

زمینه و هدف: داشتن انگیزه تدریس در اعضای هیأت علمی برای ارتقاء کیفیت آموزش بالینی ضروری است. این مطالعه عوامل مؤثر بر انگیزه تدریس اعضای هیأت علمی در عصر هوش مصنوعی را بررسی کرد.
روش: این مطالعه آمیخته هم‌زمان در سال ۱۴۰۴ انجام شد. در بخش کمی ۷۲ عضو هیأت علمی یا مدرس غیر هیأت علمی با نمونه گیری تصادفی طبقه‌ای انتخاب و پرسشنامه محقق‌ساخته را تکمیل کردند. روایی با استفاده از نسبت روایی محتوا (CVR) و شاخص روایی محتوا(CVI) و پایایی با آلفای کرونباخ بررسی شد. داده‌ها با استفاده از SPSS نسخه ۲۱ و آزمون فریدمن تحلیل شدند. در بخش کیفی ۲۰ نفر با نمونه گیری هدفمند تودرتو انتخاب شدند. داده‌ها از طریق سؤالات باز و مصاحبه‌های نیمه‌ساختاریافته تا دستیابی به اشباع جمع‌آوری و با استفاده از تحلیل محتوای استقرایی بر اساس روش Elo و Kyngäs تحلیل شدند.
یافته‌ها: انگیزه تدریس تحت تأثیر عوامل فردی، آموزشی، سازمانی و فناورانه قرار داشت. آزمون فریدمن تفاوت معناداری را میان ابعاد انگیزشی نشان داد ($p < ۰۰۱$). شایستگی تدریس (۴/۴۶ ±۰/۴۴)، نظام‌های پاداش و تشویق (۴/۴۵ ±۰/۵۹) و علاقه و انگیزه فردی (۴/۴۴ ± ۰/۰۴۶) بالاترین میانگین را داشتند، حجم کار و مسئولیت‌ها (۳/۷۷ ± ۰/۹۵) و سیاست‌ها و ساختارهای آموزشی (۳/۹۰ ± ۰/۶۰) امتیاز پایین‌تری داشتند. یافته‌های کیفی بر شایستگی آموزشی، پاداش عادلانه، تعامل مثبت با دانشجویان، محیط‌های حمایتگر و ظرفیت ادراک‌شده ابزارهای هوش مصنوعی برای تسهیل تدریس تأکید کردند.
نتیجه گیری: انگیزه تدریس اعضای هیأت علمی چندبعدی است و تحت تأثیر عوامل فردی، آموزشی، سازمانی و فناورانه قرار دارد. تداوم مشارکت در تدریس مستلزم توجه به شایستگی‌ها و ایجاد محیط‌های حمایتگر است.
واژه های کلیدی: انگیزش؛ هوش مصنوعی؛ آموزش پزشکی؛ صلاحیت تدریس

مصنوعی ذہانت کے دور میں فیکلٹی ممبران کی تدریسی تحریک کو متاثر کرنے والے عوامل کی کھوج: برجند یونیورسٹی آف میڈیکل سائنسز سے ایک وضاحتی مخلوط طریقوں کا مطالعہ

پس منظر: تدریس کے لیے فیکلٹی ممبران کی حوصلہ افزائی طبی تعلیم کے معیار میں اہم کردار ادا کرتی ہے۔ اس مطالعے کا مقصد AI کے دور میں فیکلٹی ممبران کی تدریسی تحریک کو متاثر کرنے والے عوامل کی نشاندہی کرنا تھا۔
طریقہ: یہ وضاحتی مخلوط طریقوں کا مطالعہ ۲۰۲۵ میں بیک وقت کیا گیا تھا۔ مقداری مرحلے میں، ۷۲ فیکلٹی ممبران یا غیر فیکلٹی انسٹرکٹرز کو اسٹریٹیفائیڈ رینڈم سیمپلنگ کا استعمال کرتے ہوئے منتخب کیا گیا تھا، اور محقق کے تیار کردہ سوالنامے کا استعمال کرتے ہوئے ڈیٹا اکٹھا کیا گیا تھا۔ مواد کی درستگی کا تناسب مواد کی درستگی کا تناسب (CVR) اور مواد کی درستگی کا اشاریہ (CVI) استعمال کرتے ہوئے لگایا گیا، جبکہ اس کی وشوسنییتا Cronbach کے الفا کا استعمال کرتے ہوئے قائم کی گئی۔ SPSS ورژن ۲۱ اور فریڈمین ٹیسٹ کا استعمال کرتے ہوئے مقداری ڈیٹا کا تجزیہ کیا گیا۔ کوالیٹیو مرحلے میں، ۲۰ فیکلٹی ممبران کو نیسٹڈ سیمپلنگ کے ذریعے منتخب کیا گیا، اور اوپن اینڈڈ سوالات اور نیم ساختہ انٹرویوز کا استعمال کرتے ہوئے ڈیٹا اکٹھا کیا گیا۔ کوالیٹیو سیمپلنگ اور ڈیٹا اکٹھا کرنا اس وقت تک جاری رہا جب تک کہ ڈیٹا سیچوریشن حاصل نہ ہو جائے اور Elo اور Kyngäs کے تجویز کردہ انڈکٹو مواد کے تجزیہ کے طریقہ کار کا استعمال کرتے ہوئے تجزیہ کیا گیا۔
نتائج: تدریسی محرک انفرادی، تعلیمی، تنظیمی، اور تکنیکی عوامل سے متاثر تھا۔ فریڈمین ٹیسٹ نے حوصلہ افزائی کے طول و عرض ($p < .001$) کے درمیان اہم فرق کا انکشاف کیا۔ تدریسی قابلیت (۳٫۳۶ ± ۰٫۳۳)، انعام اور ترغیبی نظام (۳٫۳۵ ± ۰٫۵۹)، اور ذاتی دلچسپی اور ترغیب (۳٫۳۳ ± ۰٫۳۶) نے سب سے زیادہ اوسط اسکور حاصل کیے، جب کہ کام کا بوجھ اور ذمہ داریاں (۳٫۷۷ ± ۰٫۹۵) اور تعلیمی ڈھانچے اور پالیسیوں کو ۰٫۳ ± درجہ بندی کیا گیا۔ کم کوالیٹیو نتائج نے تدریسی قابلیت، منصفانہ انعامات، مثبت طلباء کے تعامل، معاون ماحول، اور تدریس میں سہولت کے لیے AI ٹولز کی سمجھی جانے والی صلاحیت کو اجاگر کیا۔
نتیجہ: تدریس کے حوالے سے فیکلٹی ممبران کی حوصلہ افزائی کثیر جہتی ہے اور انفرادی، تعلیمی، تنظیمی، اور تکنیکی عوامل سے متاثر ہوتی ہے۔ تدریس میں مستقل مشغولیت کے لیے قابلیت اور معاون ماحول کی تخلیق پر توجہ دینے کی ضرورت ہوتی ہے۔
کلیدی الفاظ: حوصلہ افزائی؛ مصنوعی ذہانت؛ طبی تعلیم؛ تدریسی قابلیت

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INTRODUCTION

Clinical education is a cornerstone of medical education, essential for developing competent physicians, professional skills, and high-quality healthcare delivery (1). It prepares students for complex clinical situations while fostering professional ethics and humanistic values (2). However, physicians' motivation to teach is shaped by individual, professional, and organizational factors, including workload, student interactions, educational culture, and institutional support (3, 4) .

The rapid advancement of artificial intelligence (AI) and digital technologies has transformed medical education and reshaped educators' professional identities and motivational experiences (5, 6). AI tools may enhance competence and autonomy through rapid feedback, personalized learning, and educational decision support (7, 8). Conversely, inadequate preparedness for AI use and concerns about the diminishing role of traditional teaching may create motivational challenges (9). These changes suggest that the integration of artificial intelligence may influence not only how clinical education is delivered but also how physicians perceive their competence and professional identity as educators. However, the direction and extent of this influence on physicians' motivation to teach remain insufficiently understood. Consequently, the AI era is redefining physicians' perceptions of teaching, professional roles, and learner interactions.

Teaching motivation is a multidimensional, context-dependent construct influenced by individual, social, and organizational factors. Self-determination Theory emphasizes competence, autonomy, and relatedness (10), Expectancy-value Theory highlights perceived ability and task value (11), and Achievement Goal Theory focuses on learning and performance goals (12). Together, these perspectives suggest that physicians' teaching motivation is shaped by professional value, feedback, organizational support, and educational environments undergoing technological changes.

Previous studies have examined specific aspects of physicians' teaching motivation, including organizational influences, intrinsic motivation, and personal values (2, 3, 12). Positive interactions with students and colleagues, particularly when accompanied by constructive feedback, strengthen teaching satisfaction and perceived value (13, 14), while supportive organizational cultures promote educational engagement (15) . Nevertheless, these studies have largely examined teaching motivation within conventional educational contexts, with relatively limited attention to how emerging technologies may reshape the motivational experiences of physicians engaged in teaching. This limitation is particularly important in the context of artificial intelligence, where changes in educational practices may simultaneously create new opportunities and raise concerns regarding evolving professional roles.

Although AI can enhance communication, real-time feedback, and adaptive learning (16), existing evidence has paid limited attention to how physicians experience AI-related changes in their roles as clinical educators and how these changes relate to their motivation to teach. Specifically, empirical evidence remains limited regarding the relative contribution of individual, educational, organizational, and technological factors to physicians' teaching motivation in AI-enhanced clinical education. Moreover, existing studies have not adequately integrated quantitative evidence on the relative importance of motivational dimensions with qualitative accounts of physicians' experiences and perceptions. Addressing this gap requires a mixed-methods approach capable of both identifying the factors associated with physicians' teaching motivation and explaining how physicians experience and interpret these factors within evolving educational environments. little is known about its influence on physicians' teaching motivation. Existing research has focused primarily on technical applications, with limited attention to physicians' motivational experiences in AI-enhanced environments. Moreover, no mixed-methods study has comprehensively explored the multidimensional factors influencing physicians' teaching motivation amid AI-driven changes. Such knowledge could inform faculty development, supportive policies, and motivating educational environments (17, 18), ultimately improving clinical education and educational outcomes(19–21). Therefore, this explanatory mixed-methods study aimed to identify and explain the factors influencing educators' teaching motivation in the era of AI by integrating quantitative findings with qualitative accounts of their experiences.

METHODS

Study design and setting

This study employed an explanatory concurrent mixed-methods design (22) and was conducted in 2025 at Imam Reza, Valiasr, and Razi teaching hospitals affiliated with Birjand University of Medical Sciences, Iran. Quantitative and qualitative data were collected and analyzed concurrently, with findings integrated during interpretation. This design was selected to provide a comprehensive understanding of educators' teaching motivation by combining the identification of influential factors with an exploration of participants' experiences and contextual influences.

Quantitative Phase

Participants and sampling

The quantitative phase used a descriptive cross-sectional survey of educators involved in clinical

teaching. The study population included university educators either faculty members (professors, associate professors, and assistant professors) or non-faculty instructors engaged in medical student education.

Stratified random sampling was performed based on hospital affiliation, with proportional allocation according to the number of educators in each hospital. Representation from different specialties was also considered. Eligible participants had at least six months of clinical experience and active involvement in teaching medical interns or clerkship students. educators on extended leave or not engaged in educational activities were excluded. A total of 72 educators completed the questionnaire, including 49 (68.1%) faculty members and 23 (31.9%) non-faculty instructors.

Instrument

Data were collected using a researcher-made questionnaire derived from a prior meta-synthesis study (23). The initial item pool consisted of 64 items addressing facilitators and barriers to teaching motivation. The initial 64-item pool was reviewed by experts for relevance, clarity, and conceptual overlap. Items identified as conceptually redundant were merged, while items considered unclear or insufficiently relevant were revised or removed. Following this iterative expert-review process, the item pool was reduced to 21 item. The final questionnaire items are provided in Appendix A. Content validity was assessed using the Content Validity Ratio (CVR = 0.96) and Content Validity Index (CVI = 0.82). The revised questionnaire was subsequently pilot-tested with 10 educators (clinical physicians) to assess the clarity and comprehensibility of the items, and minor wording revisions were made based on their feedback.

Bartlett's test of sphericity was significant (χ^2 = 581.12, df = 231, $p < 0.001$), whereas the Kaiser–Meyer–Olkin (KMO) measure was 0.554, indicating marginal rather than strong sampling adequacy. Although the significant Bartlett's test indicated that the correlation matrix was suitable for examining inter-item relationships, the KMO value was only marginal and the sample size was relatively small (n = 72) compared with the number of items (21), resulting in a limited participant-to-item ratio. Therefore, exploratory factor analysis was not performed, as the available sample was considered insufficient to yield a stable and reliable factor structure. Given that the primary purpose of the questionnaire was to assess theoretically derived motivational domains rather than to establish a new factorial structure, factor analysis was deferred to future studies with larger samples.

The questionnaire consisted of demographic items and 21 motivational items covering nine domains: teaching competence, personal interest and motivation, professional and social influences, educational structures and policies, workload, social interactions, reward and incentive systems, educational supervision, and educational facilities. Responses were rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Three open-ended questions were included to obtain additional qualitative insights.

Data Collection and Analysis

Data were collected through printed or QR code–based electronic questionnaires. Participants provided informed consent and were assured of anonymity and confidentiality. Data were analyzed using SPSS version 21. Descriptive statistics (means, standard deviations, and frequencies) were calculated, and the Friedman test was used to determine the relative importance of motivational factors.

Qualitative Phase

Participants and sampling

Twenty educators were purposively selected from the quantitative sample using nested purposive sampling. Participants were selected to ensure maximum variation in clinical specialty, professional experience, faculty status, and level of teaching motivation, thereby capturing diverse perspectives on educators' teaching motivation. Recruitment was guided by the emerging quantitative findings and continued iteratively to include participants with diverse characteristics and perspectives relevant to the study objectives. Data collection and analysis proceeded concurrently, with each interview informing subsequent sampling and exploration. Data saturation was considered to have been achieved after the 18th interview, when successive interviews yielded no substantially new codes, categories, or concepts relevant to the study objectives. Two additional interviews were conducted to confirm the stability and completeness of the emerging categories, resulting in a final qualitative sample of 20 educators.

Qualitative data collection and analysis

Qualitative data were obtained through semi-structured interviews and responses to open-ended questionnaire items. Data were analyzed using inductive content analysis following Elo and Kyngäs (2008) (24), involving data immersion, open coding, category development, and identification of themes and subthemes.

Trustworthiness was established using Lincoln and Guba's criteria (25). Credibility was enhanced through prolonged engagement and member checking with five educators. Transferability was supported by rich contextual descriptions and participant quotations. Dependability was ensured through detailed documentation and team review of findings, while confirmability was strengthened through external review of coding and interpretations by two independent researchers.

Integration of Quantitative and Qualitative

Quantitative and qualitative findings were

integrated during the interpretation phase using a convergent comparison approach. First, the quantitative findings were organized according to the nine motivational dimensions and their relative rankings. The qualitative findings were then mapped onto these dimensions based on the themes, categories, and concepts identified through inductive content analysis. Findings from the two phases were systematically compared to identify areas of convergence, complementarity, and divergence. Convergence was established when qualitative findings supported the relative importance identified quantitatively; complementarity was identified when qualitative data provided contextual explanations or mechanisms underlying quantitative patterns; and divergence was noted when qualitative accounts revealed perspectives that were not fully reflected in the quantitative results. The integrated interpretation was subsequently used to develop an overall understanding of the factors influencing educators' teaching motivation in the context of AI-enhanced clinical education.

Participant Characteristics

RESULTS

A total of 72 faculty members from diverse specialties and academic ranks participated in the study. Of them, 41 (56.9%) were female and 31 (43.1%) were male. Professional experience ranged from 1 to 35 years (Mean = 13.9, SD = 4.9). Assistant professors represented the largest academic group (n = 28, 38.9%). Participants came from various specialties, most commonly cardiology (n = 11), pediatrics (n = 10), and neurology (n = 10) (Table 1).

Table 1. Demographic characteristics of participants

Characteristic	Category	N (%)
Gender	Female	41 (56.9)
	Male	31 (43.1)
Academic rank	Professor	6 (8.3)
	Associate Professor	15 (20.8)
	Assistant Professor	28 (38.9)
	Non-faculty educator	23 (31.9)
Clinical specialty	Cardiology	13 (18.1)
	Neurology	10 (13.9)
	Pediatrics	9 (12.5)
	Internal Medicine	7 (9.7)
	Emergency Medicine	6 (8.3)
	Infectious Diseases	3 (4.2)
	Ophthalmology	3 (4.2)
	Obstetrics and Gynecology	3 (4.2)
	Radiology	2 (2.8)
	Otorhinolaryngology	2 (2.8)
	General Surgery	2 (2.8)
	Rheumatology	2 (2.8)
	Endocrinology	1 (1.4)
	Neonatology	1 (1.4)
	Pulmonology	1 (1.4)
	Radiation Oncology	1 (1.4)
	Medical Education	1 (1.4)
	Nephrology	1 (1.4)
	Anesthesiology	1 (1.4)
	Dentistry	1 (1.4)
	Urology	1 (1.4)
	Total	**72 (100)**

Quantitative Findings

Teaching competence (Mean = 4.46, SD = 0.44), reward and incentive systems (Mean = 4.45, SD = 0.59), personal interest and intrinsic motivation (Mean = 4.44, SD = 0.46), educational facilities (Mean = 4.41, SD = 0.59), and social interactions (Mean = 4.27, SD = 0.61) were rated as the most influential factors affecting teaching motivation. Lower ratings were observed for educational monitoring and evaluation (Mean = 4.22, SD = 0.84), educational policies and structures (Mean = 3.90, SD = 0.60), and workload and responsibilities (Mean = 3.77, SD = 0.95) (Figure 1).

The Friedman test revealed significant differences among the nine motivational dimensions (χ^2 = 212.373, df = 8, $p < .001$, Kendall's W = 0.369), indicating a moderate effect size. Teaching competence (mean rank = 6.71) and reward systems (mean rank = 6.09) received the highest rankings, whereas professional and social impacts received the lowest mean rank (1.85). Overall, competence, intrinsic interest, and recognition emerged as the strongest contributors to faculty members' teaching motivation.

Qualitative Findings

Teaching Competence

Qualitative findings provided further insight into the meaning of teaching competence and why it was highly valued by participants. Faculty members described teaching competence as encompassing both pedagogical skills and disciplinary expertise, emphasizing that effective teaching requires the ability to translate clinical knowledge into meaningful learning experiences. Several participants highlighted the importance of developing teaching skills early in professional training, particularly during residency:

"Teaching skills should be taught from residency because that is when responsibility for educating students and junior residents begins. If you do not learn these skills properly from the beginning, it becomes difficult to teach effectively later."

Participants also stressed the need for practical, clinically relevant faculty development:

"In workshops, we often receive theoretical content and think it sounds very good, but once we return to the classroom or bedside, we are unable to apply it in practice."

Clinical expertise and teaching ability were perceived as complementary:

"If you have strong academic knowledge but cannot transfer it to students, you feel ineffective. On the other hand, if you know how to teach but lack sufficient scientific knowledge, you feel you have little to offer learners."

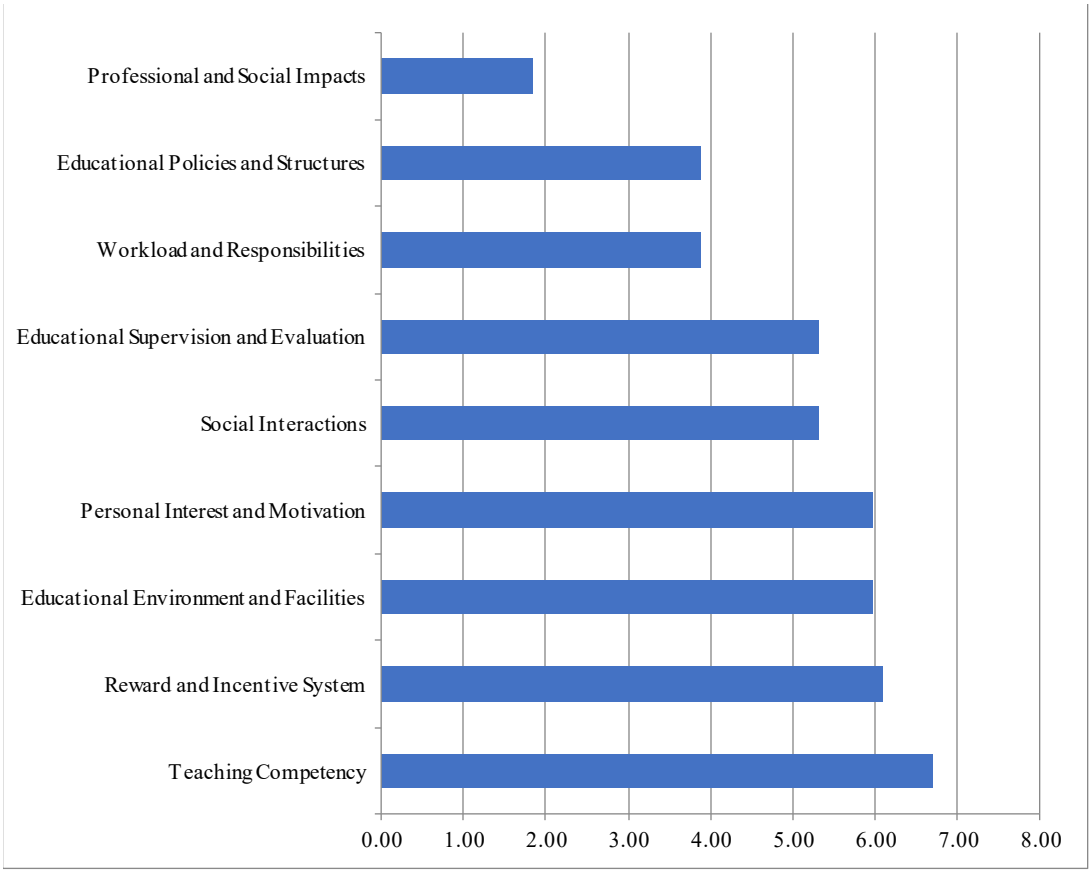

Figure 1. Key factors influencing educators' teaching motivation: descriptive analysis of motivational dimensions

Several participants highlighted the growing role of AI in strengthening teaching competence through instructional design support, generation of clinical examples, and facilitation of learning:

"When we attend workshops on curriculum planning and teaching methods, we should also learn how to use AI for better educational design and more practical examples because these technologies can make teaching easier and more engaging."

Reward and Incentive Systems

Qualitative findings indicated that educators perceived fair recognition and appropriate compensation as important signals of institutional appreciation for their educational contributions. Participants emphasized that rewards were most motivating when they were perceived as fair, transparent, and proportionate to the effort devoted to teaching. Delays in educational payments and perceived inequities in promotion and compensation were described as factors that could discourage continued engagement in teaching activities.

"Unfortunately, the payment for teaching is extremely low, and even that is often delayed for months. If the system truly rewarded those who invest effort in teaching, it would make a major difference."

These accounts help explain the quantitative finding that reward and incentive systems were among the more highly ranked motivational dimensions, suggesting that the motivational value of rewards may depend not only on their availability but also on educators' perceptions of fairness and institutional recognition.

Personal Interest and Motivation

Qualitative findings indicated that educators experienced teaching as personally meaningful and intrinsically rewarding. Participants described enthusiasm for teaching, opportunities to share clinical experiences, and continuous updating of their knowledge as important aspects of their educational engagement. Teaching was also perceived as a means of professional growth, lifelong learning, and personal satisfaction.

"For me, teaching is not just a job; it is a passion that keeps me updated and allows me to share my experiences with students and colleagues."

These accounts help contextualize the relatively high quantitative rating of personal interest and intrinsic motivation, suggesting that educators' engagement in teaching may be reinforced by the personal and professional satisfaction derived from the educational role.

Educational Space and Facilities

Qualitative findings indicated that the availability and adequacy of educational facilities were perceived as important contextual conditions for effective clinical teaching. Participants expressed concern that increasing student numbers without a corresponding expansion of educational infrastructure could compromise the quality of clinical training and make teaching more challenging.

"Every year, the number of students entering the university increases, but nobody considers where or how these students are actually supposed to be trained."

Some participants perceived AI-supported simulations, virtual clinical cases, and other digital learning tools as potential supplementary resources in settings where conventional educational facilities are limited. However, these accounts reflected participants' perceptions of the potential utility of such technologies rather than evidence of their actual effectiveness in addressing infrastructure constraints.

Social Interactions

Qualitative findings highlighted the importance of respectful and constructive relationships with students and colleagues in sustaining educators' engagement in teaching. Participants described positive feedback from students as a meaningful source of encouragement and emphasized that respectful interactions could strengthen their commitment to educational activities.

"Positive feedback from students can be more influential than many other factors and genuinely motivates me to teach better."

At the same time, some participants expressed concerns about perceived changes in students' levels of respect and engagement, which they viewed as potentially discouraging for their teaching involvement. These accounts provide contextual insight into the quantitative findings concerning the role of social interactions in educators' teaching motivation.

Monitoring and Evaluation

Qualitative findings indicated that educators perceived educational monitoring and evaluation as more motivating when they were developmental and feedback-oriented rather than primarily focused on control or punishment. Participants emphasized that evaluation should provide constructive guidance and support continuous improvement in teaching practice.

"Evaluation should help us understand how to improve, not simply focus on identifying mistakes."

These accounts help explain the quantitative findings by suggesting that the motivational value of evaluation may depend on how the evaluation process is implemented and perceived by educators.

Educational Policies and Structures

Qualitative findings indicated that faculty members valued educational programs that were flexible and responsive to learners' needs and the realities of clinical practice. Participants emphasized that alignment between curricula, educational objectives, and local healthcare needs could make teaching more meaningful and facilitate greater engagement in educational activities.

"When educational programs are flexible and aligned with students' real needs and the local context, teaching becomes more meaningful and engaging for me."

These findings provide contextual insight into the quantitative results, suggesting that the motivational influence of educational policies and structures may depend on their flexibility, relevance, and responsiveness to the clinical context.

Workload and Responsibilities

Qualitative findings indicated that clinical workload and administrative responsibilities were perceived as important constraints on educators engagement in teaching. Participants described competing clinical demands as limiting the time and energy available for educational activities.

"We are forced to devote most of our time to patient care, leaving very little time for teaching."

Some participants perceived AI-supported systems as potentially useful for reducing repetitive administrative tasks and creating additional time for teaching. However, these accounts reflected participants' expectations regarding the potential utility of AI rather than evidence of an actual reduction in workload or an increase in teaching motivation. Further empirical research is therefore needed to determine whether and to what extent AI-supported technologies can reduce educators' workload and facilitate their engagement in teaching.

Professional and Social Impacts

Qualitative findings indicated that faculty members did not consistently perceive teaching as a primary pathway to professional advancement or social recognition. Although some participants viewed teaching as contributing to their academic identity and professional development, others perceived limited opportunities for career advancement or social recognition through educational activities. As one participant explained:

"Teaching makes me feel that I am not only a physician, but also someone who contributes to the development of future physicians."

This perspective highlights the perceived contribution of teaching to professional identity and the sense of contributing to the development of future physicians. However, participants also noted that the professional value of teaching was not always reflected in career advancement or formal recognition. These accounts provide contextual insight into the relatively moderate quantitative rating of professional and social impacts,

suggesting that the perceived career value of teaching may vary among faculty members.

Other Factors

Additional influences included fairness in educational compensation, responsibility for training future educators, organizational respect for educators, educational planning, and student admission policies. Variability in students' preparedness and motivation was also perceived as a challenge:

"Because of differences in admission pathways, students vary greatly in both academic level and motivation, and this makes effective teaching much more challenging."

Integration of Findings

Integration of quantitative and qualitative findings showed that teaching motivation is shaped by interacting individual, organizational, and contextual factors. Quantitative results identified the relative importance of motivational dimensions, whereas qualitative findings explained the experiences and mechanisms underlying these influences. Across both phases, teaching competence, reward systems, intrinsic motivation, and educational resources emerged as central drivers of motivation. The findings further suggest that AI is increasingly redefining several motivational dimensions, particularly teaching competence, educational infrastructure, and workload management within clinical education.

DISCUSSION

The present study examined the factors influencing educators' teaching motivation in the context of AI-driven transformations in medical education. The findings indicate that teaching motivation is a multidimensional construct shaped by the interaction of teaching competence, intrinsic interest, social interactions, reward systems, workload, educational policies, infrastructure, and organizational support. It appears that these factors do not operate independently but rather interact across individual, interpersonal, and organizational levels, suggesting that educators' motivation to teach is more complex and embedded within a broader educational and organizational context.

Teaching competence emerged as one of the strongest motivational drivers. This finding is consistent with previous studies highlighting the importance of pedagogical skills and scientific confidence for effective educational engagement (26, 27). Similarly, mastery of clinical knowledge has been associated with greater willingness to participate in teaching activities (28).Qualitative findings further emphasized the value of practical faculty development experiences, supporting evidence that coaching and continuous feedback enhance teaching self-efficacy and instructional competence (29).

The findings suggest that teaching competence in the AI era extends beyond disciplinary expertise to include AI literacy and the effective use of intelligent educational tools. Unlike earlier studies emphasizing clinical competence (13), participants viewed AI-supported instructional design, clinical example generation, and learning facilitation as important contributors to teaching effectiveness and motivation. These results highlight the need to integrate AI-related competencies into faculty development programs, as AI-driven analytics and feedback may further enhance teaching and educators' self-efficacy.

Intrinsic motivation was another major contributor to educational engagement. Participants described teaching as a source of personal fulfillment, professional growth, and continuous learning, consistent with previous research identifying intrinsic motivation as a key determinant of teaching commitment (4). Similar findings have shown that enjoyment of teaching promotes lifelong learning and professional development (30). Participants also suggested that intelligent feedback systems may strengthen intrinsic motivation by making educational outcomes more visible and enhancing professional satisfaction.

Social interactions, student feedback, and professional respect were also important motivational influences. These findings align with studies emphasizing the role of interpersonal relationships and professional appreciation in educator well-being and job satisfaction (31, 32). This finding can be interpreted through Self-determination Theory (SDT), which posits that perceived competence is a fundamental psychological need. When educators perceive themselves as capable of teaching effectively and translating their clinical expertise into meaningful learning experiences, teaching may become more intrinsically rewarding and psychologically satisfying. Although some participants perceived generational shifts and declining respect toward educators as demotivating factors, many continued to regard teaching as a central component of their professional identity. In contrast to studies reporting negative effects of student involvement on clinical practice and patient satisfaction (33, 34), participants generally perceived positive recognition of their educational role. This difference may partly reflect contextual variation across clinical settings, institutional cultures, and the nature of physician–student interactions, rather than a contradiction between the studies.

Consistent with previous research (35, 36), workload and competing responsibilities were identified as significant barriers to teaching motivation. Clinical duties, administrative demands, and time constraints limited opportunities for educational engagement. However, participants viewed AI as a facilitator. Automated documentation, scheduling, and other

administrative processes may reduce workload and free time for teaching activities (37, 38).

Educational infrastructure also emerged as an important factor. Participants reported that increasing student enrollment without proportional expansion of facilities negatively affected teaching quality and motivation, supporting earlier findings regarding resource and space limitations in clinical education (39, 40). AI-supported simulations, virtual learning environments, and intelligent patient scenarios may partially address these constraints by providing alternative opportunities for clinical training (41, 42).

Finally, reward systems, transparent policies, and organizational support played a central role in shaping teaching motivation. These findings are consistent with the evidence highlighting the importance of organizational justice, recognition, and managerial support in promoting educational engagement (7, 26, 28, 43–45). Participants emphasized that rewards are motivating only when perceived as fair and proportional to educational effort, while supportive policies and supervision enhance educators' sense of value, security, and commitment to teaching. From an Expectancy–value Theory perspective, although educators may value teaching, high clinical and administrative demands may increase the perceived cost of teaching and limit their motivation to engage in educational activities.

CONCLUSION

The findings indicate that educators' teaching motivation is shaped by the interplay of individual, professional, interpersonal, and organizational factors. Teaching competence, intrinsic motivation, social interactions, workload, reward systems, organizational support, and educational infrastructure emerged as important dimensions of teaching motivation. Qualitative findings also indicated that AI-related considerations are beginning to appear within educators' accounts of teaching competence, educational resources, and workload. However, because AI was not examined as an independent quantitative determinant, these findings should be interpreted as participants' perceptions rather than evidence of a direct effect of AI on teaching motivation. Accordingly, faculty development programs may consider strengthening educators' pedagogical competence and AI literacy, while organizational policies should address workload, educational resources, recognition, and equitable reward systems. This study was limited by its single-university setting, the use of open-ended questionnaire responses that may have restricted the depth of qualitative data, and its cross-sectional design, which precluded examination of changes in teaching motivation over time. Future studies should directly examine AI literacy and AI use as measurable variables and investigate their potential relationships with educators' teaching motivation and professional identity using longitudinal and multicenter designs.

Ethical Considerations:

This study was approved by the Ethics Committee of Birjand University of Medical Sciences with the ethics approval code: IR.BUMS.REC.1403.322. All participants were informed about the study objectives, and voluntary participation and the right to withdraw at any time were ensured. Verbal informed consent was obtained due to the study's low-risk nature and to maintain confidentiality in clinical settings. Permission was also obtained for audio-recording interviews, and all personal information was kept confidential.

Use of Artificial Intelligence in Manuscript Preparation

Artificial intelligence tools were used for summarizing, paraphrasing selected contents, and translating parts of the manuscript into English.

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Appendix

Appendix A. Final questionnaire items on factors influencing faculty members' teaching motivation

	Item	Dimension
1	Having teaching skills (e.g., instructional methods, assessment, student communication, and lesson planning) increases my motivation to teach.	Teaching Competence
2	Having strong academic competence in my area of specialty increases my motivation to teach.	
3	My passion for teaching increases my motivation to teach.	Personal Interest, Motivation, and Experiences
4	Positive experiences during my own education, including exposure to a good educational system and opportunities to teach others, increase my motivation to teach.	
5	Teaching provides me with an opportunity to share my clinical experiences.	
6	Keeping my knowledge up to date for teaching and fulfilling my educational role increases my motivation to teach.	
7	Teaching provides an opportunity for my academic and professional advancement.	
8	My role as a faculty member enhances the visibility and recognition of my professional work.	Professional and Social Influences
9	My educational responsibilities reduce the time available for patient care.	
10	Being a faculty member increases the respect I receive from patients.	
11	Patients' dissatisfaction with repeated encounters with students reduces my motivation to teach.	
12	Flexible educational programs and clear educational planning increase my motivation to engage in teaching activities.	Educational Policies and Structures
13	Alignment between the educational curriculum and educational needs increases my motivation to teach.	
14	Administrative and managerial responsibilities reduce my involvement in teaching activities.	Workload and Responsibilities
15	A heavy clinical workload limits my ability to fulfill my teaching role.	
16	Respectful behavior toward me as a faculty member by students and colleagues increases my motivation to teach.	Social Interactions
17	Positive interactions with students and favorable feedback from them increase my motivation to teach.	
18	A fair, impartial, and appreciative reward system increases my motivation to teach.	Reward and Incentive Systems
19	Appropriate compensation for teaching activities increases my motivation to teach.	
20	An appropriate system of educational monitoring and evaluation increases my motivation to teach.	Educational Monitoring and Evaluation
21	Adequate educational facilities and resources increase my motivation to teach.	Educational Facilities and Resources