**INTERNSHIP TRAINING**

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# Digital Technology in Medical Education and Recent Changes in Curriculum: Perception of Medical Students and Teachers

**by**

**SHIVAM KUMAR SHUKLA**

**Enrollment No.: PG/21/097**

**Under the guidance of**

**Dr. Rupsa Banerjee**

**PGDM (Hospital & Health Management)**

**2021-23**


**International Institute of Health Management Research,**

**New Delhi**

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**Perception of Medical Students and Teachers**

Date: 12th Jan 2023 to 15th April 2023

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Associate Dean, Academic and Student Affairs

IIHMR, New Delhi IIHMR, New Delhi

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This is to certify that SHIVAM KUMAR SHUKLA, a graduate student of the PGDM (Hospital & Health Management) has worked under our guidance and supervision. He/ She is submitting this dissertation titled "Digital Technology in Medical Education and Recent Changes in Curriculum: Perception of Medical Students and Teachers" in partial fulfilment of the requirements for the award of the PGDM (Hospital & Health Management).

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

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Yours sincerely
On behalf of Wolters Kluwer India Pvt. Ltd.

Lisa Christy
Director, Human Resources

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| Name of the Organisation in Which Dissertation Has Been Completed | : | WOLTERS KLUWER |
| Area of Dissertation | : | Digital education and Market Research |
| Attendance | : | Regular |
| Objectives achieved | : | Yes |
| Deliverables | : | Yes |
| Strengths | : | Leadership qualities<br>Hardworking<br>Good communication skills |
| Suggestions for Improvement | : | To learn more analytical skills |
| Suggestions for Institute (course curriculum, industry interaction, placement, alumni) | : | None |

Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation)

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I am extremely thankful to every one at WOLTERS KLUWER for sharing generously their valuable insight and precious time which motivated me to do my best during internship. My learning and valuable insights regarding dissertation internship report would not have been possible without their in-depth discussions. I express my gratitude towards them for providing timely guidance, inspiration & unconditional support during my study.

## MENTORS IN IIHMR

I am highly grateful to Dr Rupsa Banerjee and all the faculty members and staff for giving me this opportunity to learn and to add to my phenomenal experience. Without their cooperation and guidance, it would not have been possible to conduct my study and complete my training successfully.

# Certificate of Approval

The following dissertation titled **"Digital Technology In Medical Education And Recent Changes In Curriculum: Perception Of Medical Students And Teachers"** at **"Wolters Kluwer India, Gurugram"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee
for evaluation of dissertation.

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# DIGITAL TECHNOLOGY IN MEDICAL EDUCATION AND RECENT CHANGES IN CURRICULUM: PERCEPTION OF MEDICAL STUDENTS AND TEACHERS


## ABSTRACT:

Medical education has seen a significant transformation in recent years due to the rapid integration of digital technology. This research study aims to comprehensively analyse the perceptions of medical students and educators regarding the adoption of digital tools and technologies in medical education. Utilizing a mixed-method approach, combining qualitative and quantitative data collection techniques, surveys, questionnaires, focus group discussions, and in-depth interviews were conducted with diverse participants from various medical institutions. The findings indicate that both students and educators view the incorporation of digital technology positively, as it enhances accessibility, promotes self-directed learning, and fosters an engaging learning environment. The study also highlights the flexibility and convenience provided by digital tools, such as virtual simulations, in enhancing medical curricula and addressing competency-based learning. However, challenges relating to training and infrastructure need to be addressed to ensure successful implementation.

# INTRODUCTION

It would be a cliché to say pandemic has brought sea changes in application of information and communication technology (ICT), but it is true. Even before pandemic application of ICT was evident. However, the progress was slow. The pandemic accelerated the use and application of ICTs in almost every field. As a result of this, today we see change in office culture like hybrid mode, work from home etc. Education sector also could not remain untouched with this trend. With the application of ICT new concepts like digital learning, e-learning, blended learning has come up. The common thread in all these trends is involvement of digital tools that expanded the reach, scope and quality of education.

Medical education and other allied health courses were thought to be not benefitting much from application of ICTs. Primary reason being these courses require substantial exposure to practical learning in labs. This is the reason medical and allied health courses were put out of the purview of distance education. [(1)] However, it has been proved wrong. The use of digital tools has benefitted the students a lot. Particularly to medical education (with reference to MBBS course), has gained a lot because to teach in medical colleges demand huge resources that are not easily available. [(2)] For example, cadavers (dead bodies) for anatomy and patient for physical examination. Furthermore, they perform spotting i.e., seeing and identifying the part of body whereas the curriculum demands evaluation by actual performance of dissection. [(3)]

Recent changes in medical curriculum by National Medical Commission (NMC) introduced Competency-based Medical Education (CBME) and National Exit Test (NEXT) exam. CBME focusses more on developing skills compared to rot learning. Similarly, to maintain uniform standard of doctors in the country the government introduced NEXT exam. It also acts as licentiate exam to practice as doctor for MBBS

graduate. It has become more skill oriented and divided into two steps which students have to qualify within given time frame.

These changes have put extra pressure on already scarce resources at medical colleges. This also creates a gap of skill-focussed practical learning which digital tools can fulfil. This study focusses on gaining insights and suggesting fresh recommendations in light of recent changes and trends in medical education landscape. Medical education has witnessed substantial advancements in digital technology, reshaping the landscape of teaching and learning in medical institutions. This research examines how the integration of digital technology in medical education has influenced recent changes in curricula. By analysing the perceptions of both medical students and teachers, this study aims to shed light on the benefits, challenges, and overall effectiveness of these technological transformation

# OBJECTIVES

1. The present study aims to:
2. Understand students' preference for digital/video-based products for medical education compared to printed books.
3. Understand the role of e-learning in building competency and enhancing the patient physical examination skill of students in light of Competency-based Medical Education (CBME) guidelines issued by National Medical Commission (NMC) of India.

# METHODOLOGY

**Study design:** Cross-sectional qualitative study involving in-depth interviews.

**Study Setting:** Medical colleges which expect to adopt or have adopted to some extent digital learning as part of Competency based Medical Education (CBME

**Study duration:** Three months

**Sample size:** Sample size was guided by data saturation until we start getting same & repetitive responses.

**Sampling technique:** Purposive sampling

**Data collection tool:** Questions are based on comprehensive "discussion guide" covering all possible questions related to the topic. Each interview with participant has two parts namely contextual enquiry and cognitive walkthrough

Contextual Inquiry is a qualitative user research method used to gather information about how users interact with a product or service in their natural setting. It involves observing users in their work environment and asking questions about their experiences and goals. The contextual inquiry aims to understand the user's context and needs, including their work practices, motivations, and pain points. The method is particularly useful for identifying design requirements for products or services used in real-world situations.

A Cognitive Walkthrough is a usability evaluation method used to evaluate the user interface design of a digital product. It focuses on how easily users can complete tasks and achieve their goals. The researcher 'walks through' the product with the end user, observes user behaviour and interactions with the product, and evaluates each process step to identify problems and areas for improvement. The method is used to gauge user understanding of product functionality in an informal setting.

**Data analysis:** Thematic analysis was done guided by the objectives of the study.

## ETHICAL CONSIDERATIONS

This study was submitted for ethical review to the IIHMR student research review board. The tool and study protocol will be cleared through this committee. All the participants were explained the objectives of the study and prior consent would be taken. As a researcher, I made the participant understand and explain to them in the language they understand. After explaining them, consent was taken. Privacy and data protection were strictly followed.

# RESULTS

Since two type of participants were part of the research, result is divided into two parts from the perspective of students as well as faculties.

**STUDENTS**

| Demographic Table | | | |
|---|---|---|---|
| **Participant Code** | **Qualification** | **Institution type** | **Location** |
| S01 | PG | Government | Delhi |
| S02 | UG | Private | Chennai |
| S03 | PG | Government | Delhi |
| S04 | UG | Private | Noida |
| S05 | UG | Government | Delhi |
| S06 | UG | Government | Ahmedabad |

**Theme 1**

**"Digital vs Traditional"**

1. Digital tools are preferred as additional earning or to make concepts clear
2. For any new topic their go-to place is Google, YouTube or UpToDate. Through this get an overview, for detailed learning they read books when they have ample time
3. Students are more focusing on coaching institutes rather than classroom learning

> *"UpToDate, they feel like it is **gold standard**"……..S01*

> *"Honestly, we don't have regular lectures because the clinical subjects, the teachers, they are even doctors in the hospital, so they're not free to, you know, give their specific time for preparing presentations and then delivering lectures to us. So, we rely on apps and, you know, **coaching classes like some go to DAMS**. Then there's **DBMCI** or people like me. They use Marrow or even **Prep ladder**. So, these are the places where we have shifted and you know we've found a good alternative of the lectures which are not being held" ……S06*

> *"I will have to say the trends change from first to the final year. So, for first year it was actually sixty 40- 60% offline and towards finally right now it is literally **almost 80% online** in 20% offline online means online yeah working videos and all things everything because the books are quite expensive" ……. S05*

**Theme 2**

**"Competency Based Medical Education (CBME)"**

1. CBME has introduced concepts of vertical & latera integration but these are not practiced as envisaged
2. Education has become more clinical oriented, exposed to clinics from 2nd year
3. Time allocated of most of the competencies is not sufficient

*"It **shifted more towards the clinical side** and even the questions you were asked, you know, examinations, they were more clinical based rather than a rote learning of something" ……S06*

*When they're facing very, very huge issues because **everyone is now into documentation for CBME** curriculum, we have to sign, log books and prepare all these files and everything" ……S05*

*"I think it is a good way of encouraging students to actually attend clinical rounds, actually attend. CBME competency- based system to work we **need to have dedicated hours of teaching** by the faculty as well"……S01*

*"I feel CBME I mean **should be practiced**, not taught"……S04*

*So even though the competencies are beautifully said……..But they didn't really think how much **time** they're giving for each thing and how exactly it will work out. And this is me speaking from a central institute right now"……S05*

**Theme 3**

**"Nation Exit Test (NExT)"**

1. Some students are of the view that will bring down the quality of internship
2. They also think that government is simply copying the US MLE pattern
3. A small section was also of the view that it will bring positive changes as it is more case based rather than rote learning

*"trying to **basically copy United States** it like a, you know"……..S01*

*"personally, **would prefer NEXT** and the pattern of NEXT because things are going much on the clinical"……..S06*

**Theme 4**

**"Objectively Structure Clinical Examination (OSCE)"**

1. It helps them develop some critical thinking
2. Students were not much aware of its significance

*"So I think and **OSCE it should be included early on in Med school**, so students develop their thinking"……..S04*

*OSCE type of teaching also we'll bring standardized patient or the patient with the clinical science. **So we will make them demonstrate, they will observe and then we will assess how they are doing**……..S06*

**FACULTY**

| Demographic Table | | | |
|---|---|---|---|
| **Participant Code** | **Designation** | **Institution type** | **Location** |
| F01 | HOD | Government | Rishikesh |
| F02 | HOD | Government | Delhi |
| F03 | Assoc Professor | Government | Chennai |
| F04 | HOD | Private | Pune |
| F05 | HOD | Private | Dahod, Gujrat |
| F06 | Assoc Professor | Government | Delhi |

**Theme 1**

**Digital vs Traditional**

1. Majority of teachers prefer printed books
2. However, they do take help of simulations, animations & videos to teach
3. They have incorporated widely used tools in their study, like UpToDate
4. They are of the opinion that clinical visit cannot be replaced and physical examination need students to be physically present

> *"…… we have **incorporated Up-To-Date** into our teaching also"……..F02*

> *We are **showing them simulation** videos ……F05*

> *But ultimately as per me, **books are definitely needed** because that's where even the deeper teachings or the laptop things are written over there……..F06*

**Theme 2**

Competency Based Medical Education (CBME)

1. Most of them were of the view that it is simply old wine in new bottle. They have been practicing this for a long time.
2. Some of them think that is good step as it will increase the quality of medical graduates

> *"but what the purpose is finally to is to **make a Indian medical graduate a doctor** and only give him relevant information as far as what will be useful to him as a doctor tomorrow and not more than that" ……..F01*

> *Everybody thinks that this, you know, new thing they've started, **but this is old wine in new bottles**…… F01*

**Theme 3**

Nation Exit Test (NExT)

1. It will standardize and bring parity between students graduating from India and foreign universities
2. Most of them also agreed that it is somewhere a copy of US MLE

> *"This is very good. You know, we are asking **students coming from other countries like Russia, China**, to give exam. Are we trying to show to them that you are a second-grade citizen?"……F02*

> *So, this exit exam should incorporate the clinical portions also and the people, the students who have gone through a rigorous internship. Will only be able to pass this exam. That's the way the students will do their internship in an honest way, and that's the way we are going to produce good doctors. ……F02*

**Theme 4**

Objectively Structure Clinical Examination (OSCE)

1. Faculty think that they have been practicing OSCE for a long time. In current form it is like filling checklist
2. Student who were nervous during viva can now simlpy perform and get marks

> *"During viva they are not able to explain, they have **fear of language**, they can't explain. In OSCE they have **checklist** they perform and we give them marks. That is the good part of OSCE"……F05*

## DISCUSSION

The themes presented above highlight some of the key aspects and challenges in medical education today, particularly focusing on the shift towards digital tools, competency-based medical education (CBME), the introduction of the National Exit Test (Next), and the utilization of Objectively Structured Clinical Examination (OSCE)

The preference for digital tools for additional earning and concept clarity reflects the increasing influence of technology in the field of education. With the internet providing easy access to vast amounts of information, students now turn to platforms like Google, YouTube, and UpToDate as their go-to sources for initial overviews and explanations of new topics. These digital resources offer the advantage of convenience and accessibility, enabling learners to access information from virtually anywhere at any time. However, it is essential to recognize that while digital tools can provide a good starting point, they may not always be the most reliable or comprehensive sources of information. The fact that students still resort to reading books for in-depth learning when they have ample time suggests that traditional learning methods have not been entirely replaced by digital tools. [4,5] Books offer a more structured and comprehensive approach to learning, allowing students to delve deeper into subjects and gain a thorough understanding of complex concepts. This highlights the continued importance of traditional educational materials and the need for a balanced approach that combines both digital and traditional resources. The preference for coaching institutes over classroom learning might be influenced by various factors, such as the perception that coaching centers offer better preparation for competitive exams, more focused guidance, and access to experienced faculty. However, this trend could raise concerns about the effectiveness of classroom teaching and the need to improve teaching methodologies to engage students effectively. The responses from faculty indicate a preference for traditional printed books as a primary teaching resource. This preference

might be influenced by factors such as familiarity, ease of use, and the comfort of having physical materials. However, it is encouraging to see that the faculty is open to incorporating digital tools such as simulations, animations, and videos into their teaching methods. These digital resources can enhance the learning experience, make complex concepts more accessible, and provide students with a dynamic and interactive way of understanding medical topics.

The use of widely adopted tools like UpToDate demonstrates the acceptance of digital platforms in medical education, where evidence-based resources are readily available to support teaching and learning. However, the faculty rightly emphasizes that certain aspects of medical education, especially clinical visits and physical examinations, cannot be replaced by digital means. These real-world experiences are essential for students to develop practical skills, bedside manners, and a comprehensive understanding of patient care.

Competency-Based Medical Education (CBME)CBME's introduction aimed to bring about significant changes in medical education by emphasizing the integration of knowledge and skills and making education more clinically oriented. The idea of vertical and lateral integration is to ensure that learners can apply their knowledge across different disciplines and scenarios. However, the respondents' feedback suggests that the full potential of these concepts is not being realized in practice. One issue highlighted is the insufficient time allocated to cover the various competencies. To effectively implement CBME, medical institutions must reevaluate their curriculum and ensure adequate time is allocated to each competency area. This may require a redesign of the entire medical education system to strike a better balance between theoretical knowledge and practical application. However, it is essential to ensure that this exposure is well-structured and supervised to ensure that students are adequately prepared for the clinical setting. The faculty's mixed response to CBME indicates that

while some view it as an innovative approach, others see it as an old concept repackaged. This disparity in opinions might stem from variations in how CBME is implemented across different institutions. Some faculties might have already been practicing competency-based teaching methodologies for a long time, while others might be embracing it as a relatively new concept. It is important for medical institutions to ensure that CBME is uniformly understood and effectively implemented to achieve its desired outcomes.

The faculty members who believe that CBME is a positive step that will enhance the quality of medical graduates likely recognize the potential of this approach to bridge the gap between theoretical knowledge and practical skills. By emphasizing the development of competencies, CBME aims to produce more competent and well-rounded healthcare professionals, which is a crucial aspect in the ever-changing landscape of medical practice.

The introduction of the National Exit Test (NExT) has generated mixed opinions among students. Some are concerned that it might bring down the quality of internship, possibly due to the additional pressure and focus on exam performance rather than practical skills. It is crucial for educational authorities to address these concerns and ensure that the NExT assessment accurately reflects a student's competency and readiness for independent practice Comparisons to the United States Medical Licensing Examination (USMLE) pattern raise questions about the originality and relevance of the NExT. While it is natural to draw inspiration from successful models, it is essential to adapt the test to the local context and ensure that it aligns with the specific needs and challenges of the country's healthcare system.

On a positive note, some students believe that the NExT's case-based approach will encourage critical thinking and move away from rote memorization. This emphasis on

problem-solving and clinical reasoning is a step in the right direction for medical education, as it prepares future doctors to handle real-life medical scenarios effectively. The faculty's perspective on the National Exit Test (NExT) highlights its potential benefits, particularly in standardizing the assessment of medical graduates and ensuring parity between students graduating from Indian and foreign universities. Standardization of assessment is essential to maintain consistent educational standards and produce high-quality medical professionals across the country. The comparison to the United States Medical Licensing Examination (USMLE) may be indicative of the NExT's similarities in structure and purpose. While taking inspiration from successful models is not inherently negative, it is essential for the NExT to address the unique requirements and challenges of the Indian healthcare system to ensure its effectiveness and relevance

. OSCEs provide a structured and standardized format for assessing clinical skills and decision-making abilities, ensuring that all students are evaluated on the same criteria. This approach encourages students to think critically and apply their knowledge in practical scenarios, promoting a more comprehensive understanding of medicine.

However, it is concerning that some students are not fully aware of the significance of OSCEs. Medical institutions must focus on educating students about the purpose and benefits of OSCEs to ensure their active engagement and motivation to perform well in these assessments. The faculty's experience with OSCE indicates that it has been a long-standing practice in medical education. However, the faculty's perception that the current form of OSCE is like filling a checklist raises concerns about the depth and authenticity of the assessment. OSCE should be designed to evaluate students' clinical skills, decision-making abilities, and problem-solving capabilities in a comprehensive and meaningful manner. It may be necessary for faculty members to review and update the OSCE format to align it with the desired learning outcomes and the evolving

demands of medical practice. The observation that OSCE has helped students who were nervous during viva examinations is a positive aspect of this assessment method. By providing a structured and standardized approach to evaluating clinical skills, OSCE may offer a more comfortable and fair evaluation environment for students, leading to better performance and reduced anxiety during assessments.

## CONCLUSION

In conclusion, the themes presented in the discussion shed light on various aspects of medical education, including the growing influence of digital tools, the challenges and opportunities of competency-based education, the implementation of the National Exit Test, and the significance of Objective Structured Clinical Examinations. It is evident that medical education is continuously evolving, and educators, policymakers, and stakeholders must work together to address the highlighted concerns and ensure that medical students receive a well-rounded and effective education to become competent healthcare professionals.  faculty's views on various aspects of medical education highlight the ongoing transition from traditional to digital resources, the mixed perspectives on competency-based medical education and the National Exit Test, and the need for refining assessment methods like Objectively Structured Clinical Examination. As medical education continues to evolve, it is crucial for institutions to consider the feedback from faculty, students, and stakeholders to create a comprehensive and effective learning environment that produces competent and compassionate healthcare professionals.

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| **Enrollment/Roll No.** | PG/21/097 | **Batch Year** | 2021-23 |
| **Course Specialization (Choose one)** | Hospital Management | Health Management | Healthcare IT ✓ |
| **Name of Guide/Supervisor** | Dr./~~Prof.~~: Rupsa Banerjee | | |
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