

## ORIGINAL ARTICLE

# Anatomy Beyond the Classroom: Student Reflections on WhatsApp-Based Learning

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**ABSTRACT**

WhatsApp is a free, cross-platform messaging application widely used by undergraduate students to share multimedia content such as photos, videos, audio clips, and text messages. The present study aimed to assess the perception, attitude, and perceived usefulness of WhatsApp group discussions as a teaching-learning tool in anatomy for first-year medical students. A significant majority (87%) of students found WhatsApp group discussions useful, while 8.7% did not find it beneficial, and 4.3% were uncertain. Students appreciated the ease of access to learning materials, discussion threads, and the continuous availability of peer and faculty support. This flexibility enabled them to revisit and reinforce complex topics such as neuroanatomy and histology at their own pace. Overall, most students considered WhatsApp group discussions to be a valuable supplementary tool that enhanced their anatomy learning outside the classroom. When effectively moderated, it served as an informal yet impactful extension of academic discourse.

**KEYWORDS**

• Whatsapp • Effective learning tool • e-learning • Collaborative learning

**INTRODUCTION**

**Background:** In recent years, numerous computer-based teaching resources have been

developed, and electronic learning (e-learning) has gained significant traction in medical education, supported by the emergence of

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guidelines for its effective implementation. Concurrently, the advent of next-generation smartphones has led to a marked increase in daily screen time, particularly among young individuals, thereby fueling a growing interest in mobile learning (m-learning) among educators.<sup>1</sup> Advancements in smartphone technology and enhanced internet accessibility have profoundly influenced modern life, notably reshaping the landscape of medical education.<sup>2</sup>

Effective communication in online learning whether between students or between students and lecturers can be challenging. To enhance interaction within, lecturers have incorporated various technological tools. Among these, WhatsApp (WA) has emerged as a widely used and effective social media platform for facilitating group discussion.<sup>3</sup> Furthermore, due to the time constraints of synchronous platforms like Zoom Cloud Meetings, learning discussions are often continued through WhatsApp class groups. However, perceptions of written communication on WhatsApp vary among individuals, highlighting both its value and its limitations as a modern educational communication tool.<sup>4</sup>

Numerous studies have demonstrated the effectiveness of using WhatsApp (WA) to support the online learning process. This platform enables students and lecturers to maintain communication and engage in meaningful learning interactions through instant messaging technologies. The use of such applications allows for the extension of learning beyond the boundaries of formal classroom settings, offering the advantage of flexible, real-time communication with minimal time constraints.<sup>5</sup>

The integration of WhatsApp into anatomy education offers a flexible, accessible, and interactive platform that complements traditional teaching methods. It enables real-time communication between students and faculty, facilitating the quick resolution of doubts and promoting continuous engagement outside the classroom. WhatsApp supports the sharing of multimedia resources such as labeled anatomical diagrams, videos, mnemonics, and clinical images, which are essential for visual learning in anatomy. Additionally, group discussions encourage peer-to-peer learning and active participation, fostering a collaborative learning environment.

The platform's ease of use, low cost, and widespread accessibility make it a practical tool for enhancing student understanding and retention of anatomical concepts, especially in resource-limited or remote learning contexts. Therefore, the present study was undertaken to facilitate deep learning of anatomy through case-based discussions conducted via WhatsApp, and to assess students' perceptions regarding the effectiveness of WhatsApp group discussions as a learning tool.

## METHODOLOGY

The participants of this study were first-year undergraduate MBBS students from the 2018–2019 batch at JSS Medical College. A descriptive qualitative case study design was employed. In the dissection hall, students were organized into tables based on their roll numbers, with approximately 25 students per table. Each table was assigned a dedicated faculty member as the table teacher. For the purpose of this study, one table group was selected, allowing focused observation and interaction under the guidance of a single faculty member responsible for that group.

Once the table groups were allotted, students were instructed to create a dedicated WhatsApp group for their table, to which the faculty in charge was also added. The relevant dissection, theory, and histology topics were communicated in advance. Each morning, the faculty would post a case scenario related to the previous week's topic, encouraging students to analyze and discuss it within the group. Faculty intervention occurred after approximately 50% of the students had responded, ensuring active student participation. Students were encouraged to ask questions and clarify doubts within the group, with both the faculty and peers contributing to responses, thereby fostering meaningful and collaborative discussions.

A structured questionnaire was developed to assess students' perceptions of the WhatsApp-based anatomy learning tool. The questionnaire included both Likert scale items to measure the perceived usefulness and effectiveness, as well as open-ended questions to capture detailed reflections. To ensure content validity and relevance, the questionnaire was reviewed by subject experts. It was then administered to participants via Google Forms.

The qualitative data obtained from the open-ended responses were analyzed using thematic analysis, allowing for the identification of key themes and insights related to students' experiences and the perceived usefulness of WhatsApp as a learning tool. This approach enabled a deeper understanding of student engagement, interaction, and satisfaction with the mobile-based discussion platform.

## RESULTS

Out of the 25 students in the selected group, 24 responded to the questionnaire, yielding a response rate of 96%. This high response rate indicates active participation and provides a reliable basis for analyzing students' perceptions of WhatsApp-based anatomy learning.

Question	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
WhatsApp discussions helped me understand difficult anatomy concepts better	4.2%	4.2%	8.3%	62.5%	20.8%
Case-based discussions in the WhatsApp group were engaging and informative	8.3%	—	—	16.7%	75
The discussions encouraged me to read and prepare anatomy topics in advance	20.8%	—	8.3%	25%	45.9%
I would recommend using WhatsApp for learning other batches/ subjects as well	—	4.2%	4.2%	16.6%	75%

87% of students opined that what's app group discussion was useful and 8.7% felt that it was not useful and 4.3% students were not sure of it.

### Benefits

- Shared content related to lectures proved to be useful.
- Communications between students and teachers was made easier.
- Easy platform for sharing problems, questions, both academic and extra and co curricular.
- Important study related videos were also shared, which also helped us a lot.
- Sharing of videos and other charts has been very helpful.
- All the information regarding any subject was available easily Even we were able to clear our doubts at any time.
- Sharing of information and good platform to share academia.
- Study materials and important notifications could be easily available.
- All doubts were cleared on spot.
- Good way of keeping updated.

### Demerits

- Sometimes, a bit of a waste of time on some useless topics due to spam messages.
- Some topics that could have been told on the group were not told.
- Kind of a distraction...post unnecessary messages.
- The dissection modules could also have been shared.
- Many notices were only posted in this group and failed to be put up elsewhere.
- Off-topic conversations occasionally disrupting academic focus.
- Difficulty in tracing back older messages or discussions.

### Suggestions made

- Use it as a forum for discussing exclusive academic matters.
- More teacher interaction.
- Should be continued for upcoming batches.
- Send more study material to the group.
- Post more related videos, question papers, clear doubts, give exam tips... and so on.
- Please send all the dissection modules on WhatsApp the day before it is scheduled, it will enhance the learning.
- It should be continued.

## DISCUSSION

What's up based discussion to learn anatomy improved conceptual understanding as students reported better understanding of complex anatomical topics, especially through case-based discussions. It also reinforced concepts discussed in class, enabling deeper learning and retention. It increased student engagement and students felt more comfortable asking doubts. Allowed asynchronous learning, accommodating different learning paces and schedules. Discussions promoted collaborative learning, where students helped each other clarify concepts. Sharing of images, labeled diagrams, and links to videos enriched the learning experience. Notably, 87% of students agreed that WhatsApp was a useful learning tool and recommended its extension to other subjects in the curriculum.

In a study conducted among dermatology residents, 69.2% of respondents found the WhatsApp-based educational initiative effective, while 23.1% rated it as very effective. When compared to traditional in-person discussions, 61.5% of participants considered WhatsApp or text-based communication to be equally effective, whereas 30.8% perceived it as less effective. The noted strengths of the initiative included ease of access to review materials, enhanced sense of connection with faculty and peers, and the overall enjoyment it added to their daily routine.<sup>6</sup>

In a study conducted by Swathi among final-year MBBS students, 94.6% of participants reported reading the entire WhatsApp-based clinical discussion. A majority (89.2%) felt that the discussions increased their awareness of errors in interpreting clinical findings. Furthermore, 81.1% indicated that the activity improved their ability to analyze clinical cases and develop differential diagnoses with appropriate reasoning. Most students (86.5%) described the learning experience as enjoyable through this innovative method. However, 18.7% reported difficulty in finding sufficient time to engage in the discussions. Additional challenges cited included time constraints, the fast-paced nature of interactions particularly during night hours and a perceived pressure to continuously check messages until their queries were resolved.<sup>7</sup>

A study conducted by Sonia *et al.* revealed that 70% agreed that it fostered both a professional and comfortable learning environment.

More than 70% of participants reported that the facilitator effectively promoted critical thinking and self-directed learning, while also managing distractions appropriately during the sessions. Although the pre-intervention mean scores between the WhatsApp and didactic teaching groups did not show a statistically significant difference, both groups demonstrated significant improvement in post-intervention scores compared to their respective baselines.<sup>8</sup>

Learners also reported several challenges associated with using WhatsApp as a teaching-learning tool. Over 60% cited technical issues such as limited smartphone availability, message flooding, and the time-consuming nature of reviewing extensive discussions. Additionally, prolonged screen time was linked to ocular muscle fatigue. Furthermore, 74.97% of learners noted a lack of active contribution by some participants, and 79.62% expressed concern that certain learners shared materials merely to impress the facilitator, rather than to enhance group learning.<sup>8</sup>

WhatsApp-based discussions were found to significantly enhance students' interest and engagement in subjects. Researchers observed that the platform not only piqued students' curiosity but also contributed to better retention of knowledge, as evidenced by higher post-test MCQ scores compared to pre-test scores.<sup>2</sup>

Students reported that the case-based format in what's app encouraged critical thinking and analytical skills, making the learning process both interactive and enjoyable. Most participants described WhatsApp-based learning as "fun and effective," emphasizing its informal yet structured environment that encouraged active participation. Furthermore, when compared to traditional classroom-based small group learning (SGL), students assigned significantly higher Likert scale ratings to WhatsApp-based SGL sessions. This preference highlights the perceived value of digital platforms in supporting flexible, collaborative, and learner-centered approaches in anatomy education.<sup>9,10</sup>

Learners demonstrated positive attitudes toward the use of WhatsApp as a learning tool, and its integration into the language learning process was found to enhance learning outcomes. Notably, both behavioral intention and perceived usefulness of WhatsApp were reported at high levels, underscoring its

effectiveness as a supplementary educational platform.<sup>11</sup>

There is significant improvement in the average marks scored by students after WhatsApp' intervention, in modules assessed by pre and post-test questionnaire.<sup>12</sup>

Similar significant improvements in the mean scores of the experimental (WhatsApp) group, indicating the effectiveness of WhatsApp in enhancing academic performance, further supporting the platform's positive impact on learning outcomes.<sup>13,14</sup>

However, in contrast, a study conducted by Gon et al. found no significant improvement in students' marks following the use of WhatsApp as a teaching-learning modality. These mixed findings highlight the need to consider contextual factors such as subject matter, implementation strategy, and learner engagement when evaluating the efficacy of WhatsApp in education.<sup>12</sup>

Over the past year, the widespread penetration of smartphones has led to the increased use of WhatsApp as a communication platform among student groups, and more recently, between teachers and their students. Educators can easily create class-specific groups on WhatsApp, forming a "simple social network" that facilitates continuous interaction and collaboration. Compared to other technological tools used in education, WhatsApp offers several advantages including low cost, user-friendliness, accessibility, efficiency, and the use of natural language communication. Uniquely, it stands out as a platform that is intuitively adopted by both adults and students, bridging the digital gap that often exists in educational technology adoption.<sup>8</sup>

The results of the study clearly indicate that students in the experimental group benefited significantly from the integration of WhatsApp-based mobile learning activities. Their attitudes toward this learning approach were notably positive. Students reported that the platform facilitated the learning process, aided in overcoming academic difficulties, and enabled them to construct and share knowledge easily. Additionally, it supported independent inquiry and access to relevant information for academic purposes. When compared to the control group, a majority of students in the experimental group perceived

the WhatsApp-integrated learning process as more effective. Overall, the findings suggest that incorporating WhatsApp into teaching and learning is more effective than relying solely on traditional in-class instruction.<sup>13</sup>

The daily use of WhatsApp for medical education may contribute to decreased attention span, potentially due to the distractive nature of smartphones. Based on these findings, the continued development of WhatsApp as a tool for teaching medical reasoning to medical residents appears unjustified. However, its targeted application for other educational purposes such as the sharing of medical images or instructional videos remains to be explored. Future randomized studies are warranted to evaluate its effectiveness in these specific contexts. Blended learning is known to positively impact knowledge acquisition in health professions education.<sup>1</sup>

## CONCLUSION

The use of WhatsApp as a learning tool contributed to enhanced student understanding and retention of anatomical concepts. Students reported a positive perception of WhatsApp as a collaborative, flexible, and accessible platform for academic discussions. Thematic analysis of student reflections revealed increased engagement, active participation, and effective peer-supported learning, highlighting the platform's potential to complement traditional anatomy teaching methods. Some students pointed out that off-topic messages, information overload, and lack of structured discussion at times reduced the effectiveness of the group.

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