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# Peer Tutoring Platform

## Research Document

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South East Technological University Carlow

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## **1. Abstract**

Universities increasingly face challenges in providing timely academic support due to a large number of student groups, limited staff availability, and barriers to student help-seeking. Research indicates that student engagement and perceived support are strongly linked to retention and academic success (Tinto, 2014; Krause and Coates, 2008). Peer tutoring is a traditional and well-respected approach that can improve learning outcomes, self-regulated learning behaviors, teamwork and, most importantly, motivation benefiting both tutors and tutees (Fernández-Martín et al., 2022; Brousseau et al., 2019). Peer Tutoring Platform designed for university students to obtain and provide academic support through creating posts requiring help, messaging, scheduling sessions, feedback and recognition mechanism\*. The MERN\* technology stack was used to allow deploying a full-stack application quickly with real-time messaging to facilitate peer collaboration.

## **2. Introduction**

Undergraduate students, especially first-year students, often struggle with learning complicated academic content. Although formal assistance is available to the student through lectures, tutorials and consultations provided by higher education institutions, the growing numbers of students may limit one-to-one sessions and delay feedback timelines. Research shows that student engagement and perceptions of academic support have a significant impact on retention and academic performance (Tinto, 2014; Krause and Coates, 2008). Peer-assisted learning allows students who come from similar background to collaborate and help each other. Research suggests that peer tutoring improves the performance, confidence and communication skills of both tutor and tutee (Topping, 2001). Motivation, self-efficacy and help-seeking behaviour are also closely related to student engagement (Karabenick, 2003). Nonetheless, students may not seek help because they are simply unsure, anxious or unaware of the available channels. This research document reviews peer tutoring evidence and online tutoring platform design patterns to justify the proposed Peer Tutoring Web Platform and to guide implementation decisions.

## **3. Research Areas**

### **3.1 Academic Need and Educational Rationale**

Student engagement is repeatedly linked to success in higher education (Tinto, 2014). First-year student engagement is particularly essential since learners are adjusting to increased independence and reduced direct guidance compared to secondary education (Krause and Coates, 2008). Peer support mechanisms can strengthen academic belonging, reduce isolation and improve overall participation, creating a sustainable culture within each university.

As a result, the platform prioritizes features that reduce support latency and increase academic belonging while providing discovery of peers, help requests, direct communication, scheduling of private sessions, recognition mechanisms to promote and support user participation.

### **3.2 Peer Tutoring Models and Expected Benefits**

Peer tutoring shows measurable benefits across multiple outcomes. Fernández-Martín et al. (2022) reported statistically significant improvements in indicators of self-regulated learning (e.g., metacognitive self-regulation and environment management) for participants in a structured peer tutoring program, while Brousseau et al. (2019) found peer tutoring can improve teamwork and

group dynamics, increase supervision capacity, and provide positive learning experiences for stakeholders.

In addition, Tenhovirta et al. (2022) identified that effective tutors require not only technical skill but also social, pedagogical, self-regulatory, and reflective capabilities. This implies that the platform should support tutors with structure and guidance.

Those findings informed several design decisions within the project. Firstly, including structured interaction points as request help, accept, schedule sessions, provide feedback for each session rather than purely informal messaging (Tenhovirta et al., 2022). Lastly, building measurable metrics aligned with known benefits (Fernández-Martín et al., 2022).

### **3.3 Web-based Tutoring Platforms**

To begin with, Govaerts et al. (2015) describe an online tutoring platform design including: tutor discovery, booking, profiles, ratings, comments, communication channels, recognition. Mac Raighne (2013) reported that peer-generated questions can increase engagement, and in at least one module showed strong correlation between engagement and exam improvement. Students perceived authoring and answering questions as beneficial. Kuo et al. (2022) found that online peer tutoring for programming improved learning achievement and student attitudes. There are several findings that informed design implications to this project. Firstly, including the core tutoring platform elements: discovery, profiles, messaging, optional scheduling and rating (Govaerts et al., 2015). Secondly, supporting content-based support interactions. (Mac Raighne, 2013). Finally, for computing topics, the platform will encourage sharing of worked examples and explanations attachments, links, structured replies, since tutoring method influences outcomes (Kuo et al., 2022).

### **3.4 Design Implications for the Proposed Platform**

Based on the literature, the system will implement identity and trust signals through user profiles that capture expertise areas and programme supported by reputation indicators such as ratings, written feedback, and visible contribution history. These mechanisms are important for helping users evaluate credibility and for supporting community trust in peer-support environments, as evidenced in online tutoring platform designs and peer tutoring contexts (Govaerts et al., 2015; Tenhovirta et al., 2022).

Direct peer communication will be supported through one-to-one messaging to allow clarification and continued support outside public threads. This aligns with established tutoring platform patterns where direct communication channels enable effective help sessions and sustained guidance (Govaerts et al., 2015).

The platform will implement a structured tutoring lifecycle consisting of request, acceptance, meeting scheduling, completion of the session and post-session feedback. Providing this structure improves accountability, helps tutors manage interactions, and supports reflective improvement rather than relying on ad-hoc conversations alone (Tenhovirta et al., 2022; Govaerts et al., 2015). Finally, the system will include motivation and recognition mechanisms such as points or achievements for sustained contribution, with optional public recognition within the platform. This aims to encourage consistent participation, reinforce prosocial helping behaviours, and support tutor development and community sustainability, which are recurring factors in peer tutoring implementations and tutoring platform research (Tenhovirta et al., 2022; Govaerts et al., 2015).

## **4. Technology Stack Decision**

This area was researched because a chosen stack must support real-time interaction, rapid iterative development and a reliable deployment. Peer tutoring platform is interaction-heavy and must handle posts, comments, messaging, notifications, and continuous user activity efficiently.

The selected solution is the MERN stack which consists of MongoDB\*, Express.js\*, React.js\*, Node.js\* combined with WebSockets\* using Socket.io\*. This stack supports full-stack development and simplifies integration across the application allowing the usage of JavaScript across frontend and backend layers.

To justify this choice, MongoDB is well suited to document-style data that changes during iterative development, which is common in social platforms as features expand gradually within the time. React supports modular, reusable user interface components and enables rapid UI\* iteration. Node.js provides an event-driven runtime that works well with Socket.io for real-time messaging and notifications.

## **5. Existing Work**

There are several competitors in the market that support academic or professional learning, however, they are primarily designed either as commercial tutoring marketplaces or as class discussion.

Profi.ru focuses on connecting clients with paid experts, including education service providers (Profi.ru, n.d.). Brainly supports collaborative learning by allowing students to post questions and receive answers from other users, however, it is worth to mention that it is largely oriented towards school-level learners rather than structured peer tutoring relationships (Brainly, n.d.). Tutorful enables users to search, compare and review private tutors, operating mainly as a paid tutoring marketplace (Tutorful, n.d.). Similarly, Preply connects learners with tutors for paid one-to-one tutoring sessions with a great emphasis on commercial tutoring and language learning (Preply, n.d.). Piazza is also relevant in this context because it is widely used in higher education as a platform for managing class question and answer sessions where students can post questions, collaborate on answers and receive input from instructors and teaching assistants (Piazza, n.d.). Piazza is mainly designed for course-based discussion answering rather than for broader peer tutoring and community-based volunteering.

## **6. Comparison with Existing Work**

The proposed Peer Tutoring Web Platform differs from platforms mentioned previously by focusing on free, community-driven peer academic support within a university context, where students both request and provide assistance.

Profi.ru is primarily designed for paid service provision and does not target volunteering or community learning. Brainly provides similar support but does not offer the structured features required for university peer tutoring, such as organised peer connections, meeting scheduling and gamified academic collaboration. Tutorful is oriented towards purchasing private tutoring rather than enabling mutual peer support within a university community. Preply also operates as a paid tutoring service, which makes it unsuitable for a platform whose purpose is to encourage free student collaboration.

Piazza is closer to the academic environment than these commercial platforms and is useful for course discussion, but it is still mainly built around answering class questions under instructor

guidance. It does not primarily support peer profile discovery, tutoring relationships and peer-support recognition mechanisms beyond course discussion.

## 7. Conclusion

This research shows that a peer tutoring platform specifically targeting university students is educationally justified. The literature reveals that student engagement and rapid educational support are strongly related to student performance especially in early undergraduate study. It also shows benefits for teamwork, motivation and confidence. Additionally, the findings support the development of a platform that enables learners to seek and provide help in a structured and regulated way.

The review of existing online tutoring and discussion platforms also highlighted the importance of user profiles, direct messaging, scheduling, feedback and recognition mechanisms\*, which directly informed the proposed features for the Peer Tutoring Platform. In addition, the technology stack was identified as a suitable technical solution since it supports rapid and evolving full stack development and live interaction.

To conclude, this research document confirms that the proposed system addresses a genuine education need and provides a strong foundation for the functional specification and implementation stages.

## 8. Glossary

Term Name	Term Description
App	Application
Express.js	A Node.js web framework used to define backend routes, middleware and API logic.
feedback and recognition mechanism	A feature that allows users to leave ratings or comments after a tutoring interaction.
Gamification	The use of points, badges, achievements or similar elements to encourage participation and motivation.
MERN	MongoDB, Express.js, React.js and Node.js. The technology stack used to build the project.
MongoDB	A document oriented NoSQL database used to store system data.
Node.js	A JavaScript runtime environment used to execute backend application code.
React.js	A JavaScript library used to build the frontend user interface.
Socket.io	A library used to support live communication between connected users.
Support latency	The delay between a student requesting help and receiving a useful response.
Trust signals	Indicators such as ratings, feedback, profile information and contribution history that help users judge credibility.
UI	User Interface.
WebSockets	A communication technology that allows persistent, real-time data exchange between client and server.

## 9. Reference List

- Brainly. (n.d.). *Brainly: Collaborative learning platform*. [online] Available at: <https://brainly.com> [Accessed 13 February 2026].
- Brousseau, J., Sano-Gélinas, A. and Méthot, J.-F. (2019). *Peer tutoring in a project-based course: Improvements and benefits*. Proceedings of the Canadian Engineering Education Association Conference.
- Fernández-Martín, F., Arco-Tirado, J.L. and Hervás-Torres, M. (2022). The impact of a peer-tutoring program to improve self-regulated learning. *Anales de Psicología*, 38(1), pp.110–118.
- Govaerts, S., Cao, Y., Faltin, N., Cherradi, F. and Gillet, D. (2015). Tutoring teachers – Building an online tutoring platform for the teacher community. *Communications in Computer and Information Science*, pp.39–51.
- Karabenick, S.A. (2003). Seeking help in large college classes: A person-centered approach. *Contemporary Educational Psychology*, 28(1), pp.37–58.
- Krause, K. and Coates, H. (2008). Students' engagement in first-year university. *Assessment & Evaluation in Higher Education*, 33(5), pp.493–505.
- Kuo, Y.-C., Yao, C.-B. and Wu, Z.-Y. (2022). Online peer-tutoring for programming languages based on programming ability and teaching skill. *Applied Sciences*, 12(17), 8513.
- Mac Raighne, A. (2013). *Web-based peer tutoring in science education*. Dublin Institute of Technology.
- Piazza. (n.d.). *Piazza: A question and answer platform for education*. [online] Available at: <https://piazza.com> [Accessed 13 February 2026].
- Preply. (n.d.). *Preply: Online tutoring platform*. [online] Available at: <https://preply.com> [Accessed 13 February 2026].
- Profi.ru. (n.d.). *Profi.ru: Online tutoring platform*. [online] Available at: <https://profi.ru> [Accessed 13 February 2026].
- Tenhovirta, S., Korhonen, T., Seitamaa-Hakkarainen, P. and Hakkarainen, K. (2022). Cross-age peer tutoring in a technology-enhanced STEAM project at a lower secondary school. *International Journal of Technology and Design Education*, 32(3), pp.1701–1723.
- Tinto, V. (2014). Reflective practice: Tinto's South Africa lectures. *Journal of Student Affairs in Africa*, 2(2), pp.5–28.
- Topping, K.J. (2001). Peer assisted learning: A practical guide for teachers. *Educational Psychology in Practice*, 17(3), pp.231–240.
- Tutorful. (n.d.). *Tutorful: Online tutoring platform*. [online] Available at: <https://tutorful.co.uk> [Accessed 13 February 2026].