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Identifying Key Social Persuasive Elements to Enhance Teachers' Technology Self-Efficacy: A Nominal Group Technique Approach

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Abstract: Technological advancements necessitate educators to effectively integrate digital tools in teaching, heavily influenced by their self-efficacy beliefs. This study focuses on identifying and examining key social persuasive elements that enhance teachers' technology integration self-efficacy (TTISE) through a structured Nominal Group Technique (NGT) approach. Previous studies have underscored the influence of social persuasive strategies, including peer modelling, verbal persuasion, and shared experiences, on enhancing TTISE. The objective of this study is to determine the most influential social persuasive elements that can fortify TTISE among teachers, aiming to provide actionable insights for educational leaders and policy-makers. Utilizing the NGT, this research engaged seven experts in a structured consensus-building process online. Participants identified, discussed, and ranked key strategies based on their potential impact on TTISE. The findings reveal that constructive feedback and leadership encouragement are paramount in enhancing TTISE. These elements were followed by peer support networks and professional development, all recognized for their critical roles in fostering a collaborative and supportive teaching environment. The study highlights the importance of recognizing and celebrating teachers' technological achievements to further motivate and reinforce positive integration behaviors. The findings suggest that a supportive environment fostered through social persuasion is essential for enabling teachers to successfully integrate technology in their pedagogical practices, thereby advancing educational innovation. As, the conclusion, effective social persuasion, encompassing feedback, encouragement, collaboration, and recognition, significantly boosts TTISE. This enhances teachers' willingness and ability to incorporate technology into their pedagogical practices, essential for educational advancements in the digital age. Future research should explore long-term impacts of these strategies and their adaptability across different educational contexts

Keywords: Teacher's Technology Integration Self-Efficacy, Self-efficacy, Nominal Group Technique, social persuasion

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INTRODUCTION

In the fast changing educational landscape, incorporating technology into teaching has become critical for improving both instructional approaches and student learning outcomes. Despite its acknowledged relevance, the effective adoption of technology in classrooms is strongly dependent on teachers' self-efficacy in using technology (Holden & Rada, 2011). Self-efficacy, defined as an individual's belief in their ability to complete tasks and achieve goals (Bandura, 1997), is an important factor in how teachers incorporate technology into their pedagogy.

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According to research, instructors who have a high level of self-efficacy are more likely to adapt and use technology in new and educationally beneficial ways (Barton & Dexter, 2020). Therefore, boosting teachers' technology integration self-efficacy (TTISE) is crucial for educational advancement.

TTISE among instructors not only promotes individual educator improvement but also promotes systemic educational reforms. When teachers believe in their ability to use technology effectively, they are more likely to explore and integrate digital technologies into their instruction, resulting in more personalised and engaging learning experiences for students (Tschannen-Moran & Woolfolk Hoy, 2001). Furthermore, high self-efficacy helps teachers overcome potential barriers to technology use, such as resistance to change or unfamiliarity with new tools, allowing for a more dynamic adaptation to educational technology trends (Heath, 2017).

Insufficient TTISE might result in a fragmented implementation of technology, with only a fraction of pupils benefiting from technological improvements, aggravating educational disparities (Bingimlas 2009). This can lead to a lack of engagement and lower accomplishment among students, especially in settings where technology could considerably aid learning (Anderson & Maninger, 2007). Thus, developing strong TTISE is critical not only for improving individual teacher performance, but also for attaining systemic educational changes and closing the digital divide in learning communities (Valtonen et al., 2015).

Problem Statement

Social persuasive strategies, as revealed in psychological and educational studies, have significant effects on self-efficacy levels (Daly & Thompson, 2017). These strategies depend on social interactions to influence perceptions and behaviours through persuasion and modelling (Bandura, 1997). In the context of educational technology, such tactics may include peer modelling of technology use, verbal persuasion from credible colleagues, and shared experiences with successful technology integration (Glazer et al., 2005). Previous research has found that these social persuasive factors can significantly increase instructors' confidence and ability in integrating technology (Jones & Dexter, 2014). However, the most influential aspects of social persuasion remain poorly understood, necessitating an intense investigation to discover and improve these characteristics for teacher development.

As technological developments occur at a rapid pace, it is becoming increasingly important to discover which elements of social persuasion originate, maintain, and promote continuous teacher involvement with digital technologies in the classroom. This extended inquiry will make a substantial contribution to the field by providing nuanced insights that can be used to influence the establishment of tailored professional development programs and legislative efforts aimed at maximising the pedagogical benefits of technology in education.

The aim of this study is to identify and examine the key social persuasive elements that can enhance TTISE, using a Nominal Group Technique approach.

REVIEW OF LITERATURE

The literature on social persuasion as a vital component in boosting TTISE lists a number of effective strategies, most of which are based on social learning theories. According to Bandura's social cognition theory, four major factors shape self-efficacy: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states (Bandura, 1997). These sources play an important part in TTISE. Mastery experiences are earned by effective use of technology in the classroom, whereas vicarious experiences entail witnessing

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peers successfully integrating technology, which boosts the observer's confidence in their own abilities. As previously said, social persuasion comprises receiving encouragement and positive feedback from peers and leaders, which can dramatically boost a teacher's confidence in their technological abilities. The physiological and emotional states allude to the teacher's stress levels and mood, which can effect their self-efficacy in terms of technology utilisation (Atabek, 2020).

Gomez et al., (2020) define TTISE as the teachers' belief in their ability to effectively use and integrate technology into teaching practices. Holden and Rada (2011) further on this, stating that TTISE is driven not just by individual confidence but also by the broader educational setting, which includes the availability of support systems and collaborative opportunities. Social persuasive strategies like these play an important part in increasing instructors' confidence in using technology by reducing the uncertainty they may feel when trying with unfamiliar technologies.

Additional research emphasises the value of leadership encouragement and peer support networks. When school administrators aggressively encourage teachers to experiment with new technology and publicly acknowledge their efforts, they build an environment of innovation and acceptance of technological integration (Howard et al., 2018). Leaders may strengthen the effects of social persuasion by proving teachers' work through public recognition, such as during staff conferences or in newsletters, which not only encourages the recognized teachers but also inspires others to follow suit. Peer support networks, in which teachers share their experiences, challenges, and accomplishments, give an additional layer of reinforcement. Support from peers who understand the practical constraints of teaching using technology can be particularly beneficial (Mintzes et al., 2013).

Finally, mentorship and training programs that emphasis positive reinforcement can significantly improve TTISE (Burger, 2023). Structured professional development sessions that build on teachers' existing abilities and allow them to recognise technical accomplishments are critical for increasing their confidence. These sessions should include incentives and encouragement to continue trying with new technologies, as well as, if possible, mentorship or coaching programs. Mentors who provide ongoing support through regular check-ins assist teachers stay motivated and handle any self-doubt they may experience (Wang et al., 2004). Celebrating teachers' technical triumphs increases their self-efficacy and sets a positive example for others, boosting collective trust in technology integration in educational settings.

METHODOLOGY

This study uses the Nominal Group Technique (NGT), a structured method that improves group decision-making, to investigate expert consensus on effective social persuasive strategies for increasing technology integration self-efficacy among teachers (Delbecq et al.,1975).

The study included seven specialists on ways for improving the TTISE. Because it is currently impractical to gather experts in person, researchers conduct NGT sessions online using Google Meet. A two-hour session was conducted. Experts were collected, and the NGT approach was used to brainstorm ideas and solutions based on expert opinions. At the end of the session, the researcher performed a specific calculation utilising the NGT method to acquire data that addressed the study's objectives.

NGT Techniques Step

NGT is an organised approach of getting collective feedback on a specific subject. Delbecq et al. first proposed a participatory technique for social planning in 1975, which included

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exploratory research, public involvement, interdisciplinary collaboration, and proposal evaluation. NGT has been employed in a variety of settings over the years, most notably in social science and health studies, but it has also been used in educational research. This strategy works particularly well in groups of strangers, balancing power relations and ensuring equitable participation. It aids in the identification of challenges, solution research, and priority setting, making it a useful tool in group process of decision-making.

NGT normally consists of the following five steps:

1. During brainstorming, participants work independently to write down their replies to a stimulus question.
2. Round Robin session: Participants share a single idea and record it on a large flip-chart. It is not permissible to dispute the ideas. Sheets that have been finished are pinned to the wall so everyone can view them. The facilitator of the group continues to summon people until each suggestion have been recorded or the group decides that they have created enough ideas.
3. Participants discuss each idea on the list to ensure they understand its meaning.
4. Voting: Participants select key concepts, rank their choices (optional), vote on a flipchart, and analyse the voting results. It promotes authentic outcomes and dedication to them by requiring anonymous voting in addition to the criteria listed above.
5. NGT records all inputs and accepted changes on flipchart pages, creating a permanent record of group process and outcomes. When displayed, these sheets allow a group to easily take up where it left off at a previous meeting. They also serve as an effective means of briefing individuals who missed all or part of the meeting (Fox, 1989).

Sampling

There is substantial dispute over the optimal sample size when conducting NGT investigations. According to some researchers, NGT can be conducted on a single cohort or a big group (Dobbie et al., 2004), but it can also be divided into small groups to allow for effective communication based on the demands of the study. For this reason, the following sample sizes have been utilised by prior studies, as stated in Table 1. According to Harvey and Holmes (2012), it is sufficient to have 7 to 10 participants as experts in a NGT discussion. As a result of the preceding reference, the researcher chose seven experts to engage in the NGT procedure of this study. Given the current circumstances that limit contacts, this number is deemed adequate for this investigation.

Table 1. Suggestion of experts number by researchers

Author	Sample
Van de Van and Delbecq(1971)	5-9 experts/ participants
Horton (1980)	7-10 experts/participants
Harvey and Holmes	6-12 experts/participants
Abdullah and Islam (2001)	7-10 experts/participants
Carney et al (1996)	Min 6 experts/ partcipants

Source : *Musthapa et al., 2022*

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RESULTS AND DISCUSSION

Social persuasion is an important factor in increasing TTISE since it includes verbal support and feedback from peers, mentors, and leaders. Positive reinforcement and constructive comments provide teachers the courage to experiment with and incorporate digital resources into their lessons. When teachers are encouraged and validated for their work, their fear and aversion to new technology decreases, creating a conducive environment for growth. Social persuasion helps instructors develop resilience by supporting their conviction in their ability to overcome obstacles and successfully integrate technology into their classrooms. Furthermore, social persuasion fosters teamwork and motivation by making teachers feel supported by their professional community, encouraging them to experiment with and learn from new technology. The following are the expert opinions and suggestions to boost TTISE by social persuasion that is constructive feedback, encouragement from leadership, peer support networks,professional development,celebrating success and mentorship and couching.

Table 2. List of strategies to develop teacher's technology integration self-efficacy by social persuasion

No	Expert opinion and suggestions	Source
1	**Constructive Feedback:** Provide teachers with specific, positive feedback on their efforts to integrate technology. Highlighting what they are doing well can reinforce their confidence and motivate them to continue improving.	Expert
2	**Encouragement from Leadership**: School leaders and administrators should actively encourage teachers to experiment with and adopt new technologies. Public recognition of teachers' efforts in staff meetings or newsletters can validate their work and inspire others.	Expert
3	**Peer Support Networks:** Establish peer support groups where teachers can share experiences, challenges, and successes. Encouragement from colleagues who understand the context and challenges can be particularly impactful.	Expert
4	**Professional Development:** Incorporate sessions in professional development programs that focus on building confidence and providing positive reinforcement. Trainers and facilitators should emphasize teachers' potential and capabilities in using technology.	Expert
5	**Celebrating Successes:** Create opportunities to celebrate technological achievements, such as showcasing successful projects or innovations in school events. This not only boosts the confidence of those involved but also sets a positive example for others.	Expert
6	**Mentorship and Coaching:** Pair teachers with mentors or coaches who can provide ongoing encouragement and support. Regular check-ins and discussions can help maintain motivation and address any self-doubt.	Expert

The results from NGT expert's consensus on social persuasion aspects yielded numerous significant tactics for increasing TTISE. Table 3 displays the expert's assessment of overall solution scores for social persuasion elements. The investigation found that all of the elements tested are suitable for use. These studies yielded a value of more than 70% was required for the percentage (Dobbie et al., 2004; Mustapha et al., 2022). Based on total scores and expert voter opinion, the top-ranked elements were Constructive Feedback and Leadership Encouragement,

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both of which received the highest possible score (100%) and were judged the most important methods. These factors were closely followed by Peer Support Networks and Professional Development, both of which received 85.71% support, indicating their importance in creating a collaborative and supportive atmosphere for educators. Finally, 76.19% agreed that Celebrating Successes is crucial, emphasising the value of recognising and celebrating teachers' technical achievements to further motivate and reinforce positive behaviours. Table 4 shows the analysis result.

Table 3. NGT result for Social Persuasion

Items / Elements	Voter 1	Voter 2	Voter 3	Voter 4	Voter 5	Voter 6	Voter 7	Total item score	Percentage	Rank Priority	Voter Consensus
Constructive Feedback	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**21**	**100**	**1**	**Suitable**
Encouragement from Leadership	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**21**	**100**	**1**	**Suitable**
Peer Support Networks	**3**	**2**	**2**	**3**	**2**	**3**	**3**	**18**	**85.71**	**2**	**Suitable**
Professional Development	**3**	**2**	**3**	**3**	**2**	**3**	**2**	**18**	**85.71**	**2**	**Suitable**
Celebrating Successes	**2**	**2**	**2**	**3**	**2**	**3**	**2**	**16**	**76.19**	**3**	**Suitable**
Mentorship and Coaching	**2**	**3**	**2**	**3**	**2**	**2**	**2**	**16**	**76.19**	**3**	**Suitable**

This study used NGT to identify important social persuasive aspects that increase TTISE. With the participation of seven experts in educational technology disciplines, the agreement identified numerous key aspects. First and foremost, constructive feedback and encouragement from leadership were recognised as an important method in which teachers experience using technology to promote a helpful learning environment. This is in line with the study showing that competent leadership fosters the use of technology to enhance educational inclusion and pedagogical practices (Villalobos-Egaña et al., 2023). Furthermore, the importance of authoritative support, such as endorsements from school administrators and policymakers who advocate for technology integration, appeared as critical in increasing teachers' confidence and readiness to use technology into their teaching practices. Teachers experience greater confidence when they feel supported by their school environment, which includes access to necessary resources and a supportive administrative team (Keese et al., 2021).

The experts also recognised the value of customised professional development programs that cover not just technological abilities but also the pedagogical issues of incorporating technology into the curriculum. These programs should be tailored to the individual needs of instructors as well as the context of their educational settings. Providing technology-focused professional development is critical for improving teachers' technological pedagogical content knowledge (TPACK), which in turn improves their perceived usefulness and simplicity of use of new technologies like AR and VR (Jang et al., 2021). Furthermore, the presence of

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technology champions or mentors in schools was found to significantly increase self-efficacy. These individuals serve as role models and offer on-the-spot help, lowering anxiety and resistance to technology use (Craig & Craig, 2021).

These findings indicate a broad consensus among experts on the importance of constructive feedback and leadership encouragement in promoting TTISE in teachers. The consistency of high ratings and positive consensus demonstrates the perceived efficiency of these social constructs in boosting teachers' confidence and capacities in incorporating technology into their teaching practices. This amount of agreement among varied voters demonstrates the constructs' resilience and relevance in educational contexts, particularly in attempts to improve digital leadership and teacher development.

CONCLUSION

Finally, social persuasion is critical in increasing TTISE, especially in educational situations where digital technologies must be effectively integrated. The findings of this study, which employs a Nominal Group Technique (NGT) approach, show that key social persuasive elements such as constructive feedback, leadership encouragement, peer support networks, professional development, and celebrating successes are critical in fostering a supportive culture for technology use. Experts unanimously agreed that the most influential factors were constructive feedback and leadership encouragement. These tactics are critical because they give teachers with direct validation and incentive, lowering the anxiety and resistance that is often associated with implementing new technologies.

Peer support networks and professional development were also given great priority. Both parts emphasise the collaborative nature of learning and progress, with instructors gaining tremendously from sharing their experiences and getting structured, continuous training. Professional development workshops that emphasise positive reinforcement and provide hands-on mastery experiences foster a climate suitable to investigating and implementing new technologies, hence increasing self-efficacy. These networks not only minimise feelings of isolation, but also foster a collaborative climate in which teachers feel more at ease discussing issues and pursuing solutions.

Finally, recognising triumphs is a crucial, albeit slightly underemphasised, aspect. Recognising technical achievements can motivate teachers and create a positive feedback loop that encourages continual growth. Celebrating modest victories also fosters the assumption that instructors can master technology, resulting in greater overall incorporation into classroom activities.

Future research should investigate the long-term effects of these identified social persuasive methods on instructors' technology integration practices. Furthermore, investigating the differential effects of these tactics across varied educational contexts and cultures may provide deeper insights on customising support mechanisms for technology integration. Studies that identify specific barriers to technology integration despite the presence of social persuasive elements and explore strategies to overcome these barriers is also encourageable.

Overall, social persuasion, in the form of feedback, encouragement, collaboration, and acknowledgement, is an effective strategy for enhancing instructors' confidence and desire to incorporate technology into their teaching practices. The study's findings offer educational administrators a strategic blueprint for cultivating a good, technology-driven culture in schools.

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