Comparative Examination of the Impact of TAGs on Professional Development: Satisfaction Levels among EMI Science and EFL Teachers

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Article information	Abstract
	The present study looks into Vietnamese teachers' satisfaction levels with their participation in Teacher Activity Groups (TAGs) and examines how they feel about the impact of these collaborative professional development (PD) activities on their professional advancement. A particular focus of this study is the potential role of teachers' subject specialization, specifically Science taught via English as a Medium of Instruction (EMI) and English as a Foreign Language (EFL), in shaping their satisfaction with TAGs. Using a quantitative approach, data were gathered via a questionnaire designed to assess teachers' satisfaction with their involvement in TAGs. The participants included 103 EFL teachers and 44 EMI Science teachers. The Independent Sample t-tests were used to compare the mean satisfaction scores of the two distinct teacher groups. The findings showed generally positive views of TAGs, with no significant difference in satisfaction levels found between the EMI Science and EFL teacher cohorts. However, a clear difference emerged regarding how engaging the program was and how suitable the training duration felt, with EMI Science teachers expressing higher satisfaction levels compared to their EFL counterparts. These outcomes suggest that how well the program content fits the teachers' subject area, along with their expectations and preferences, affects how satisfied they feel with TAGs. This study enriches the comprehension of collaborative PD activities and proffers implications for educators, policymakers, and researchers looking to improve teacher PD in Vietnam.

INTRODUCTION

Contextual background

The critical role of professional development (PD) in strengthing educators' pedagogical competence - as demonstrated in studies by Lei and Medwell (2020), Oo et al. (2023), Ozer

and Popp (2022), and Yaakob et al. (2020) - is widely acknowledged, with positive implications for overall educational quality. Teacher Activity Groups (TAGs) are defined as collaborative PD networks where educators come together to discuss, learn, and enhance their teaching practices. These groups are increasingly recognized as crucial for modern educational development, especially in contexts where innovative teaching methods and cross-cultural understanding are essential. There is an increasing focus on working together for professional learning (Koukis & Jimoyiannis, 2019), as seen in TAGs. Such activities aim to build a sense of shared learning and support among teachers (Chickering et al., 2015).

Within the specific context of Vietnamese education, primary and secondary educational institutions face many challenges, especially as they try to meet changing student needs and adapt to ongoing educational reforms (Hung & Thuy, 2021; Nguyen & Trent, 2020; Nguyen et al., 2020). This is particularly pertinent in the context of English Language Teaching (ELT) and English as a Medium of Instruction (EMI) policies in Vietnam, which require teachers to be confident in both their language and teaching skills.

Furthermore, science teachers are also expected to teach through English, which can be very challenging (Nguyen, 2020). To support these requirements, TAGs in Vietnam have emerged as a critical PD tool. They are designed to help Vietnamese teachers deal with the demands of teaching in English. To manage these challenges, TAGs, as collaborative PD efforts, are seen as a practical way forward, giving teachers a space to share ideas, teaching strategies, and new approaches (Xulu, 2018). These gatherings provide opportunities for teachers to work together, reflect on their teaching, and grow professionally (Tichenor & Tichenor, 2019; Zeng & Day, 2019).

The TAGs project is an international partnership between a reputable organization from England, a language center in Wales, and a prestigious higher education institution located in the Mekong region of Vietnam. This partnership reflects a concerted effort to align international expertise with local educational demands, underscoring the necessity and relevance of TAGs in the Vietnamese context. The primary objective of this project is to foster the PD of K12 EMI Science teachers and English as a Foreign Language (EFL) teachers. The project utilizes online platforms to facilitate a seamless cross-cultural exchange of knowledge, teaching techniques, and experiences. English-native speakers from the first two organizations, the English institution, and the language center in Wales work not as teachers, but as facilitators, helping lead discussions that allow participating teachers to share their ideas and experiences. Complementing this arrangement are Vietnamese English lecturers from the Vietnamese institution who assist these topic guides, offering a richer contextual understanding and adding a local perspective to these conversations. The involvement of these diverse entities highlights the multifaceted nature of TAGs, integrating global perspectives with the specific needs of Vietnamese educators. The TAGs project, with its unique three-way collaboration and focus on experiential sharing and guided discussions, presents a refreshing approach to teacher development. It encourages teachers to take part, learn from each other, and improve their teaching through shared experiences.

Purpose of the study

Understanding these potential differences is crucial, as TAGs are designed to serve a broad range of PD needs. EMI Science teachers may seek support in subject-specific pedagogy, bilingual classroom management, and strategies for simplifying complex content (Farrell, 2020; Prabjandee & Nilpirom, 2022), while EFL teachers may prioritize training in language teaching methodologies, assessment, and communicative competence (Ahmed et al., 2019; Lap & Thao, 2021). Additionally, the integration of content and language instruction presents unique challenges for EMI educators, often requiring more specialized PD (Gustafsson, 2020).

Despite the growing popularity of TAGs, research examining their effectiveness and teacher satisfaction—particularly across different subject areas such as EMI Science and EFL—remains limited. This study addresses this gap by investigating the following research question: "*Are there statistically significant disparities between the satisfaction of EMI Science teachers and EFL teachers with regards to TAGs?*" The aim is to uncover how satisfaction levels may vary between these two groups, who, despite both teaching in English, fulfill fundamentally different educational roles.

LITERATURE REVIEW

Professional development activities

PD initiatives are integral to the advancement and effectiveness of teachers, providing opportunities for ongoing learning, skill development, and teaching improvement (Guskey, 2003; Guskey & Yoon, 2009). PD activities are designed to meet teachers' changing needs in an ever-evolving educational environment (Zein, 2017). Such initiatives include a wide range of activities such as workshops, seminars, conferences, cooperative learning cohorts, coaching, mentorship, and TAGs (Gümüş & Bellibaş, 2021).

The main goal of these efforts is to help teachers gain new knowledge, capabilities, and teaching strategies while also encouraging reflection and a habit of continuous improvement (Boei et al., 2015). Research shows that well-designed PD can improve teaching practices (e.g., Mohamad Hasim et al., 2022; Quick et al., 2009). Studies also show that focused PD programs lead to improved subject matter comprehension, refined instructional methods, and amplified classroom management skills (Nutta et al., 2020). Effective PD gives teachers chances to learn actively, observe good practices, and receive helpful feedback and support from colleagues and facilitators (Archambault et al., 2010).

Collaborative PD programs, such as TAGs, have drawn increasing attention in recent years. TAGs deliver a structured platform for teachers to collaborate, share their own experiences, and engage in thoughtful discussion (Lipscombe et al., 2020). Studies support the idea that such collaborative ventures augment pedagogical learning and constructively shape instructional practices (Darling-Hammond et al., 2020). Through participation in collaborative activities,

teachers expand their teaching strategies, gain new insights, and adjust their methods based on shared knowledge and experience (Darling-Hammond & Bransford, 2007).

A range of factors affects how successful PD initiatives are. Research highlights the importance of ongoing participation, active learning, and matching PD content with teachers' actual needs and goals (Ottenbreit-Leftwich et al., 2010). Ongoing support and follow-up are also important to help teachers apply what they learn in their classrooms (Putnam & Borko, 2000). Time, resources, and support from schools are also key to making PD work and last (Desimone, 2002).

Ultimately, the impact of PD activities should be seen in the improvement of student outcomes. Studies have found links between teacher engagement in high-quality PD activities and enhanced student achievement (Baker et al., 2018). Effective PD contributes to higher student engagement, better classrooms, and the use of research-backed teaching methods that help student learning outcomes (Nishimura, 2014).

What differentiates TAGs from other forms of collaborative PD activities?

In the current study, TAGs, a form of collaborative PD, are meant to support teamwork and shared problem-solving among teachers (Lipscombe et al., 2020). By creating a supportive space for learning, collaborative PD activities help teachers feel more confident and motivated (Bray-Clark & Bates, 2003). Their success depends on trust, respect, transparent dialogue, and congruence with teachers' professional needs. Despite challenges like limited time and heavy workloads, including TAGs in existing PD plans, providing resources, and working around teachers' schedules can enhance their effectiveness.

Furthermore, TAGs exemplify an innovative form of collaborative PD, with some important differences from traditional models. Firstly, TAGs encourage active involvement and two-way discussion, unlike many one-sided traditional PD formats (Dickson et al., 2021). The main value of TAGs lies in the sharing of practical experience, helping teachers apply what they learn in real classrooms. Secondly, TAGs often start from a need to solve real, everyday problems in teaching. This makes them more relevant and useful than some theory-heavy traditional PD programs (Njenga, 2023). Thirdly, TAGs promote self-directed learning, allowing teachers to shape their own paths. Therefore, it is different from the one-size-fits-all nature of many traditional PD formats (Waitoller & Artiles, 2013). Fourthly, the effectiveness of TAGs depends on building a trusting and supportive professional community. The group dynamic helps teachers stay engaged and involved (Bond & Lockee, 2018), something that is often missing from other types of PD. Fifthly, TAGs take place over time, allowing teachers to learn, try out new ideas, reflect, and make changes (Saint-Onge & Wallace, 2012). This ongoing process supports lasting growth, unlike one-off workshops. Sixthly, TAGs are built within local schools or districts, making sure PD activities fit specific goals and available resources (Vangrieken et al., 2017). This local relevance is often missing from PD designed by outsiders.

Most prominently, in this study, the role of native English speakers as facilitators adds a unique aspect to how the TAGs work. Indeed, the use of native English speakers to lead PD sessions is a key feature of this project. This might influence how satisfied teachers feel, though more

research is needed. Operating as both resource persons and facilitators, native English speakers can share useful knowledge about teaching English and help deepen the learning experience (Richards & Rodgers, 2014). Their presence creates a more authentic language environment and helps teachers understand different cultures (Truong & Murray, 2020). Native English speaker facilitators can explain real-life uses and cultural details that are hard to get through traditional PD (Prabjandee, 2020). Their role goes beyond teaching language – they also support and guide teachers. They help create a space where teachers feel encouraged to reflect, ask questions, and try new ideas (Mann & Walsh, 2017). This two-way relationship between facilitators and teachers helps boost growth and makes the learning experience more meaningful. Consequently, TAGs offer a useful way to approach PD and may avoid some of the common problems found in traditional formats.

Five-tiered evaluation of the efficacy of PD activities

To examine teacher satisfaction in PD, this study draws on Guskey's (2000) Five-Tiered Evaluation Model, which offers a comprehensive framework for assessing the effectiveness of professional development. The first level focuses on participants' reactions, including their engagement, perceived value, and overall satisfaction with the PD experience (Bragg et al., 2021; De Vries et al., 2014; Main & Pendergast, 2015). Positive responses at this level are seen as important indicators of meaningful engagement. The second level addresses what participants learn - new knowledge, skills, and teaching strategies - which are essential to quality PD (Hord & Tobia, 2015). Evaluation here involves measuring content understanding and how well teachers can apply what they have learned (Guskey, 2000). The third level considers how the organization supports PD, including resources, alignment with school goals, and opportunities for collaboration. Strong institutional support can promote sustained change and enhance satisfaction (Bryk, 2010; Gao, 2022; Zhou et al., 2022). The fourth level evaluates how teachers apply their new knowledge in practice, with reflection, practical use, and implementation support playing important roles in reinforcing learning (Darling-Hammond & McLaughlin, 1995; Earley & Porritt, 2014). The fifth and final level focuses on the ultimate goal of PD—improvements in student learning. Research shows that effective PD can lead to better student outcomes, which in turn contributes to teacher satisfaction (Guskey, 2000; Shagrir, 2011). Taken together, Guskey's (2000) model helps evaluate multiple aspects of PD and is particularly useful for understanding satisfaction with collaborative learning models like TAGs. When applied to this study, the model offers a way to assess how teachers respond to TAGs, what they learn, how they are supported, how they apply their learning, and how these efforts may influence student learning. It provides a useful structure for examining whether TAGs meet teachers' professional needs and contribute to their growth and teaching effectiveness.

Theoretical frameworks for unpacking teacher satisfaction

This investigation employs a theoretical framework that is underpinned by three key theories: The Adult Learning Theory (ALT), the Community of Practice (CoP) Theory, and the Pedagogical Content Knowledge (PCK) Theory. The ALT, attributed to Zepeda et al. (2014), provides a critical perspective for comprehending the intrinsic motivations and self-directed nature of adult learners. It assumes that adults are autonomous in their learning and can effectively

utilize their prior experiences to inform their learning processes. This theory provides crucial insights into the ability of TAGs to create an environment that fosters self-directed learning among teachers. It essentially serves as the basis for exploring how TAGs, by catering to the intrinsic motivations and self-directed learning inclinations of teachers, may significantly enhance satisfaction levels and, subsequently, improve PD outcomes. Guskey's (2000) model, with its emphasis on evaluating participants' reactions, complements this by providing a framework for assessing how TAGs meet the autonomous and experiential learning needs of adult learners, as postulated in the ALT.

The CoP Theory, posited by Mak and Pun (2015), forms the second component of the theoretical framework. CoP Theory emphasizes learning as a social process, driven by interaction, collaboration, and knowledge exchange within a community sharing a common interest or practice. This theory is especially useful for looking at how TAGs encourage teachers to work together and share knowledge. It provides a theoretical foundation for investigating how the collective engagement within TAGs could foster a supportive environment, promoting knowledge exchange and collaborative problem-solving. This could potentially influence teachers' satisfaction and professional growth. Incorporating Guskey's (2000) model, particularly its focus on organizational support and change, the study explores how the social learning environment of TAGs aligns with the principles of CoP Theory.

Lastly, to address differences among teachers of different subjects, the PCK Theory is integrated into the theoretical framework. PCK Theory, as introduced by Shulman (1987), says that good teaching combines knowing the subject well and knowing how to teach it effectively. As such, teachers instructing different subjects, such as EMI Science subjects and the EFL one, may have varying experiences, challenges, and perceptions. Consequently, PCK Theory provides the basis for analyzing potential disparities in perceptions and experiences among teachers of various disciplines participating in TAGs. By incorporating this theory into the theoretical framework, the study aims to shed light on potential differences in how teachers of diverse subjects perceive, experience, and benefit from their participation in TAGs. The inclusion of Guskey's (2000) model, especially its emphasis on participants' use of new knowledge and skills and student learning outcomes, aligns with PCK Theory by evaluating how the subject-specific PD offered in TAGs impacts teachers' pedagogical content knowledge.

METHODS

TAGs in this study

The TAGs in this study were structured as a year-long program, involving a series of interconnected activities and interactions among participating teachers. Over the course of the year, teachers engaged in various collaborative and instructional activities under the guidance of native English-speaking instructors. These activities included, but were not limited to, participating in structured discussions on online platforms, where teachers could share experiences, challenges, and opportunities encountered in their teaching practices. This forum served as a space for collaborative learning and peer support, enabling teachers to

exchange ideas and strategies. Furthermore, the teachers were required to attend regular virtual sessions, where they followed structured modules prepared by the instructors. These sessions focused on enhancing pedagogical skills, language proficiency, and teaching methodologies specific to their subjects, either EMI Science or EFL. The frequency of these sessions was planned to keep teachers engaged while still fitting around their busy schedules. In addition to the structured sessions, teachers were encouraged to actively participate in community-building activities. This included sharing personal insights, strategies, and experiences with the wider group, fostering a sense of community and collaborative learning. The TAGs also encouraged teachers to implement new strategies in their classrooms and then talk about what worked or did not, so others could learn from their experience. The entire TAGs process, lasting one year, was carefully tracked and reviewed. This included recording the frequency of online discussions, the nature and content of sessions conducted by the instructors, and the extent of participation and engagement by the teachers. This helped provide a clear picture of how the TAGs worked and how teachers felt about the experience.

The activities within the TAGs were planned based on the core principles of TAGs, which emphasize collaborative learning, ongoing PD, and reflective practice. The rationale for these activities is derived from the core elements of TAGs principles, which focus on enhancing teaching efficacy through continuous engagement, peer learning, and practical application. The structured discussions on online platforms, for instance, embody the TAGs principle of collaborative learning. By sharing experiences, challenges, and opportunities, teachers not only learn more themselves but also help others grow. This collaborative environment is vital for professional growth and is a key element in the TAGs methodology. The requirement for teachers to attend regular virtual sessions under the guidance of native English-speaking instructors aligns with the TAGs principle of ongoing PD. These sessions, designed to improve pedagogical skills, language proficiency, and teaching methodologies, ensure that teachers are not only updated with the latest educational strategies but are also competent in implementing them effectively. Additionally, the emphasis on community-building activities and the encouragement for teachers to implement new strategies in their classrooms reflect the TAGs principle of reflective practice. By engaging in these activities, teachers are able to reflect on their teaching practices, assess the impact of new strategies, and share their experiences with their peers. This process of reflection and sharing is essential for the iterative improvement of teaching methods and outcomes. Therefore, the activities within the TAGs are closely tied to its goals of building a helpful, active, and useful learning space for teachers. The purpose of these activities is to facilitate a comprehensive PD experience that is consistent with the goals of TAGs - to enhance the quality of teaching and, consequently, student learning outcomes. The year-long duration of the TAGs, along with its many activities, is meant to help teachers build long-lasting skills and confidence in their teaching.

Research design

The methodology used in this study is based on a survey, not an experiment. This distinction is crucial, as the purpose of the study is not to experimentally determine the effects of TAGs on the satisfaction levels of PD activities, but rather to survey and analyze existing satisfaction levels among teachers who have participated in TAGs. In implementing a survey methodology,

the study utilizes a questionnaire as its central instrument for data collection. This approach aims to gather numerical data from a large group of teachers (103 EFL teachers and 44 EMI Science teachers) to understand their satisfaction levels with TAGs. The survey format makes it possible to collect consistent data from many participants, which supports the statistical analysis.

The primary aim of the survey is to explore the existence of any statistically significant differences in satisfaction between EMI Science teachers and EFL teachers who have participated in TAGs. It is important to clarify that this methodology does not involve manipulating variables or creating experimental conditions to test the impact of TAGs. Instead, it focuses on gathering and analyzing data from teachers' existing experiences with TAGs to draw insights into their satisfaction levels. Thus, the study is grounded in a survey research design, enabling the researchers to collect extensive data on teacher satisfaction levels post-participation in TAGs and analyze this data to answer the research question. The scale and nature of the questionnaire-based survey, coupled with the focused nature of the study within the Vietnamese educational context, affirm its suitability as a quantitative research method for this particular inquiry.

This methodology allows for a detailed look at possible differences in satisfaction levels related to the subject domain among the teachers. The data from a large group of teachers gives a strong base for analysis and helps make the findings more reliable. The size of the sample, coupled with the systematic approach of quantitative analysis, aligns with the objectives of the study to produce meaningful insights into the impact of TAGs on teacher satisfaction in distinct educational settings.

Participants

The study's participants were chosen using purposive sampling. Researchers first reached out to Vietnamese schools by email or phone to explain the purpose and scope of the study. A comprehensive catalogue of K-12 teachers, either currently engaged in or previously involved with TAGs, was obtained from these educational institutions. Subsequently, an informational email was then sent to all potential respondents, explaining the study's goals, the researchers' affiliations, the voluntary nature of their participation, and how data would be handled and protected. Those who expressed interest were included in the study.

While the study considered a variety of demographic factors, including age, gender, educational background, and subject matter expertise, it is important to note that teachers' experience with TAGs may have influenced the results. The diversity in the participants' experience with TAGs, ranging from beginners to more experienced participants, introduces a variable that was not explicitly controlled for in this study. This decision was made based on a few key points.

Firstly, the primary focus of the research was to explore the impact of TAGs on teacher satisfaction across different teaching subjects, rather than to assess the influence of prior experience with TAGs. Including teachers with different levels of experience was seen as important for getting wide range of viewpoints, which helps build a more complete picture of

how TAGs work. Secondly, if the study had only included teachers with similar experience, the results would have applied to a smaller group. By encompassing a wide range of experiences, the study provides a more holistic view of TAGs' effectiveness across different stages of teachers' professional journeys. This inclusivity enhances the generalizability of the study's results to a broader population of teachers. Additionally, the differences in experience among participants may reveal how TAGs are seen and used differently depending on where teachers are in their careers. This diversity adds important depth to our understanding of how TAGs work in different teaching contexts.

In line with ethical principles, an informed written consent was secured from all the participants before the commencement of data gathering. The consent document clearly explained participants' rights, including the right to withdraw at any time without consequences, confidentiality, and how their data would be used. The participants were assured that all responses would be anonymous and personal details removed from any reports or presentations. During the recruitment phase, efforts were made to include teachers from both subject areas. Although more EFL teachers (n = 103) than EMI Science teachers (n = 44), participated, this reflects the actual teacher distribution for EMI implementation in Vietnam. Apart from the comparative variable of teaching subjects, additional demographic details are as follows: The participants' ages ranged from 24 to 58 years, with a median age of 35 years. Their teaching experience ranged from less than a year to over 35 years, with a median of 10 years. In terms of gender, a somewhat higher proportion of female teachers (n = 83, 56%) was observed compared to their male counterparts (n = 64, 44%). This ratio aligns with the overall gender distribution within the teaching profession in Vietnam. The participants came from both urban and rural schools, offering a broad view of the education landscape in Vietnam. A majority of them (60%) were in possession of a Bachelor's degree, while 40% held a Master's degree.

Data collection instrument

The tool used in this study sought to measure how satisfied Vietnamese K-12 teachers regarding the impact of TAGs on their PD. To ensure cultural relevance and fit the context, the questionnaire just copied but adjusted from Guskey's (2000) five-level evaluation model. This meant adjusting the framework to better match the Vietnamese school setting and how TAGs were used there.

The questionnaire, encompassing 21 unique items, was carefully developed to assess teachers' satisfaction. This adaptation process involved careful consideration of the linguistic, cultural, and pedagogical aspects unique to Vietnam, ensuring that the questions were not only relevant but also resonated with the experiences of Vietnamese teachers. Participants were asked to designate their satisfaction on a 5-point Likert scale, with "1 - Strongly Unsatisfactory" signifying minimal satisfaction and "5 - Strongly Satisfactory" denoting maximal satisfaction. This approach reflects a deliberate effort to align Guskey's (2000) model with the local teaching and learning environment, thereby enhancing the validity and reliability of the data collected. By adapting, rather than directly adopting, the framework, the study ensures that the questionnaire is both sensitive to and reflective of the specific PD experiences and expectations of Vietnamese teachers involved in TAGs.

Several steps were taken to ensure the validity and reliability of the questionnaire. The primary focus in ensuring validity was on content validity, which refers to the extent to which the items of the questionnaire are representative of the constructs intended to be measured. It was designed after a thorough review of literature related to PD, TAGs, and Guskey's (2000) evaluative framework. Items within the questionnaire were carefully written to reflect the key ideas being studied, which helped support content validity. This involved ensuring that each question accurately reflected the specific aspects of PD satisfaction as conceptualized in the theoretical framework. Evidence for content validity came from the careful development of questions, which was based on a thorough literature review and grounded in established theoretical constructs.

Further, the questionnaire was reviewed by two education and PD experts to check that the items were appropriate and relevant. Their expertise and feedback provided critical evidence supporting the content validity of the instrument. They assessed each item for its clarity, relevance, and alignment with the constructs of PD satisfaction, providing recommendations for refinement where necessary. Through these comprehensive steps – including reviewing the literature, writing questions carefully, and getting expert input – the research confidently claims an acceptable level of content validity for the instrument. These steps ensured that the questionnaire was well-equipped to accurately measure the intended constructs, specifically the satisfaction levels of teachers participating in TAGs.

Before its formal distribution, the questionnaire was tested with a group of of 30 EFL teachers and 12 EMI Science teachers. It is crucial to clarify that these teachers were not part of the main study. Feedback regarding the clarity of instructions, the wording, and the overall layout of the questionnaire was sought from these individuals. This process helped improve the questionnaire and made it easier to understand. After making changes based on their suggestions, the questionnaire was finalized. This pilot group, which was different from the actual participants, helped confirm that the questionnaire worked as intended. However, some suggestions from the trial participants were reviewed but not used, as they were thought to affect the consistency and structure of the questionnaire. This separation between the trial group and the main participants helped protect the fairness and quality of the study. The trial group's role was solely to refine and validate the instrument, while the actual study participants provided the data central to the research findings.

To ensure the reliability of the instrument, an assessment of its internal consistency was carried out by calculating Cronbach's alpha coefficient ($\alpha = .82$). This statistical measure indicates that the items on the questionnaire consistently corresponded with each other, thereby strengthening the reliability of the data collected. This methodological rigor ensures the questionnaire items provide reliable measures of the constructs under exploration. These steps in refining and checking the questionnaire helped make sure it was appropriate and dependable for this study.

Ethical guidelines were followed during the design of the questionnaire and while collecting data. Informed consent was secured from participants, and clear steps were taken to protect their privacy and keep responses confidential. The study's objectives, the voluntary nature of

participation, and data protection measures were transparently explained to the participants. These steps helped strengthen the questionnaire's quality and made it more effective for understanding how satisfied teachers were with TAGs and how they viewed its impact on their PD.

Data analysis

The collected data, obtained from the questionnaire, were analyzed using descriptive statistics. The goal of this analysis was to summarize and understand the distribution and central tendencies of participants' responses. This encompassed the computation of central tendency measures (Mean), dispersion metrics (Standard Deviation), dispersion of the sample mean from the population mean (SEM), and frequency distributions for all items within the questionnaire. These measures conferred a generalized comprehension of the data, facilitating the interpretation of the multifaceted data set.

The distribution of the data underwent normality evaluation using the Shapiro-Wilk test, commonly used test for checking whether data are normally distributed. The results disclosed a W statistic of 0.98, indicative of an adequate fit to a normal distribution. The computed p-value was 0.15, exceeding the conventional 0.05 threshold, thereby indicating that the data adhered to a normal distribution. To uncover any substantial differences in the responses offered by EMI science teachers and EFL teachers, Independent Sample t-tests were implemented. This test helped determine whether there was a statistically significant difference between the means of the two groups. To establish the practical significance of these differences, effect size analyses were conducted using Cohen's d. A statistical significance threshold was predetermined at $p < .05$, aligned with Cohen's (2013) guidelines. Effect sizes were subsequently interpreted based on Cohen's (2013) benchmarks: a d-value ranging from 0.2 to 0.5 was perceived as indicating a small effect size, from 0.5 to 0.8 denoted a medium effect size, from 0.8 to 1.2 indicated a large effect size, and a d-value exceeding 1.2 suggested a very large effect size. This interpretation of effect sizes helped show how meaningful the differences were, regardless of the sample size. This combination of descriptive and inferential analysis, along with effect size, allowed for a clearer understanding of the data. This approach supported the study's conclusions and helped apply the findings to similar teaching contexts.

RESULTS

The findings from the Independent Sample T-test comparing the satisfaction levels of EMI Science and EFL participants in the TAGs program are shown in Table 1.

Table 1

Impact of specialization on K-12 teachers' satisfaction with TAGs

Measuring Aspects	Teaching Subjects	N	Mean	SD	SEM	p	d
Attractiveness of the Program	English	103	4.01	.86	.08	.03	.41
	Science	44	4.32	.64	.10		
Appropriateness of Training Course Duration	English	103	3.60	.80	.08	.02	.41
	Science	44	3.93	.73	.11		
Quality of Training Course Materials	English	103	3.82	.89	.09	.45	X
	Science	44	3.93	.76	.11		
Anticipated Future Utility of the Course	English	103	3.97	.80	.08	.38	X
	Science	44	4.09	.64	.10		
Expertise of Trainers	English	103	4.38	.77	.08	.95	X
	Science	44	4.39	.66	.10		
Level 1 - Participants' Reactions	**English**	**103**	**3.96**	**.68**	**.07**	**.13**	**X**
	Science	**44**	**4.13**	**.54**	**.08**		
Knowledge Appropriation	English	103	3.97	.87	.09	.79	X
	Science	44	3.93	.66	.10		
Skills Appropriation	English	103	3.91	.84	.08	.51	X
	Science	44	3.82	.66	.10		
Influence on Subsequent PD Initiatives	English	103	3.73	.92	.09	.48	X
	Science	44	3.84	.81	.12		
Level 2 - Participants' Learning	**English**	**103**	**3.87**	**.81**	**.08**	**.96**	**X**
	Science	**44**	**3.86**	**.67**	**.10**		
Institutional Support	English	103	4.02	.85	.08	.33	X
	Science	44	4.16	.65	.10		
Acknowledgement of Trainees	English	103	3.67	.98	.10	.84	X
	Science	44	3.64	.75	.11		
Resolution of Challenges	English	103	4.08	.78	.08	.81	X
	Science	44	4.05	.61	.09		
Suitability of Course Materials	English	103	3.78	.75	.07	.19	X
	Science	44	3.59	.87	.13		
Appreciation of Exemplary Participants	English	103	3.65	.86	.09	.96	X
	Science	44	3.66	.83	.13		
Level 3 - Organization Support and Change	**English**	**103**	**3.84**	**.65**	**.06**	**.85**	**X**
	Science	**44**	**3.82**	**.52**	**.08**		
Procurement of Novel and Useful Knowledge	English	103	3.90	.79	.08	.35	X
	Science	44	3.77	.74	.11		
Acquisition of Teaching Efficacy Enhancement Skills	English	103	3.91	.70	.07	.11	X
	Science	44	3.70	.73	.11		
Implications for Students' Learning Outcomes	English	103	3.90	.76	.08	.65	X
	Science	44	3.84	.71	.11		
Amelioration of Students' Performance	English	103	3.87	.74	.07	.67	X
	Science	44	3.82	.72	.11		
Level 4 - Participants' Use of New Knowledge and Skills	**English**	**103**	**3.90**	**.69**	**.07**	**.36**	**X**
	Science	**44**	**3.78**	**.66**	**.10**		
Favorable Influence on Students' Physical and Psychological Welfare	English	103	3.79	.84	.08	.83	X
	Science	44	3.82	.76	.11		
Amplification in Learners' Self-confidence	English	103	3.86	.77	.08	.86	X
	Science	44	3.84	.68	.10		
Augmentation in Class Attendance	English	103	3.68	.87	.09	.77	X
	Science	44	3.64	.75	.11		
Diminution in Student Attrition Rates	English	103	3.53	.85	.08	.59	X
	Science	44	3.61	.72	.11		
Level 5 - Student Learning Outcomes	**English**	**103**	**3.72**	**.74**	**.07**	**.93**	**X**
	Science	**44**	**3.73**	**.67**	**.10**		
General Evaluation	**English**	**103**	**3.86**	**.62**	**.06**	**.88**	**X**
	Science	**44**	**3.88**	**.53**	**.08**		

The results show that participants overall evaluated TAGs positively (M_EMI = 3.88; M_EFL = 3.86). There was no meaningful difference in satisfaction levels between the two groups participating in the TAGs program (p = .88). When looking at specific areas, no significant statistical variation was observed between the perceived levels of satisfaction among teachers specializing in Science subjects compared to those specializing in English, as indicated by p-values exceeding .05. Several factors might explain this overall positive assessment. Firstly, the core characteristics of TAGs - self-directed and collaborative learning experiences - align well with the intrinsic motivations and preferences of adult learners as posited by the ALT (Zepeda et al., 2014). These features allow teachers to have agency in their professional learning process and enable them to draw upon and share their professional experiences, contributing to their satisfaction with the TAGs. Secondly, the CoP Theory explains how the collaborative nature of TAGs fosters a sense of community among the teachers (Mak & Pun, 2015). The shared goals and regular interaction within the TAGs might have created a supportive environment that fostered knowledge exchange and collaborative problem-solving, thereby enhancing teachers' satisfaction with their participation in the TAGs. Lastly, the similar positive evaluations from both the EMI Science and EFL teacher groups suggest that TAGs worked well across different subject areas. This could indicate that the methods and practices used in TAGs were flexible and useful in many teaching situations, further contributing to the teachers' satisfaction (Shulman, 1987).

When looking more closely at each part of the evaluation, a clear difference appeared regarding the teachers' perceptions of the program's engaging nature and the suitability of the training course length, as signified by the corresponding *p*-values of .03 and .02 respectively. When comparing EMI Science teachers to those engaged in EFL teaching, a higher level of satisfaction was reported among the Science EMI teachers pertaining to the program's captivating quality (M_EMI = 4.32; M_EFL = 4.01) and the defensibility of the training course length (M_EMI = 3.93; M_EFL = 3.60). The effect size, calculated with using Cohen's d, for both areas was small (d = .41), suggesting that the difference in satisfaction between the two groups was not mainly due to sample size. In short, the significant differences seen in the t-test results may be linked to the teachers' subject areas. The contrast in perceptions might be impacted by the teachers' anticipations and preferences pertaining to the program's goals and resultant outcomes.

EMI Science teachers, who might be more motivated to improve their English to teach their subject clearly and effectively, are more likely to find the TAGs program valuable and engaging (Nguyen, 2020). Additionally, the program's content and activities could better meet their professional needs, leading to higher satisfaction compared to EFL teachers who might have different expectations and goals for their PD (Vu & Burn, 2014).

For EFL teachers, the TAGs program might feel similar to other group-based PD programs, where they had the opportunity to exchange pedagogical experiences with peers. Nevertheless, the TAGs program endowed EMI Science teachers with additional benefits, specifically the opportunity to collaborate with native English speakers who facilitated the program. In the context where Vietnamese EMI Science teachers were facing many challenges (Nguyen, 2020), the inclusion of native English speakers as facilitators in PD initiatives such as TAGs significantly enriched the pedagogical experience for these teachers. Their involvement not only provided

a real English-speaking environment, but also fostered cultural comprehension, thereby broadening the global perspectives of the participating teachers (Truong & Murray, 2020). Facilitators who are native English speakers could share real-life examples and explain cultural language use, which are often hard to teach through regular PD formats (Prabjandee, 2020). The role of these facilitators went beyond language instruction - they also acted as mentors and guides. They fostered a supportive, stimulating, and collaborative environment, encouraging teachers to reflect, ask questions, and try new teaching ideas (Mann & Walsh, 2017).

CONCLUSION

This study examined the satisfaction levels of Vietnamese K-12 teachers participating in TAGs and explored the impact of teachers' subject specialization on their satisfaction. The results indicated an overall positive evaluation of TAGs by the participants. The theoretical framework, encompassing the ALT, CoP Theory, and PCK Theory, provided a comprehensive understanding of the factors influencing teachers' satisfaction and PD within the context of TAGs.

The positive assessment of TAGs can be attributed to their alignment with the intrinsic motivations and preferences of adult learners, as emphasized by the ALT. The self-directed and collaborative nature of TAGs empowers teachers to engage in their own professional learning and share their experiences, contributing to their satisfaction. Additionally, the CoP Theory highlights the collaborative and knowledge-sharing aspects of TAGs, fostering a sense of community among teachers and promoting satisfaction and professional growth. The usefulness and value of TAGs were found to go beyond particular subject areas, indicating their broad applicability and benefits to various teaching contexts.

However, when examining specific aspects of the evaluation framework, a clear difference was found in the teachers' perceptions of the engaging quality of the program and the length of the training course duration. EMI Science teachers exhibited a higher level of satisfaction compared to their counterparts in EFL teaching. This difference may be due to how well the program content matched their subject area. EMI Science teachers found the TAGs program more engaging and useful for their classroom needs. On the other hand, EFL teachers, whose focus is primarily on language instruction, may not perceive the program as directly aligned with their needs, resulting in slightly lower satisfaction scores.

IMPLICATIONS

Implications for teachers

Given the evolving ELT and EMI landscape in Vietnam, where English is not only a language to be taught but also a medium for teaching various subjects, it becomes even more crucial for teachers to engage in PD initiatives like TAGs. Teachers should actively engage in collaborative PD initiatives, such as TAGs, to enhance their pedagogical competence and foster their professional growth. By participating in TAGs, teachers can benefit from the collective expertise

and knowledge exchange within a community of practitioners, thereby enriching their instructional practices. It is crucial for teachers to recognize the value of subject-specific PD opportunities that align with their subject specialization and instructional context. This alignment can contribute to a higher level of satisfaction and perceived relevance of the PD experience. Additionally, teachers should reflect on their expectations and preferences when engaging in PD activities, as these factors can influence their satisfaction levels and perceived benefits from the initiatives.

Implications for policymakers

In the context of Vietnam's ELT and EMI policies, policymakers should consider the unique challenges that teachers face in adapting to these educational models. Policymakers in the education sector should prioritize the implementation of cooperative approaches to PD, such as TAGs, to foster a supportive and collaborative environment among teachers. Recognizing the importance of collaborative learning, policymakers should allocate resources and provide support for subject-specific PD initiatives, taking into account the diverse needs of teachers across different subject areas. Besides, by supporting and promoting collaborative PD initiatives, policymakers can contribute to the continuous improvement of teachers' instructional practices and the overall quality of education.

Implications for school administrators

School administrators in Vietnam, where the application of ELT and EMI is becoming more widespread, have a critical role in integrating these approaches into the existing educational framework. In educational institutions where both EFL and EMI Science teachers participated in TAGs, there is a valuable chance to use collaborative PD to improve teaching. These teachers, although teaching different subjects, share the common thread of English language instruction, which creates opportunities for collaboration across subjects. In such contexts, EFL teachers, with their expertise in teaching English, can offer useful ideas about language teaching, assessment, and ways to keep students engaged. Conversely, EMI Science teachers, with their experience of integrating subject-specific content with English language instruction, can share strategies for making complex ideas easier to understand and managing bilingual classrooms effectively. The collaboration between the two groups can lead to meaningful sharing of ideas and teaching methods, helping both sides improve their practice. School administrators should, therefore, support these kinds of partnerships and use TAGs as a space for cross-subject professional development.

Implications for teacher education institutions

Institutions responsible for teacher education in Vietnam need to make sure their programs reflect the real needs of ELT and EMI, preparing future educators for these specific teaching environments. Teacher education institutions can also support this by including cooperative learning in their programs, helping prepare future teachers to take part in collaborative PD initiatives like TAGs. By encouraging teamwork and sharing of teaching ideas, these institutions can significantly contribute to enhancing teaching effectiveness and promoting continuous professional growth among teachers.

LIMITATIONS AND RECOMMENDATIONS

This study has some limitations that should be acknowledged. Firstly, the study sample was limited to Vietnamese teachers participating in TAGs, which may limit the generalizability of the findings to other educational contexts. Secondly, the study relied on self-reported measures of satisfaction, which may be subject to social desirability bias or subjective interpretations. Lastly, the study focused on the perceptions and satisfaction levels of teachers, but did not examine the actual changes in instructional practices or student outcomes resulting from their participation in TAGs.

Based on the findings and limitations of this study, several recommendations for further research can be made. Firstly, it would be valuable to conduct qualitative research, such as interviews or focus groups, to gain a deeper understanding of the specific factors that contribute to teachers' satisfaction with TAGs and their perceived impact on PD. Qualitative research can provide insights into teachers' experiences, motivations, and challenges in participating in collaborative PD initiatives. Additionally, future studies could explore the role of different variables, such as teachers' years of experience, educational backgrounds, or school contexts, in influencing their satisfaction and perceived benefits from TAGs. Furthermore, longitudinal studies could be conducted to investigate the long-term effects of TAGs on teachers' instructional practices, pedagogical knowledge, and student outcomes. By examining the sustained impact of TAGs over an extended period, researchers can assess the effectiveness and sustainability of these collaborative PD initiatives. Additionally, comparative studies could be conducted to explore the differences in satisfaction levels and perceived benefits among teachers of various subjects, such as science, mathematics, or humanities. Understanding how different subject areas and instructional contexts influence teachers' experiences and outcomes in TAGs can inform the design and implementation of subject-specific PD programs.

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