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# Moderating Effect of Technological Content Knowledge on Teachers' Attitude towards Digital Technology and Classroom Supervision Competence

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**Abstract:- The study evaluated the moderating effect of technological content knowledge on the interaction between attitude towards digital technology and teachers' classroom supervision competence. In this study, the researcher selected the 200 public elementary school teachers in Marilog District, Davao City as the respondents of the study. Stratified random sampling technique was utilized in the selection of the respondents. Non-experimental quantitative research design using descriptive-correlational method was employed. The data collected were subjected on the following statistical tools: Mean, Partial Correlation, and Heirarchical Regression Analysis. Descriptive analysis showed that attitude towards digital technology, teachers' classroom supervision competence, and technological content knowledge were rated as extensive. Further, partial correlation analysis demonstrated that there is significant relationship between attitude towards digital technology and teachers' classroom supervision competence when moderated by technological content knowledge. Evidently, hierarchical regression analysis proved that technological content knowledge significantly moderates the interaction between attitude towards digital technology and teachers' classroom supervision competence. In other words, technological content knowledge is a significant moderator on the attitude towards digital technology and teachers' classroom supervision competence in Marilog District, Davao City. The study, therefore, was conducted for further utilization of findings through publication in reputable research journal.**

***Keywords:-*** *Educational Management, Attitude towards Digital Technology, Teachers' Classroom Supervision Competence, Technological Content Knowledge.*

## I. INTRODUCTION

In the rapidly evolving landscape of education, the integration of digital technology has become progressively more vital. The use of digital tools in classrooms not only improves the learning experience but also demands a revolution in teaching practices and supervision strategies. Teachers, as the leading facilitators of this change, face the challenge of adjusting to these new tools while providing effective classroom management. The concept of Technological Pedagogical Content Knowledge (TPACK) has emerged as a critical framework to understand how teachers incorporate technology with pedagogy and subject matter knowledge.

Teachers' attitudes towards digital technology significantly influence their willingness to adopt and effectively use such tools in the classroom. Positive attitudes often correlate with higher levels of technological integration, whereas negative attitudes can act as stumbling block. However, mere positive disposition towards technology is insufficient; teachers must possess adequate expertise and proficiencies to utilize these tools efficiently. This is where Technological Content Knowledge (TCK) becomes significant. TCK refers to teachers' understanding of how technology can be used to enhance the learning of specific content. It includes not only familiarity with digital tools but also the ability to apply these tools to facilitate and improve subject-specific learning outcomes.

The intent of this study was to evaluate the moderating effect of technological content knowledge on attitude towards digital technology and classroom supervision competence of the teachers. Since it is known that the quality of education depends primarily on the way teachers managed the behavior of the students, more than on the abundance of available resources, and that the capacity of teachers to maintain orderliness in the classroom influenced the academic success of the students. To the knowledge of the researcher, most of the studies on the classroom supervision competence of teachers are conducted in a foreign setting and only examined the direct influence. Thus, it is on this context that the researcher felt the need to fill-in the research gap of conducting a study in the Philippine context, particularly in Marilog District, Davao City using a quantitative research design. Specifically, the researcher used of hierarchical regression analysis to understand the teachers' classroom instructional competence as determined by the attitude towards digital technology and moderated by technological content knowledge which is found to be scarce.

Attitude towards digital technology as defined by Štemberger and Konrad (2021) is one's positive or negative evaluation towards the introduction of new kinds of technology in any environment. Also, Meel (2016) described attitude toward digital technology as the person's general evaluation or feeling of favor or antipathy towards computer technologies and specific computer related activities. As attitudes are learnt, Kutluca (2014) viewed that

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they are mouldable that is they change with experience of the stimulus objects and with social rules or institutions, and attitude would affect individual in everything they do and in fact reflects what they are, and hence a determining factor of individual's behavior towards computer technology.

Classroom supervision competence as defined by Temli-Durmus (2016) is an intricate aspect of teaching and effectively managed classrooms which is essential for the construction of an effective learning environment. Likewise, Nasey (2012) described management practices as the action taken by the teacher or instructor to ensure that the assigned tasks have been performed by the students. It has to do with rules, routines, structure-managing instruction, organizing learning materials and activities.

In the educational processes, classroom supervision competence is considered as a complex exercise. This is because it demands talent, skills, energy, and ability from the teacher to manage classroom because it directly deals with the behaviors of learners (Zouzou, 2015). Effective instructional supervision skill is about creating inviting and appealing environments for student learning and also tools that the teachers can use to help create such an environment, ranging from activities to improve teacher-student relationships to rules to regulate student behavior (Korpershoek et al., 2014).

From the perspective of bonding to schools, describe a set of emotional supports and organizational techniques that are equally important to learners as teachers' instructional methods and posited that by providing emotional support and a predictable, consistent, and safe environment, students become more self-reliant, motivated to learn, and willing to take risks by modeling strong organizational and management structures, teachers can help build students' own ability to self-regulate (Pianta & Hamre, 2009).

In addition, teacher leadership behavior and effective management practices played a key role in leading the progress of not only to the class but also to the school, therefore it contributed directly to improving students' achievement. Based on the literature review, teacher leadership could bring a positive impact on classroom management (Tang & See, 2009). Teacher leadership could bring a positive impact on classroom management. Previous studies like Siti-Aida (2011) and Tan (2011) have indicated that the practice of teacher leadership would enable to improve management practices of teachers.

Reviews of literature shows positive association between online technology attitude and individual teaching efficiency. On a study by Granito and Chernobilsky (2012) developing individuals' positive attitude towards online technology create enjoyment which allow the teachers to innovate their motivated strategies utilized in the teaching-learning processes, thus, helping them respond positively to the challenging tasks given by the career. On the study, result pointed out that as the attitude towards online technology of the individuals developed, they become digital natives. Hence, allowing these digital natives to respond well to technology-infused activities because of their familiarity with online technology. Online technologies and teaching efficiency have positive effects on student motivation.

## II. METHOD

The researcher utilized quantitative descriptive-correlational technique of research to gather data ideas, facts and information related to the attitude towards digital technology, classroom supervision competence, and technological content knowledge of teachers. The findings from quantitative research aim to provide a deeper understanding of patterns, relationships, and trends within the data.

Respondents of the study were the elementary school teachers in Marilog District, Davao City. In this study, the 200 respondents were selected through stratified random sampling technique. The study employed the adopted and modified survey questionnaires which was contextualized to fit the context of the respondents of this study.

The first part of the instrument concerned about the attitude towards digital technology of the teachers. This questionnaire was composed of statements that were divided among the indicators: technical, pedagogical, ethical, and attitudinal. The Cronbach's alpha value of 0.951, described as excellent and interpreted as very reliable.

The second part of the instrument was the classroom supervision competence. The questionnaires were composed of statements which were divided among the indicators namely management practices, behavior management, and instructional management. The Cronbach alpha value for the new scale is 0.956 described as excellent and interpreted as high reliability and consistency. In the manner of answering the questionnaire, the items the respondents made use the 5-Likert scale.

The third part of the instrument concerns about the technological content knowledge of the teachers in Marilog District, Davao City adapted from the study of Hosseini and Kamal (2012). The Cronbach coefficient value for this instrument is 0.953 described as excellent and interpreted as high reliability and consistency. In the manner of answering the questionnaire, the items were modified so that it may suit the context of this study.

In conclusion, the researcher utilized statistical tools in processing the gathered data. Mean was used in characterizing the teacher's attitude towards digital technology, classroom supervision competence, and technological content knowledge. Partial Correlation was used in this study to assess the significant relationship between attitude towards digital technology and classroom supervision competence of teachers when moderated by technological content knowledge. And the Hierarchical Regression Analysis was applied to evaluate the moderating effect of technological content knowledge on the interaction

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between attitude towards digital technology and classroom supervision competence of teachers.

## III. RESULTS AND DISCUSSIONS

This presents the extents of attitude towards digital technology, classroom supervision competence, and technological content knowledge of teachers in Marilog District, Davao City; the significant relationship between attitude towards digital technology and classroom supervision competence of teachers in Marilog District, Davao City when moderated by technological content knowledge; and the moderating effect of technological content knowledge on the interaction between attitude towards digital technology and classroom supervision competence of teachers.

➢ *Teachers' Attitude towards Digital Technology*

- *Technical*

In terms of technical component, it shows an extensive category mean rating of 3.78 which means that this attitude towards digital technology of teachers is oftentimes observed by teachers in Marilog District in Davao City. The mean rating of the different items ranges from 3.18 to 4.08. The item *knowing how to solve their own technical problems* reflects a mean rating of 3.18, described as moderately extensive and interpreted as item is sometimes observed. Meanwhile, the item, *using technology tools to process data and report results* shows a rating of 4.08, described extensive, interpreted as oftentimes observed by the respondents.

The result means that teachers oftentimes effectively integrate technology into their teaching methods. They can leverage various digital tools to enhance the learning experience, engage students, and make complex concepts easier to grasp. This supports Mahajan's (2016) view that when teachers are adept at using digital technology, they can create interactive and multimedia-rich learning experiences. This increased engagement can positively impact students' motivation and interest in the subject matter. This result also agrees with the view of Vaseghi et al. (2012) that extensive teachers' knowledge and skills on digital technology is crucial in fostering an innovative and effective learning environment, preparing students for the digital age, and ensuring that education keeps pace with the rapidly evolving technological landscape.

Table 1 Teachers' Attitude towards Digital Technology in Terms of Technical

| Statement | Mean | Descriptive Rating |
|---|---|---|
| Knowing how to solve their own technical problems. | 3.18 | Moderately Extensive |
| Using technology tools to process data and report results. | 4.08 | Extensive |
| Feeling apprehensive about using a computer. | 3.91 | Extensive |
| Using technology in the development of strategies for solving problems in the real world. | 3.98 | Extensive |
| Being confident that I can handle computer without damaging it. | 3.76 | Extensive |
| **Mean** | **3.78** | **Extensive** |

- *Pedagogical*

Specifically, examining the dimension on pedagogical reveals that its category mean is 3.51 described as extensive which means that this dimension of teachers' attitude towards digital technology in terms of pedagogical is oftentimes observed among the respondents. The table further reveals that the mean rating of the items ranges from 2.62 to 4.17. It is noteworthy that item, *choosing technology that can enhance the teaching approaches for a lesson* has a mean rating of 2.62, described as moderately extensive and interpreted as this descriptor on this indicator is sometimes observed by respondents. It is worth to note that the item *using digital technology enhance the presentation of my work to a degree which justifies the extra work* has a mean rating of 4.17, described as extensive and interpreted as oftentimes observed by the teachers in Marilog District, Davao City.

Table 2 Attitude towards Digital Technology of Teachers in Terms of Pedagogical

| Statement | Mean | Descriptive Rating |
|---|---|---|
| Using digital technology help me improve my teaching efficiency. | 3.01 | Moderately Extensive |
| Working with digital technology help me do my work conveniently. | 3.98 | Extensive |
| Using digital technology allows me to do more interesting and imaginative work. | 3.75 | Extensive |
| Choosing technology that can enhance the teaching approaches for a lesson | 2.62 | Moderately Extensive |
| Using digital technology enhance the presentation of my work to a degree which justifies the extra work. | 4.17 | Extensive |
| **Mean** | **3.51** | **Extensive** |

The result implies that the ability of teachers to navigate the digital age and leverage technology in meaningful ways within the teaching-learning process is oftentimes observed. The result supports the assertion of Cavanagh and Koehler (2013) that teachers with high technical and pedagogical skills can seamlessly integrate technology into their teaching practices. They can choose appropriate digital tools and resources that align with their educational goals and enhance the learning experience. This also agreed with the idea of Koehler and Mishra (2009), that teachers with strong technical and pedagogical skills can adapt instruction to meet individual student needs.

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Technology allows for differentiated learning experiences, catering to varying learning styles and paces.

- *Ethical*

The table shows that the dimension, ethical, was assessed by the teacher as extensive with a category mean of 3.40, interpreted as oftentimes observed by teachers in Marilog District, Davao City. The mean rating of the different items ranges from 2.78 to 4.20. On one hand, the item *Recognizing copyrighted information* has a mean rating of 2.78, described as moderately extensive, interpreted as sometimes observed. On the other hand, the item *Being honest when engaging in digital technology* reflects a mean of 4.20 described as very extensive and interpreted as always observed by the respondents.

This finding means that educators are knowledgeable about the ethical considerations and responsible use of technology and the internet. This result supports the finding of Abdullah et al. (2015) that teachers who are well-informed about cyber-ethics can effectively guide students in using technology responsibly and ethically. They can teach students how to navigate digital spaces safely, avoid engaging in harmful online behaviors, and understand the consequences of their actions in the digital world. In addition, the result supports the findings of Oye and Iahad (2013) that teachers with a strong understanding of cyber-ethics can instill the principles of good digital citizenship in their students. This involves teaching students to respect others' online identities, engage in constructive online discussions, and protect their own and others' digital rights.

Table 3 Attitude towards Digital Technology of Teachers in Terms of Ethical

| Statement | Mean | Descriptive Rating |
|---|---|---|
| Avoiding using foul language while using digital technology. | 3.72 | Extensive |
| Recognizing copyrighted information. | 2.78 | Moderately Extensive |
| Being honest when engaging in digital technology. | 4.20 | Very Extensive |
| Safeguarding personal and private data. | 3.34 | Moderately Extensive |
| Being polite and respectful in communicating while using digital technology. | 2.98 | Moderately Extensive |
| **Mean** | **3.40** | **Extensive** |

- *Attitudinal*

The table shows that the dimension, attitudinal, was assessed by the teachers as extensive with a category mean of 3.61, interpreted as oftentimes observed by the teachers in Marilog District, Davao City. The mean rating of the different items ranges from 2.78 to 4.09. Further, the item *Grabbing opportunity that I can encounter computers at school* has a mean rating of 2.78, described as moderately extensive and interpreted as sometimes observed by the teachers. Furthermore, the item *Evaluating and selecting new information approaches and technological innovations based on their appropriateness on specific tasks in particular content or topic* attained a mean score of 4.09 described as extensive and interpreted as item on this domain is oftentimes observed by the respondents in Marilog District, Davao City.

This finding means that the willingness, receptiveness, and positive disposition of educators towards incorporating and utilizing innovative digital tools and technologies in their classrooms is oftentimes observed. This supports Saricoban's (2013) idea that an open attitude towards technology enables educators to adopt adaptive learning platforms, digital assessments, and personalized learning pathways to meet students' unique requirements. More so, the result agrees with Sánchez-Prieto's et al. (2017) assertion that teachers who are open to new technologies can explore various digital tools and applications to reinforce concepts, provide timely feedback, and measure student progress more efficiently. In addition, the result agrees with Wang and Liu's (2014) idea that educators with an open attitude can use digital communication tools, online discussion forums, and collaborative platforms to encourage peer-to-peer learning and interaction.

Table 4 Attitude towards Digital Technology of the Teachers in Terms of Attitudinal

| Statement | Mean | Descriptive Rating |
|---|---|---|
| Being open in using digital technology in teaching. | 3.53 | Extensive |
| Grabbing opportunity that I can come in contact with computers at school. | 2.78 | Extensive |
| Using computers at school when it is necessary for teaching and completing tasks. | 3.93 | Extensive |
| Using technology for more collaboration and communication with students. | 3.73 | Moderately Extensive |
| Evaluating and selecting new information approaches and technological innovations based on their appropriateness on specific tasks in particular content or topic. | 4.09 | Extensive |
| **Mean** | **3.61** | **Extensive** |

Lastly, Table 5 shows the summary of the extent of teachers' attitudes towards digital technology in Marilog District, Davao City. As shown in the table, the overall mean of the teachers' attitude towards digital technology is 3.58 which is described as extensive. It means that the teachers' attitude toward digital technology was oftentimes observed. Adding more, the table also shows that teachers' attitude towards digital technology in terms of technical acquired the highest mean score of 3.78 described as extensive and interpreted as oftentimes observed, while teachers' attitude towards digital technology in terms of ethical got the lowest mean score of 3.40 described as extensive and interpreted as oftentimes observed by the teachers in Marilog District, Davao City.

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Table 5 Summary on Teachers' Attitude towards Digital Technology in Marilog District, Davao City

| Indicators | Mean | Descriptive Equivalent |
|---|---|---|
| Technical | 3.78 | Extensive |
| Pedagogical | 3.51 | Extensive |
| Ethical | 3.40 | Extensive |
| Attitudinal | 3.61 | Extensive |
| **Overall** | **3.58** | **Extensive** |

The result implies that teachers' positive beliefs, perceptions, and willingness to integrate digital tools and technology into their teaching practices is oftentimes observed by the teachers. The result corroborates Kutluca's (2014) idea that teachers with a positive attitude towards digital technology are more likely to incorporate various technology tools and applications into their lessons. This integration can lead to more interactive and engaging learning experiences for students. Moreover, the result agrees with the idea of Shaukenova (2016) that teachers who embrace digital technology are more likely to engage in continuous professional development opportunities. They may actively seek out training and workshops to stay updated on the latest technological advancements and best practices in educational technology. With a positive attitude towards digital technology, teachers are more likely to adopt blended learning approaches that combine both traditional classroom instruction and online learning experiences. This flexibility can cater to different learning preferences and schedules.

➢ *Teachers' Classroom Supervision Competence*

- *Instructional Management*

This dimension has a category mean of 3.50 described as extensive and interpreted as teachers' classroom supervision competence in terms of instructional management is oftentimes manifested by the teachers. Adding on, looking at the mean ratings of the different items, they range from 2.85 to 3.98. The item, *preparing good, structured learning activities* reflects a mean rating of 2.85, described as moderately extensive, and interpreted as sometimes manifested by the respondents. The item *encouraging learners to engage in learning tasks* has a mean rating of 3.98, described as extensive and interpreted as item oftentimes manifested by the teachers.

This means that the set of strategies, actions, and decisions that educators use to effectively organize and facilitate the teaching and learning process in the classroom is oftentimes manifested by the teachers. This finding is congruent to the view of Nevid (2011) that teachers' instructional management involves fostering effective communication with students. Clear instructions, active listening, and open dialogue create a supportive and inclusive learning environment where students feel comfortable participating and expressing their ideas. Adding more, the result corroborates with the view of Zouzou (2015) that effective instructional management can positively impact student learning outcomes by optimizing instructional time and creating a supportive learning environment that fosters engagement and active participation.

Table 6 Teachers' Classroom Supervision Competence in terms of Instructional Management

| Statement | Mean | Descriptive Rating |
|---|---|---|
| Encouraging learners to engage in learning tasks. | 3.98 | Extensive |
| Preparing good, structured learning activities. | 2.85 | Extensive |
| Encouraging learners to be active during learning –teaching process. | 3.42 | Extensive |
| Being good at time management. | 3.39 | Moderately Extensive |
| Knowing effective strategies to attract students attention. | 3.88 | Extensive |
| **Mean** | **3.50** | **Extensive** |

- *Management Practices*

This dimension has a category mean of 3.31 described as moderately extensive and interpreted by the teachers of Marilog District in Davao City is sometimes manifested. Adding on, looking at the mean ratings of the different items, they range from 2.61 to 3.92. The item, *Persuading learners to obey the classroom rules* reflects a mean rating of 2.61, described as moderately extensive and interpreted as item sometimes manifested by the teachers. The item *recognizing what students demand* obtained the mean of 3.92 described as extensive and interpreted as item oftentimes observe among teachers in Marilog District, Davao City.

The results suggest that strategies, methods, and actions that educators use to effectively organize, direct, and facilitate the teaching-learning process in the classroom is sometimes manifested. This finding supports Orodho and Waweru's (2013) idea that effective management practices contribute to a positive and supportive learning environment where students feel motivated, engaged, and respected. Adding more, the finding agrees with Lumpkin's (2013) view that effective management practices help maintain smooth classroom dynamics and foster positive relationships between students and teachers. By implementing effective classroom management techniques, thoughtful instructional design, and student engagement strategies, teachers can create an environment that promotes learning, growth, and success for all students.

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Table 7 Teachers' Classroom Supervision Competence in terms of Management Practices

| Statement | Mean | Descriptive Rating |
|---|---|---|
| Encouraging learners to determine classroom rules. | 3.81 | Extensive |
| Persuading learners to obey the classroom rules. | 2.61 | Moderately Extensive |
| Having required skills about Classroom Management. | 2.62 | Moderately Extensive |
| Providing effective communication skills in classroom. | 3.60 | Extensive |
| Recognizing what students demand. | 3.92 | Extensive |
| **Mean** | **3.31** | **Moderately Extensive** |

- *Behavior Management*

Specifically, examining the domain on behavior management results on Table 8 reveal that its category mean is 3.69 described as extensive which means that this particular domain on classroom supervision competence is oftentimes manifested by the teachers of Marilog District, Davao City. The table further reveals that the mean rating of the items ranges from 3.06 to 3.98. It is noteworthy that item, *using preventive strategies* has a mean rating of 3.06, described as moderately extensive and interpreted as item sometimes manifested while item *dealing with learners' misbehaviors positively* has a mean rating of 3.98, described as extensive and interpreted as item oftentimes observed by the teachers.

This finding means the ability of the teacher to deal with students' misbehavior during teaching-learning processes is oftentimes manifested by the teachers. This supports the view of More and Miller (2015) that effective behavior management creates a positive and safe learning environment where students feel comfortable and motivated to participate actively in the learning process. A positive classroom atmosphere enhances engagement and learning outcomes. In addition, the result is in agreement with the idea of Blazar (2016) that effective behavior management can strengthen the teacher-student relationship. When teachers address behavioral issues in a respectful and caring manner, students feel supported and valued.

Table 8 Teachers' Classroom Supervision Competence in terms of Behavior Management

| Statement | Mean | Descriptive Rating |
|---|---|---|
| Coping up with disruptive behaviors. | 3.69 | Extensive |
| Using preventive strategies. | 3.06 | Moderately Extensive |
| Dealing with learners misbehaviors positively. | 3.98 | Extensive |
| Influencing the behavior of learners to achieve desired outcomes. | 3.95 | Extensive |
| Establishing clear expectations | 3.77 | Extensive |
| **Mean** | **3.69** | **Extensive** |

Lastly, Table 9 shows the summary of the extent of teachers' classroom supervision competence in Marilog District, Davao City. The overall mean of teachers' classroom supervision competence is 3.50 described as extensive. Adding more, the table shows that teachers' classroom supervision competence in terms of behavioral management acquired the highest mean score of 3.69 described as extensive and interpreted as oftentimes manifested, while teachers' classroom supervision competence in terms of behavioral management got the lowest mean score of 3.31 described as moderately extensive and interpreted as sometimes manifested among teachers in Marilog District, Davao City.

This means that teachers' ability to effectively observe, monitor, and assess student behavior and learning activities in the classroom is oftentimes manifested. The result supports the idea of Nasey (2012) that competent classroom supervision allows teachers to maintain a well-organized and disciplined learning environment. By being attentive to students' behavior and engagement, teachers can promptly address any disruptions and ensure that instructional time is maximized. Adding more, the result also corroborates with Zouzou's (2015) idea that competent classroom supervision fosters higher levels of student engagement. Teachers can observe students' reactions to different activities and adapt their teaching methods to enhance student interest and participation.

Table 9 Summary on Teachers' Classroom Supervision Competence in Marilog District, Davao City

| Indicators | Mean | Descriptive Equivalent |
|---|---|---|
| Instructional Management | 3.50 | Extensive |
| Management Practices | 3.31 | Moderately Extensive |
| Behavior Management | 3.69 | Extensive |
| **Overall** | **3.50** | **Extensive** |

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➢ *Teachers' Technological Content Knowledge*

Teachers' technology content knowledge acquired a mean score of 3.69 described as extensive and interpreted by the teachers of Marilog District in Davao City is oftentimes evident. Looking at the mean ratings of the different items, they range from 3.33 to 4.04. The item, *Finding and evaluating the resources that he/she needs for the subject matter he/she is handling* reflects a mean rating of 3.33, described as moderately extensive and interpreted as item sometimes manifested by the teachers. The item, *using technology for presenting the subject matter he/she is teaching* obtained the mean of 4.04 described as extensive and interpreted as item oftentimes observe among teachers in Marilog District, Davao City.

Table 10 Teachers' Technological Content Knowledge

| Statement | Mean | Descriptive Rating |
|---|---|---|
| Knowing about technologies that he/she can use for understanding the subject matter he/she is teaching. | 4.01 | Extensive |
| Knowing how to use specific software and Web sites about the subject matter he/she is teaching in elementary level. | 3.45 | Extensive |
| Finding and evaluating the resources that he/she need for the subject matter he/she is handling. | 3.33 | Moderately Extensive |
| Using technology for presenting the subject matter he/she is teaching. | 4.04 | Extensive |
| Using technology tools and resources for managing and communicating information of the subject matter he/she is teaching. | 3.62 | Extensive |
| **Mean** | **3.69** | **Extensive** |

This implies that the expertise and understanding that educators possess in effectively integrating technology into their subject-specific content is oftentimes evident. This finding supports Aboshady's et al. (2015) idea that integrating technology in the classroom can facilitate active learning strategies, such as collaborative projects, multimedia presentations, and interactive simulations, promoting deeper understanding and knowledge retention. Adding more, the finding agrees with Renny's et al. (2012) proposition that encouraging teachers to develop high levels of technological content knowledge requires ongoing professional development and training. Institutions should invest in workshops and courses to support educators in enhancing their technological competencies.

➢ *Relationship between Attitude towards Digital Technology and Teachers' Classroom Supervision Competence with Technological Content Knowledge as Moderator*

The results on the analysis on the relationship between attitude towards digital technology and classroom supervision competence of teachers in Marilog District, Davao City when moderated by technological content knowledge are presented. Bivariate correlation analysis using Pearson product moment correlation was utilized to determine the relationship between the variables mentioned.

Table 11 shows that attitude towards digital technology has a significant positive relationship with the teachers' classroom supervision competence in Marilog District, Davao City when moderated by technological content knowledge with a p-value of .000 that is less than .05 level of significance (two-tailed) ($r = 0.788$, $p < 0.05$). It means that as the extent of the attitude towards digital technology changes, classroom supervision competence of teachers also changes significantly when moderated by technological content knowledge. Adding more, the result in the table also shows that attitude towards digital technology in terms of technical, pedagogical, ethical, and attitudinal have significant positive relationship with the classroom supervision competence of teachers when moderated by technological content knowledge with a p-value of .000 that is less than .05 level of significance (two-tailed) ($r = 0.351$, $p < 0.05$), ($r = 0.659$, $p < 0.05$), ($r = 0.246$, $p < 0.05$), and ($r = 0.812$, $p < 0.05$), respectively.

The result implies that when teachers possess high technological content knowledge, it can enhance their ability to effectively supervise classrooms where digital technology is being utilized. They can more adeptly observe and guide students' use of technology, ensuring that it aligns with the learning objectives and promotes a positive and productive learning environment. The result corroborates with Piccinini and Scarantino's (2016) proposition that teachers with a high level of technological content knowledge are better equipped to adapt to new technologies and innovations. As they embrace and integrate these new tools into their classrooms, their attitude towards digital technology becomes a driving force for their professional development and growth. In addition, the result is congruent to Saeed's (2015) assertion that teachers who possess higher technological content knowledge are more likely to provide equal learning opportunities for all students, regardless of their socio-economic background or access to technology outside the classroom.

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Table 11 Relationship between Attitude towards Digital Technology and Classroom Supervision Competence of Teachers with Technological Content Knowledge as Moderator

| **Variables** | Classroom Supervision Competence | | | |
|---|---|---|---|---|
| | Technological Content Knowledge (Moderator) | | | |
| | **r-value** | **p-value** | **Interpretation** | **Decision** |
| Technical | 0.351* | 0.000 | Significant | Reject $H_0$ |
| Pedagogical | 0.659* | 0.000 | Significant | Reject $H_0$ |
| Ethical | 0.246* | 0.000 | Significant | Reject $H_0$ |
| Attitudinal | 0.812* | 0.000 | Significant | Reject $H_0$ |
| **Overall Attitude Towards Digital Technology** | **0.788*** | **0.000** | **Significant** | **Reject $H_0$** |
| ***Significant @ p<0.05** | | | | |

- *Moderating Effect of Technological Content Knowledge on the Interaction between Attitude towards Digital Technology and Teachers' Classroom Supervision Competence*

The moderating effect of technological content knowledge (TCK) on the interaction between attitude towards digital technology (ADT) and teachers' classroom supervision competence (CSC) in Marilog District, Davao City were tested using hierarchical regression analysis. Results on the Table 12 shows that the Beta coefficients for the Step 1 analysis of attitude towards digital technology (ADT) and teachers' classroom supervision competence (CSC) were β= 0.105, S.E. = 0.056, p<0.05; and technological content knowledge (TCK) and teachers' classroom supervision competence (CSC) were β =0.211, S.E.=0.049, p<0.05. When attitude towards digital technology (ADT) and technological content knowledge (TCK) were included as the only independent variables (without including an interaction term), the regression model explained 63.80% of the variance in teachers' classroom supervision competence (CSC) ($R^2$ = 0.638, p< .05).

Moreover, Beta coefficients for the Step 2 analysis of attitude towards digital technology (ADT) and teachers' classroom supervision competence (CSC) were β= 0.384, S.E. = .031, p<0.05; technological content knowledge (TCK) and teachers' classroom supervision competence (CSC) were β =0.177, S.E. = 0.048, p <0.05; and moderator (ADT*TCK) and teachers' classroom supervision competence (CSC) were β =0.224, S.E.= 0.052, p<0.05. Also, it was indicated that when an interaction between attitude towards digital technology (ADT) and technological content knowledge (TCK) was added, the percentage of variance in teachers' classroom supervision competence (CSC) was 72.20% ($R^2$ = 0.722; p<0.05) indicated the independent contribution of each variable while controlling for the influence of others to create the regression equation for each analysis, after assuring significance by examining accompanying p-values. Hence, the interaction term accounted for an additional 8.40% of variance in the dependent variable ($\Delta R^2$ = 0.084). Based on the result, the null hypothesis was rejected as technological content knowledge (TCK) had significantly moderated the relationship between attitude towards digital technology (ADT) and teachers' classroom supervision competence (CSC).

The finding corroborates with the idea of Granito and Chernobilsky (2012) that teachers with positive attitudes towards digital technology are more willing to explore and experiment with various technological tools in the classroom. When they also possess a strong technological content knowledge, they feel more confident and comfortable using these tools effectively. This confidence allows them to navigate technological challenges, troubleshoot issues, and maintain a smooth classroom environment while utilizing technology. Adding more, the result supports the anchored proposition by Roth (2013) that the combination of positive attitudes and technological content knowledge fosters adaptability and flexibility in teachers. They can quickly adjust their teaching methods and approaches based on the needs of their students and the available technological resources. This adaptability allows them to take advantage of spontaneous teachable moments and adapt their classroom supervision techniques to address evolving classroom dynamics.

Lastly, the finding corroborates with Mishra and Koehler's (2006) TPACK framework that teachers with a positive attitude towards digital technology are more likely to feel comfortable using technology tools during classroom observations. This comfort level translates into increased confidence in utilizing digital tools to capture observations, take notes, and provide feedback to their peers. Teachers with strong TCK may be better equipped to identify relevant digital resources and strategies during classroom observations, allowing them to provide more context-specific feedback to their peers.

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Table 12 Moderating Effect of Technological Content Knowledge on the Interaction between Attitude towards Digital Technology and Teachers' Classroom Supervision Competence

| **Step 1** | **Teachers' Classroom Supervision Competence (CSC)** | | | | |
|---|---|---|---|---|---|
| | **B** | **Beta** | **S.E** | **p-value** | **Decisions** |
| Attitude Towards Digital Technology (ADT) | .105 | .131 | .056 | .000 | Reject $H_0$ |
| Technological Content Knowledge (TCK) | .211 | .078 | .049 | .000 | Reject $H_0$ |
| $R^2$ = 0.638 | F-value = 117.884** | | | p-value = 0.000 | |
| **Step 2** | | | | | |
| Attitude Towards Digital Technology (ADT) | .384** | .576 | .031 | .000 | Reject $H_0$ |
| Technological Content Knowledge (TCK) | .177** | .126 | .048 | .000 | Reject $H_0$ |
| Moderator (ADT*TCK) | .224** | .089 | .052 | .000 | Reject $H_0$ |
| $R^2$ = 0.722 | F-value = 132.087** | | | p-value = 0.000 | |
| ***Significant @ p<0.05** | | | | | |

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