

# Investigating the Perceptions of Grade 8 Filipino Students on Using ClassPoint in Learning Conditional Statements

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**Abstract:** *This study investigates the perceptions of Grade 8 Filipino students regarding the use of ClassPoint, an interactive instructional tool, in learning conditional statements in mathematics. A mixed-method approach was employed, involving 90 students from three academic performance groups (high, average, and less-performing) who participated in a nine-day technology-integrated instruction. Quantitative data were collected using a Likert-scale survey measuring perceptions of engagement, feedback, and conceptual clarity, while qualitative responses provided deeper insights into student experiences. Findings indicate that students across all performance levels perceived ClassPoint positively, with the most significant perceived benefits reported by low-performing students. These include increased motivation, reduced anxiety, and better understanding of conditional statements through real-time feedback and contextualized tasks. The results suggest that ClassPoint could potentially serve as an effective formative assessment and engagement tool, particularly for enhancing reasoning skills in diverse classrooms.*

## 1. Introduction

Mathematical literacy in the 21st century requires learners to not only master abstract procedures but also apply logical reasoning to solve real-world problems. One persistent area of difficulty in mathematics education is understanding conditional statements—“if-then” propositions that are foundational to logical reasoning and proof construction in geometry and beyond. These challenges are particularly pronounced in the Philippine educational context. In recent international assessments such as the Programme for International Student Assessment (PISA), Filipino students have consistently ranked below the global average in mathematical literacy, highlighting systemic gaps in conceptual understanding and reasoning skills [1]. To address these gaps, scholars and policymakers advocate for context-rich, technology-enhanced instruction as a means of improving engagement and deepening understanding [2]. Such approaches emphasize the role of digital tools in scaffolding abstract thinking, fostering interactive participation, and providing immediate feedback—all of which align with the cognitive demands of 21st-century mathematics education.

In this regard, ClassPoint, a Microsoft PowerPoint add-in, offers a promising platform for augmenting traditional classroom instruction. It allows teachers to embed interactive elements directly into their slide presentations, such as live quizzes, polls, drag-and-drop exercises, word clouds, and image upload, enabling real-time formative assessment. On the teacher’s end, ClassPoint provides automated point tracking, leaderboards, and downloadable analytics, which can inform differentiated instruction and support data-driven decision making. For students, the integration of ClassPoint potentially transforms typically passive lecture formats into interactive and collaborative learning experiences. Features such as anonymous answering, instant feedback, and gamified participation (e.g., awarding stars or badges) help lower affective barriers, especially among less confident learners. In turn, this can foster equity of voice and sustained engagement across varying performance levels. It has been reported that the use of ClassPoint as part of digital game-based learning could improve the numeracy of Grade 7 Filipino students [3]. Likewise, the integration of ClassPoint in a class of Grade 10 Filipino students was found to improve not only their mathematics performance, but also their participation and engagement [4].

In the case of the present paper, we investigated how ClassPoint could be integrated into the teaching of conditional statements in mathematics and how such integration is perceived by Grade 8 students across different academic achievement levels. Specifically, with the use of mixed methods research design, the paper aims to respond to the following research questions:

1. How do Grade 8 students perceive the use of ClassPoint in the teaching and learning of conditional statements in class?
2. What insights could be drawn from this particular intervention?

## **2. Theoretical Framework**

This research is grounded on two complementary models: the PISA Mathematical Literacy Framework and the Technological Pedagogical Content Knowledge (TPACK) framework.

### **2.1. PISA Mathematical Literacy**

PISA defines mathematical literacy as the capacity to formulate, employ, and interpret mathematics in various contexts. The framework assesses not just content knowledge but also students' abilities to reason mathematically and solve real-world problems using three core processes: formulating, employing, and interpreting mathematical problems. This particular focus on authentic, real-life application makes the PISA framework particularly relevant in assessing the efficacy of instructional tools that embed mathematics in contextualized and interactive formats—such as ClassPoint. By simulating real-world scenarios through interactive tasks (e.g., polling logical statements derived from practical examples), ClassPoint supports the kinds of reasoning and transfer demanded by PISA-style mathematics tasks. Hence, understanding how students perceive these features offers insight into how well the instruction aligns with global standards for mathematical literacy [5].

### **2.2. TPACK Framework**

The Technological Pedagogical Content Knowledge (TPACK) framework guides the integration of technology in content-specific instruction. It emphasizes the interplay between technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) to design meaningful and context-appropriate learning experiences [6]. In the context of this study, ClassPoint serves as a technological component that is extensively integrated in teaching of conditional statements—a mathematical content area that typically poses challenges for learners. The pedagogical strategy is to employ active learning and formative assessment methods (e.g., real-time quizzes, anonymous feedback), aligned with constructivist principles. The effectiveness of this alignment is best understood through student perception, which serves as an indicator of quality engagement, conceptual clarity, and instructional fit.

### **2.3. Summary**

The integration of PISA and TPACK provides a powerful lens for interpreting student feedback on ClassPoint. While PISA sets the learning goals (i.e., contextual reasoning and application), TPACK frames the instructional delivery (i.e., integrating digital tools in meaningful ways). Investigating student perceptions allows researchers to evaluate whether this alignment is experienced as beneficial to learners. For example, when students report that real-life scenarios in ClassPoint helped them understand “if-then” logic better, this reflects a positive relationship between PISA’s focus on contextual application and TPACK’s principle of content-technology-pedagogy coherence [5]. In this sense, student perceptions are not simply affective metrics but

critical indicators of whether technologically enhanced instruction supports cognitive and conceptual demands outlined in leading educational frameworks.

### 3. Methodology

The present study involved the implementation of an intervention that utilized ClassPoint in teaching conditional statements as part of the Philippine K-12 Geometry curriculum. It was carried out in a public school in Metro Manila over nine days in three Grade 8 classes. Each class was composed of 30 students (ages 13-14) and represented a particular performance level as arranged by the school (i.e., high performing, average performing, low performing). Students in each class were asked to form groups (from three to five members) and shared the use of a tablet provided by the local government. Thus, each group consisted of peers of similar academic standing and ability.

The lessons targeted conditional logic, focusing on the identification and transformation of statements (i.e., converse, inverse, contrapositive), and their application to real-life contexts. To this, different features and activities of ClassPoint were utilized and implemented in class, in which we discuss some of them below.

#### 3.1 Implementation of ClassPoint Activities in Teaching Conditional Statements

Each session lasted for 40 minutes and followed a particular structure: warm up, lesson development, guided practice, application (with feedback and reflection), and closure. Whenever appropriate and applicable, ClassPoint activities were utilized as embedded in PowerPoint presentations. These activities were designed to support conceptual understanding, foster real-time engagement, and provide immediate feedback. Below, we describe five ClassPoint activities used during the intervention, detailing their types, mathematical focus, and pedagogical intentions.

##### 3.1.1. Word Cloud

The word cloud was used as a warm-up activity to activate prior knowledge and demonstrate how conditional reasoning appears in daily life. It served as a bridge from informal to formal logic, fulfilling the PISA emphasis on context and supporting inclusive engagement, particularly among students less confident with symbolic math [7]. The task posed to students was as follows: “Think of a word about the conclusions you can give about ‘why some students decided not to go to school.’” Some sample student responses were “poverty”, “puberty”, and “because of financial problems”, possibly illustrating the social realities Grade 8 students in a public school face.

##### 3.1.2. Slide Drawing

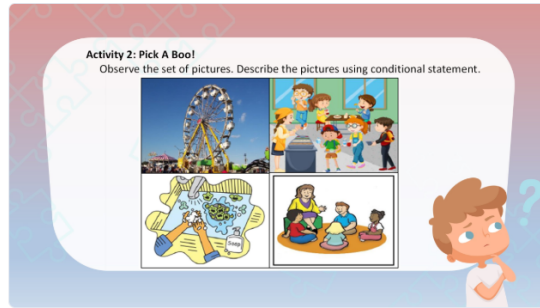
The slide drawing feature supports visual learning and allows students to engage kinesthetically with conditional statements [8]. An example activity posed to students involving the slide drawing feature was to identify the hypothesis and its corresponding conclusion by matching some given inputs to their respective outputs. Sample responses from students are shown in Figure 1.



Figure 1. Student-Generated Hypothesis-Conclusion Response

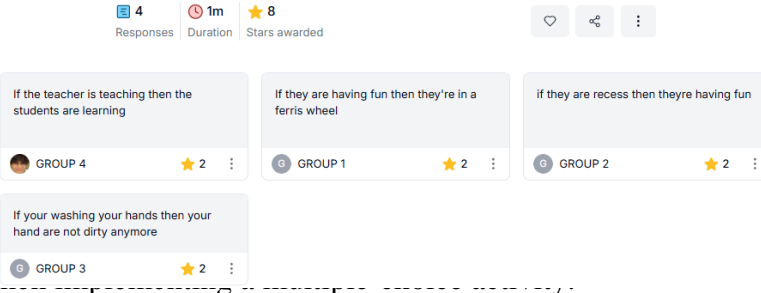
### 3.1.3. Short Answer

Another type of ClassPoint activity is for students to provide a short answer to a certain prompt. This could be seen as an opportunity to foster individual thinking and enable teachers to assess reasoning processes [9]. A sample task posed by the lead author that utilized the short answer feature is shown in Figure 2. She provided a set of four images, which is a take on a popular mobile game of the same nature, and asked students to describe the pictures using a conditional statement.

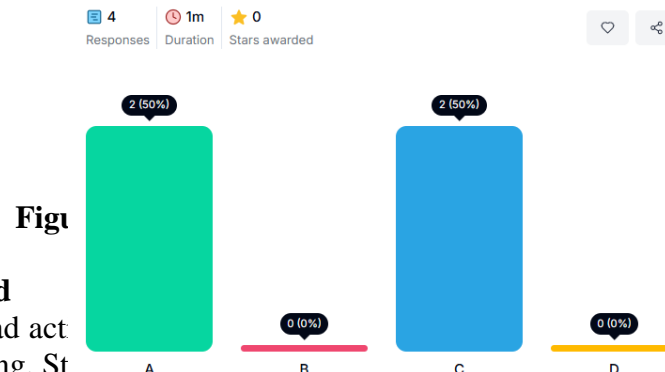


### 3.1.4. Multiple Choice

An instance where the author identified the converses with TPACK by leveraging the PISA process of instantly visualizing misconceptions were on the side of ClassPoint with

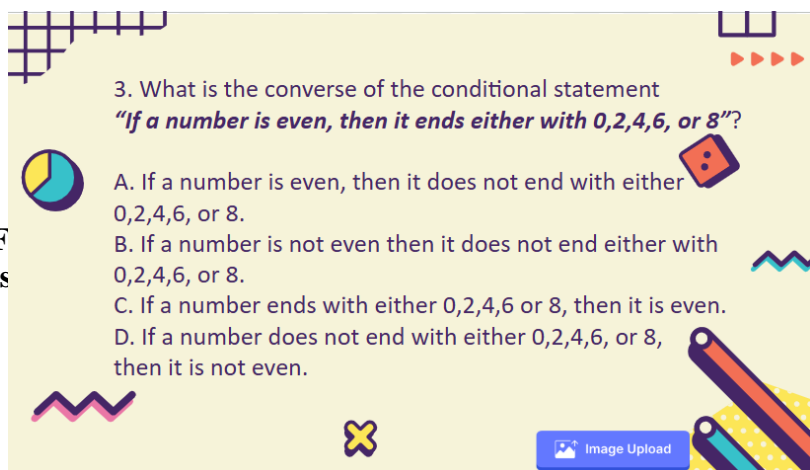


students' ability to assessment aligned It also aligns with re. Teachers could t view. Possible shows the teacher



### 3.1.5. Image Upload

The image upload activity supports interpretation and modeling, as outlined in PISA, and promotes student-generated content through TPACK-aligned digital tasks [7]. Figure 4 shows an example of the lead author's use of the image upload activity, in which she tasked students to actually write their attempts and responses and have these photographed and uploaded for her to view and check.



### 3.2. Research Design

The study follows a convergent mixed method design [10] in which both quantitative and qualitative data were gathered and analyzed alongside each other. A two-part survey questionnaire was developed by the lead author and was subsequently validated by her project supervisor (the second author). The goal of the questionnaire was to elicit feedback from the students on their experience of learning conditional statements with ClassPoint. The first part consists of six 4-point Likert scale items, which measured the students' level of agreement with certain aspects of their experience with ClassPoint. The scale ranged from strongly disagree (represented numerically as 1) to strongly agree (represented numerically as 4). The mode from the survey responses are reported in this study. The six items in the survey questionnaire are as follows:

- B1: The use of Classpoint quizzes helps me evaluate my understanding of conditional statements.
- B2: ClassPoint's interactive quizzes and polls help correct my misconceptions about conditional statements.
- B3: The immediate feedback from ClassPoint activities motivates me to engage more with the modules on conditional statements.
- B4: The real – life scenarios applied in ClassPoint discussions make the concept of "if-then" statements easier to grasp.
- B5: I find that ClassPoint activities are well-aligned with the classroom discussions on conditional statements.
- B6: I would recommend the continued use of ClassPoint for classroom discussions and activities in future lessons.

Meanwhile, the second part of the survey questionnaire is an open-ended response item in which students were asked to share their thoughts on the use of ClassPoint in their class. The prompt given was “How do you feel about the use of technology for the interactive discussion?” In addition, the lead author's classroom notes and reflections on the implementation also serve as qualitative data in this study, complementing the survey results. These were qualitatively analyzed to generate possible themes that capture the perceptions of students on the use of ClassPoint.

## 4. Results and Discussion

### 4.1 Quantitative Results

For the quantitative results of the study, Table 1 shows the modal score for each survey item across each class.

Item	High Performing	Average Performing	Low Performing	Overall Mode	Interpretation
B1	4	3	3	3	Agree
B2	4	3	3	3	Agree
B3	3	4	3	3	Agree
B4	4	4	3	4	Strongly Agree
B5	4	4	4	4	Strongly Agree
B6	4	4	4	4	Strongly Agree
Overall	4	4	3	4	Strongly Agree
Interpretation	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree

**Table 1.** Modal score per survey item per class

Quantitative results revealed strong agreement with statements highlighting ClassPoint's role in enhancing understanding, correcting misconceptions, and increasing motivation. It could be gleaned that students have a positive perception of the use of ClassPoint in their mathematics class, at least in the teaching and learning of conditional statements. These results suggest that ClassPoint has the potential to positively reinforce mathematics learning. First, it could support conceptual clarification through formative checks. For example, in a multiple-choice ClassPoint quiz, students were asked to identify the contrapositive of the statement: *"If a person is vaccinated, then they are less likely to be infected."* After submitting their answers, a live bar graph displayed class responses, revealing common errors such as confusing the contrapositive with the converse. This allowed the teacher to immediately clarify the correct logic and address misconceptions. This activity helped students distinguish between related forms of conditional statements by making abstract logic visual and interactive.

Second, integrating ClassPoint could promote engagement especially among struggling learners, by making participation less intimidating and more interactive. For example, during a short answer activity, students were asked to submit real-life "if-then" statements (e.g., *"If it rains, then I will bring an umbrella"*). This allowed even shy students to contribute anonymously and see how logic applies to everyday situations. The activity served as a low-stakes entry point into formal conditional logic and increased participation across ability levels. It aligns with research showing that interactive digital tools improve engagement and reduce anxiety [2].

Lastly, the use of ClassPoint could enhance the alignment between technology and pedagogy from the perspective of students, by integrating digital tools directly into content delivery. In one lesson, students used the image upload feature to submit photos representing conditional scenarios (e.g., a person watering plants for *"If a plant is watered, then it grows"*). The teacher then guided students in translating these into formal logical forms. This activity connected real-life contexts with symbolic reasoning, showing students how technology can support both learning and expression. It reflects TPACK's emphasis on meaningful tech-content integration [6].

Moreover, it is worth noting that students from the low-performing class looked at the use of ClassPoint positively, especially with respect to items B3 (motivation from immediate feedback), B4 (use of real-life examples), and B6 (recommendation for continued use). They seem to perceive ClassPoint as one that functions not only as a motivational scaffold, but also as an instructional equalizer. These outcomes align with the TPACK framework [6], which emphasizes the importance of harmonizing content, pedagogy, and technology to create meaningful learning experiences. More so, this highlights a possible measure to support struggling learners and make mathematics learning more inclusive through the use of technology.

#### **4.2. Qualitative Results**

The qualitative analysis of open-ended response items, along with the lead author's notes from the classroom implementation and personal reflection, reveals three themes that shed a positive note on the use of ClassPoint. The first theme is on building confidence through anonymity and equity. The use of ClassPoint was found to encourage participation from students, especially those who described themselves as shy or wary of delivering incorrect answers in front of the class. This could also be interpreted as having ClassPoint provide equity of voice and participation to its learners. Below are some translated responses from students, labeled accordingly based on the performance class they belong.

A1: I enjoy seeing other students' answers anonymously. It made me feel more confident to try.  
A2: Sometimes I get nervous to recite, but ClassPoint helped me participate without pressure.

The second theme centers on immediate feedback, which is a vital component of the teaching-learning process. Students appreciated how the use of ClassPoint could allow their teacher to provide feedback to the entirety of the class, and in turn, aid students reflect on their mistakes. Quoting several students, translated to English:

H1: Technology like ClassPoint helps make lessons efficient. I like the instant checking of answers.  
H2: The interactive format made it easy to spot where I went wrong in logic problems.  
L1: It helped me understand the topic more because I saw what others answered and learned from it.

Lastly, the third theme tackles engagement and focus. Students perceived the use of ClassPoint to be conducive to increased motivation and sustained attention. They found that the implementation was a welcome change from the usual way their mathematics classes were held, which supported their involvement and participation in class. Below are some translated responses from the students.

H3: It's a nice change from the usual whiteboard method. It keeps things interesting.  
A3: ClassPoint is fun to use, and it helped me understand better because the teacher explained the results afterward.  
L2: The technology helped me not get bored and I actually understood the examples more clearly.  
L3: It was easier to focus when there were polls and quizzes. I wanted to get it right.

### **4.3 Integration of Qualitative and Quantitative Results**

Integrating the quantitative and qualitative findings reveals that across all class levels, ClassPoint activities seemingly improved student participation and, likewise, enabled real-time formative assessment. For example, anonymous polls helped address misconceptions without discouragement, and image uploads connected abstract logic to visual reasoning. Moreover, it could be possible that through the structured ClassPoint activities and subsequent peer discussions, students were observed to have progressed from surface reasoning (e.g., assuming converse statements were true) to being able to demonstrate better precision and justification, especially in distinguishing logical variations (e.g., inverse, contrapositive). In addition, students appreciated how ClassPoint made abstract logic more concrete through real-life scenarios, visual prompts, and live, anonymous responses. These affordances supported students in developing a more robust understanding of logical structures—such as the converse, inverse, and contrapositive—while also facilitating peer learning and reflective thinking. Moreover, the use of ClassPoint aligns with the objectives of PISA, which advocates for instruction that fosters problem-solving and mathematical reasoning in real-world contexts. By embedding tasks that mirror PISA-style scenarios, the ClassPoint activities helped students engage in processes of formulating, employing, and interpreting mathematics as outlined in the PISA 2022 Mathematical Literacy Framework [5].

Although this paper focuses on students' perceptions on the use of ClassPoint, the researchers would like to highlight the potential contribution of the intervention towards student learning and achievement, which are corollary to the aforementioned findings. In the high-performing class, they excelled in symbolic manipulation and perhaps benefited from deeper reasoning tasks. For

example, when asked to distinguish among the converse, inverse, and contrapositive of a given conditional statement, students not only identified these forms correctly but also constructed their own valid conditional chains. In one ClassPoint quiz, several students correctly answered:

*Given statement:* "If a number is divisible by 4, then it is even."

*Question:* "Which of the following is the contrapositive?"

*Choices:*

- A. If a number is not divisible by 4, then it is not even.
- B. If a number is even, then it is divisible by 4.
- C. If a number is not even, then it is not divisible by 4. (correct answer)
- D. If a number is not divisible by 4, then it is even.

These students selected the correct response (Letter C) and were able to explain the logic behind it during the follow-up discussion. This group appeared to benefit from the self-paced, logic-intensive tasks, such as polls followed by reflection questions, which demanded metacognitive engagement. Their responses suggest that ClassPoint's real-time feedback and challenge-level matching fostered deeper analytical thinking consistent with the *employ* and *interpret* competencies in the PISA framework [5].

Meanwhile, in the average performing class, they were observed to be conducive towards visual aids and peer discussion, which have been incorporated in the ClassPoint tasks. For instance, the use of image upload tasks (e.g., submitting photos that represent a conditional situation such as "*If the red light is on, the machine is active.*") allowed them to contextualize abstract logic in familiar settings. Students then participated in whole-class discussions where conditional forms were derived from the images they provided. This multimodal approach aligned well with their learning profile and enhanced their ability to grasp the syntactic structure of conditional statements. Furthermore, features such as anonymous responses and live result displays facilitated low-stakes participation and social learning, allowing them to compare and revise their understanding in real time.

As for the low performing class, they required scaffolding but showed noticeable improvement in independent reasoning by the end of the intervention. Initially, these students exhibited difficulty distinguishing between the original and converse forms of conditional statements. However, through repetitive exposure to poll-based diagnostics and teacher-led correction of misconceptions (e.g., using ClassPoint to show aggregated wrong answers and then discuss them), they gradually developed independent reasoning skills. For example, by the final sessions, several students who initially selected incorrect inverses in a quiz began constructing their own valid conditionals when prompted. One low-performing student uploaded an image of a seatbelt and correctly stated: "*If you are in a moving car, then you must wear a seatbelt.*" This reflected a shift from surface pattern matching to a basic logical application grounded in real-life understanding. The gamified elements of ClassPoint, such as star points and leaderboards, also appeared to boost motivation and task completion, supporting the claim that technology can serve as a motivational scaffold [2].

## **5. Conclusion**

This study investigated the perceptions of Grade 8 Filipino students on the use of ClassPoint, an interactive digital add-on to Microsoft Powerpoint, in learning conditional statements. Using a mixed-method approach, the study captured both quantitative ratings and qualitative insights from students across high-performing, average, and low-performing groups following a nine-day technology-integrated instructional intervention. Findings indicate that

students across all performance levels perceived ClassPoint as an effective and engaging instructional tool.

Overall, the study affirms that integrating technology, in this case ClassPoint, within a TPACK-informed instructional design could enhance the learning of mathematics. The positive student perceptions—particularly among those with lower prior achievement—demonstrate the tool’s potential to democratize participation and deepen understanding through feedback-rich, context-sensitive learning. Future studies are encouraged to replicate this approach in other strands of mathematics and to examine long-term learning outcomes. Additionally, sustained professional development is needed to equip teachers in designing and implementing effective digital learning environments that align with both local curricula and global competency standards such as those defined by PISA.

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