

## **Notetaking Strategies in Three Middle Level Classrooms**

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### **Abstract**

*Understanding how to take notes is an important skill that is needed across grade levels and content areas, however many students are not taught how to successfully take notes. The focus of this study was to evaluate the effectiveness of three notetaking strategies: doodle, foldable, and graphic organizers, for middle level learners in 4th, 6th, and 9th grades. The study examined the importance of explicit notetaking instruction, and the impact that these notetaking strategies had on student learning. The study found that 4th and 6th grade students preferred notetaking strategies that fostered creativity, but 9th graders simply expressed a need for explicit instruction and support in how to take notes. The study found that there was not one perfect notetaking strategy, instead, students need a variety of options that work for the individual and their learning styles. What is needed is explicit notetaking instruction so that students can support and advance their learning.*

### **What Is Notetaking and Why Is It Important**

Merriam-Webster's (2020) dictionary defined notetaking simply as *the act or process of taking notes*. In schools, students are expected to take notes so that they can learn and retain the content material, however, many students do not understand how to take notes. Knowing how to take notes is a skill that students are expected to know, however, as students reach high school and college levels, it becomes more evident that they do not have the skillset to successfully take notes and use notes to support learning (Cohen et al., 2013). It is imperative that teachers start teaching students how to take effective notes so that they can comprehend and retain information (Boyle, 2011).

Notetaking is an important academic skill, and research has shown that explicit notetaking instruction may benefit students across a wide range of content and grade levels (Boyle, 2011; Cohen et al., 2013; Itler, 2017; Scott &

Dreher, 2016; Ukrainetz, 2019). However, the act of taking notes may be difficult for many students because they have not been taught the skill of *how* to take effective notes (Austin et al., 2004). Explicit instruction in notetaking is needed because students may not understand the positive impact that effective notes can have on learning. Notetaking can enable students to access the information they receive, whether that be for homework, quizzes, a test, or information they need in order to move on to the next chapter. The need for explicit and specific instruction in notetaking is clear. Effective notetaking can support not only academic success and retention, but also improve future learning (Cohen et al., 2013). The goal of this study was to examine the impact of three different notetaking strategies on middle-level learners.

### ***Notetaking and Comprehension***

Comprehension is an important goal in learning and one way that students can demonstrate their understanding is through effective notetaking (Cohen et al., 2013). Notetaking can benefit and support student learning by enabling them to add to their schema by building on to prior knowledge (Chang & Ku, 2015; Cohen et al., 2013). Notes that are specific, purposeful, and accurate can enable students to recall and retain information, as well as build on prior knowledge. Boyle (2010) found that when students were given strategic notetaking instruction, they performed higher on recall and comprehension assessments. Chang and Ku (2015) confirmed the positive correlation between comprehension scores and explicit notetaking instruction. Notetaking provided a deeper understanding and contextualization of knowledge for college students who received intervention in the form of guided notes as a way to support lectures (Cohen et al., 2013). The study found that with explicit instruction, via guided notes, benefited all students at the top, middle, and bottom of the class. This was evidenced by the improvement on tests and quizzes that were used to measure learning. As such, explicit notetaking instruction has been shown to support comprehension and retention of knowledge (Aragón-Mendizabal et al., 2016; Austin et al., 2004; Boyle, 2010; Williams et al., 2012).

### ***Notetaking Supports Working Memory and Learning***

Notetaking not only supports comprehension, it can also help the retrieval process in working memory (Cohen et al., 2013; Itler, 2017; Ukrainetz, 2019). The Generative Process of Comprehension theory identified that the brain's understanding of material comes from the process of generating relations between prior knowledge, concepts, and/or the new information being learned (Wittrock, 1992). Working memory is the brain's processing that occurs when the individual is able to recall and manipulate the content that had been learned (Aragón-Mendizábal et al., 2016; Scott & Dreher, 2016; Wetzels et al., 2011). Research has shown that notetakers outperformed students who simply reviewed the material (Herbert, Graham, Rigby-Wills, & Ganson, 2014). The study found that students who took notes demonstrated greater performance regardless of their prior knowledge and ability level. Notes can also help the learner to understand the relationship between and across topics, as well as to keep track of their connections to the information (Hagen, Braasch, & Braten, 2014). Boyle (2011) confirmed that in addition to better comprehension, students demonstrated long term recall of the content. Engaging with the content material, recollecting, reorganizing, and restructuring are all a part of the learning process that is supported by notetaking (Cohen et al., 2013).

### ***The Instruction of Notetaking Strategies***

Notetaking is generally not taught in classrooms. The most common method of notetaking often involves copying down or transcribing everything that was spoken in a lecture. Wan-Chen and Yu-Min (2015) found that when instructed to take notes, the students simply copied the PowerPoint verbatim. The study found that students' efforts of writing down everything caused them to be *lost* in the minutia and miss key points from the lecture. Additionally, while teachers may have expectations for what notes *should* look like, this often did not align with students' understanding and perception of notes (Boyle, 2011; Hagen et al., 2014; Itler, 2017; Wan-Chen & Yu-Min, 2015). Students may *feel* like they are doing something productive when copying verbatim, however the effectiveness of those notes are questionable and research has shown that student's notes often may have a randomness and/or lack cohesion (Wan-Chen & Yu-Min, 2015; Wang et al., 2017). As such, current notetaking practices are not effective, nor do they support student's learning processes. Boyle (2011) found that when

students used strategic notetaking methods, they retained information better than *traditional* notes written verbatim. The study showed that explicit instruction of notetaking strategies provided students with a stronger foundation for how to grasp the concepts they were learning. Similarly, Itler (2017) identified that when students were provided with explicit notetaking instruction, there was a significant increase in the comprehension, and students were better able to “capture important concepts and make meaningful connections” (p. 597). As such, there is a need to explicitly teach students *how* to take notes, i.e. provide explicit notetaking instruction.

Various research efforts have shown the effectiveness of explicit notetaking strategies (Boyle, 2011; Chang & Ku, 2015; Risch et al., 1990; Scott & Dreher, 2016; Ukrainetz, 2019; Wan-Chen et al., 2015; Wang et al., 2017). Risch et al. (1990) found that students who utilized a graphic organizer matrix for notetaking, made stronger connections and mental relationships than those who took notes on blank notebook paper. Similarly, Wan-Chen and Yu-Min (2015) discovered that students who used visual and graphic notetaking strategies performed better and had stronger connections than their peers. Ukrainetz (2019) conducted a study on Sketch & Speak (pictographic) notetaking intervention. The study found dramatic differences in the *quality* of notes, and the students reported that the strategy impacted their abilities to recall and retain information, as well as enabled them to be more organized and efficient. Students need explicit instruction on how to take notes. Notetaking strategies can be a powerful tool that can provide a foundation from which to build learning. This is a foundation that can enable students to make stronger connections and retain knowledge throughout their schooling.

## Methods

### Context & Participants

The participants consisted of middle level students in three content areas, across three school districts: urban school district (9th grade), village school (6th grade), and a rural school district (4th grade). The Ohio Department of Education (ODE 2019) data on school demographics showed a wide breadth of differences across the participants. The urban school with the 9th grade class was identified as 100% *economically disadvantaged*, the *economically disadvantaged* for the 6th grade students in the village school was 33%, and 49% for the 4th grade students in the rural setting.

### Tables & Figures

**Table 1. Demographics of the Participants**

Grade Level & Content	Total Participants Boys : Girls	School Demographics	Economically Disadvantaged (Free/Reduced Lunch)	IEP, 504 Plans, & Gifted Learners
4th Grade Math	18 Students: 7 Boys : 11 Girls	Rural School District	49.4%	1 IEP/504 Plan 2 Gifted
6th Grade Social Studies	19 Students: 11 Boys : 8 Girls	Village School District	33.4%	1 IEP/504 Plan
9th Grade Language Arts	18 Students: 9 Boys : 9 Girls	Urban School District	100%	1 IEP/504 Plan 10 Gifted

### Data Tools: Pre-/Post-Survey

The pre-/post-survey provided an understanding of students' perceptions towards notetaking strategies. The survey consisted of Likert-scale questions and open-ended questions. The questions ranged from general

perceptions about note taking, what students did when taking notes, and their enjoyment in taking notes using the various strategies. The survey provided a way to gauge students' prior knowledge and understanding of notetaking strategies, as well as their attitudes towards the threenotetaking strategies that were taught.

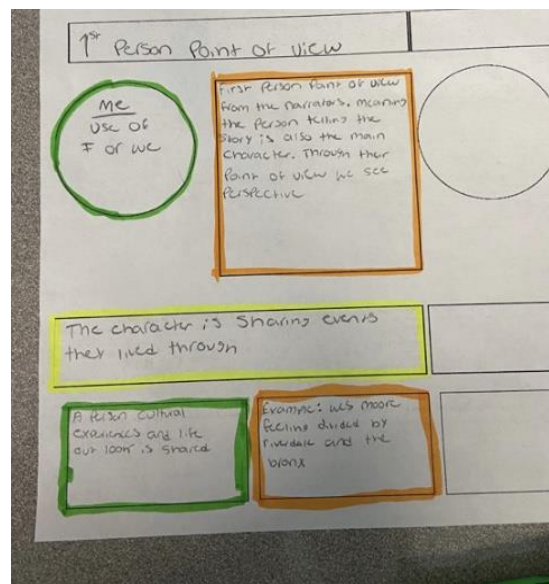
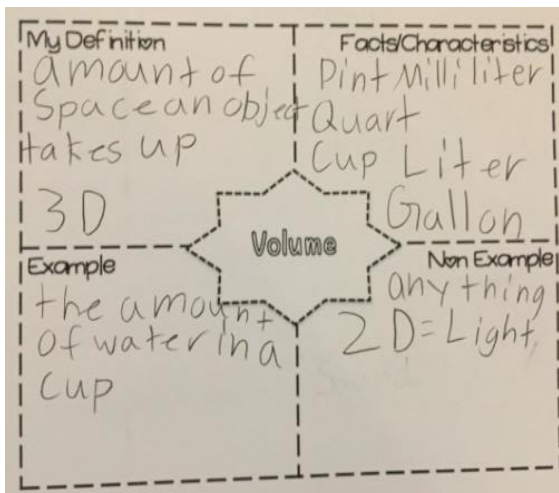
### Notetaking Strategies

The three notetaking strategies utilized in this study were: graphic organizers, doodle notes, and foldables. These strategies were selected because of their applicability across a wide array of grade levels and content areas. Additionally, each of these strategies enabled different approaches to notetaking, tapping into structured, creative, and tactile notetaking strategies.

### Graphic Organizer

Graphic organizer, aka. diagram, provided the students with text boxes that contained various types of information that students filled in. Information on main points, supporting details, definition, examples/non-examples, interesting facts, etc. Graphic organizers provided students with structure in identifying important concepts and ideas from the instruction. Figure 1 shows two examples of the graphic organizer notetaking tools from a 4<sup>th</sup> grade and 9<sup>th</sup> grade participant.

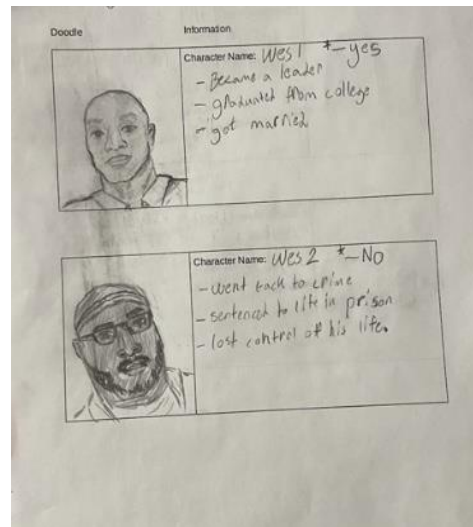
Figure 1. Two Graphic Organizer Examples



### Doodle Notes

Doodle notes are a type of visual notetaking strategy in which students draw or doodle key elements, specific details, ideas, insights, and thoughts related to the content. Students were permitted to color code, draw symbols, draw pictures, and/or make visual representations to help make mental connects to the content material. Figure 2 shows two doodle note examples from a 6<sup>th</sup> grade and 9<sup>th</sup> grade participant.

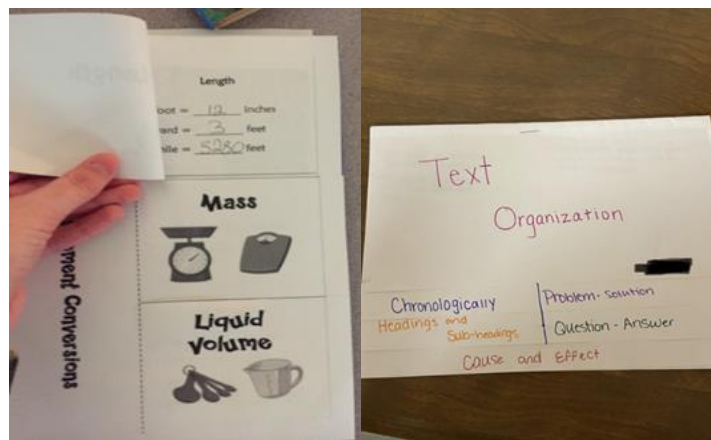
**Figure 2. Two Doodle Notes Examples**



**Foldables**

Foldables served as a tactile notetaking strategy in which students folded, cut, and manipulated a template. This strategy provided a hands-on experience by having students create flaps, doors, openings, etc. (similar to a *lift-the-flap* and *cootie catcher* concept). Figure 3 shows three examples of the foldable notetaking strategies from a 4<sup>th</sup> grade and 9<sup>th</sup> grade participant.

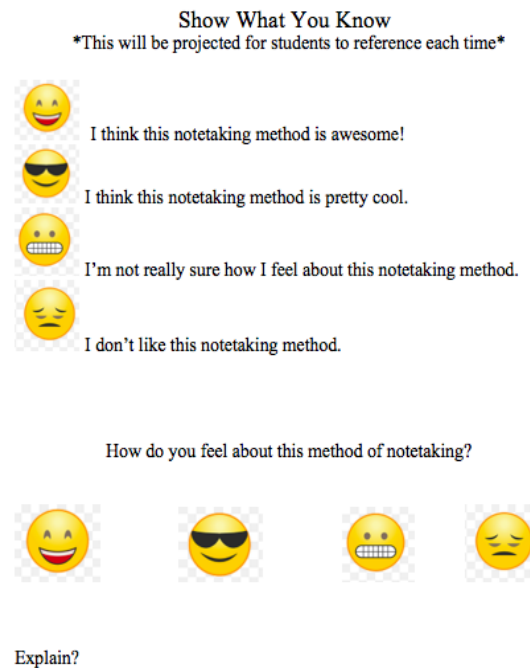
**Figure 3. Three Foldable Examples**



**Exit Slips: Comprehension and Preference Checks**

At the end of each notetaking strategy, students were given an exit slip to complete. The exit slips were called, "Show What You Know" (SWYK). Each SWYK contained multiple-choice comprehension questions and open-ended questions regarding students' opinions about the strategy. Figure 4 shows an example of the SWYK.

**Figure 4. Comprehension and Preference Check**



### ***Procedures***

This 5-week study was conducted by three middle level, initial licensure, student teachers across 3 grade levels and content areas. Week one consisted of pre-survey data and background information regarding students' understanding and knowledge of notetaking and notetaking strategies. Weeks two through four consisted of explicit instruction on each of the three notetaking strategies, beginning with the graphic organizer, then doodle notes, and foldables in the fourth week. Each week, the teacher began by modeling each notetaking strategy via a gradual release model, i.e., "I do, we do, you do." The notetaking strategy was first modeled, then students practiced the notetaking strategy together, which led to students' independent use of each notetaking strategy throughout the rest of the week. At the end of each week, students were given an exit slip (SWYK) to gauge learning and preference for each strategy.

### ***Results***

As the study began, graphic organizer, doodle notes, and foldables were explained and described to the students. While each strategy might not have been used as a notetaking strategy, the students expressed a general familiarity of each strategy. The students were surveyed regarding their prediction of enjoyment for each notetaking strategy, i.e., whether they might enjoy using each for notetaking purposes. These answers (Table 2) provided insight into the students' prior understanding of each strategy and if the strategy description sounded exciting, i.e., potential enjoyment.

**Table 2. Pre-Survey: Prediction of Preference**

Classroom	Notetaking Strategy	Strongly Agree	Agree	Disagree	Strongly Disagree
4 <sup>th</sup> grade classroom	Graphic Organizer	1	7	9	1
	Doodle Notes	9	4	4	1
	Foldables	2	11	3	2
6 <sup>th</sup> grade classroom	Graphic Organizer	1	3	9	4
	Doodle Notes	8	2	4	3
	Foldables	7	2	6	2
9 <sup>th</sup> grade classroom	Graphic Organizer	2	8	5	2
	Doodle Notes	2	6	5	5
	Foldables	1	7	6	4

Overwhelmingly, 4th grade students and 6th grade students identified doodle notes and foldables as their first and second choices for the best potential enjoyment, and graphic organizers were selected as least. In contrast, the 9th grade students did not have a clear preference, instead they nearly equally identified that they would potentially enjoy working with all three methods of notetaking strategies. The pre-survey data showed that younger students predicted they would enjoy or prefer the notetaking strategies that “sounded fun”. At the end of the study, a post-survey was conducted to gauge student preference after being exposed to all three strategies (see Table 6).

### *Three Notetaking Strategies*

Data was collected on each of the three notetaking strategies. Tables 3, 4, and 5 showed students’ responses regarding each strategy: graphic organizer, doodle notes, and foldables, and their feelings about each strategy.

#### *Graphic Organizer*

At the end of week 2, students were asked to share their responses regarding the use of graphic organizers: “Did students enjoy using graphic organizers to help them comprehend the information?” Table 3 shows the students’ responses to this question.

**Table 3. Graphic Organizer Response**

Graphic Organizer Response by Class	Awesome	Pretty Cool	Not Sure	Don't Like
4th	1	8	7	1
6th	3	9	3	1
9th	1	7	10	0

Overwhelmingly, “pretty cool” and “not sure” were the most common responses in all three classes. While some students stated that it benefited them: “I feel more organized”, “The boxes made it easier for me to understand”,

and “I can use it to study”, others stated: “I have to write too much and they are boring”, “The note taking is to complicated”, and “we always do these.” At the end of the week, the students were given a SWYK comprehension exit slip regarding their understanding of the content, as supported by the notetaking strategy used that week. There were a wide range of scores across the grade levels.

**Figure 5. Graph 1: Graphic Organizer Scores**

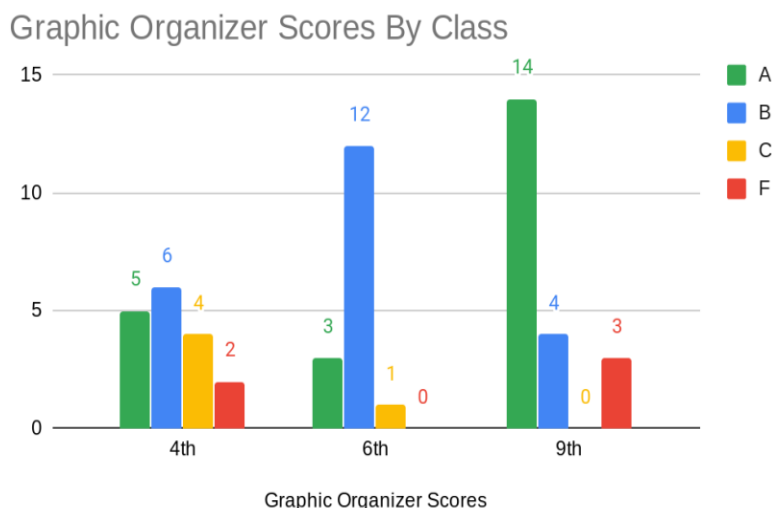


Figure 5 shows that for the graphic organizer, 4th grade class ranged from an “A” grade (5 students), to an “F” grade (2 students). In the 6th grade class, most students (12 students) scored a “B” grade, while for the 9th grade students, the typical grade was an “A” (14 students). When compared to the students’ responses that graphic organizers were “Pretty Cool” and “Not Sure”, the data alludes to a potential developmental growth regarding the applicability and use of the graphic organizers. In essence, while this tool might have been effective for the 9th grade participants, there was clearly a gradual developmental improvement from 4th to 6th to 9th grades regarding the graphic organizer.

**Doodle Notes**

The second notetaking strategy that was taught and utilized were doodle notes. At the end of week 3, students were asked to share their responses regarding the use of doodle notes: “Did students enjoy using doodle notes to help them comprehend the information?” Table 4 shows the students’ responses regarding their perceptions of doodle notes.

**Table 4. Doodle Notes Response**

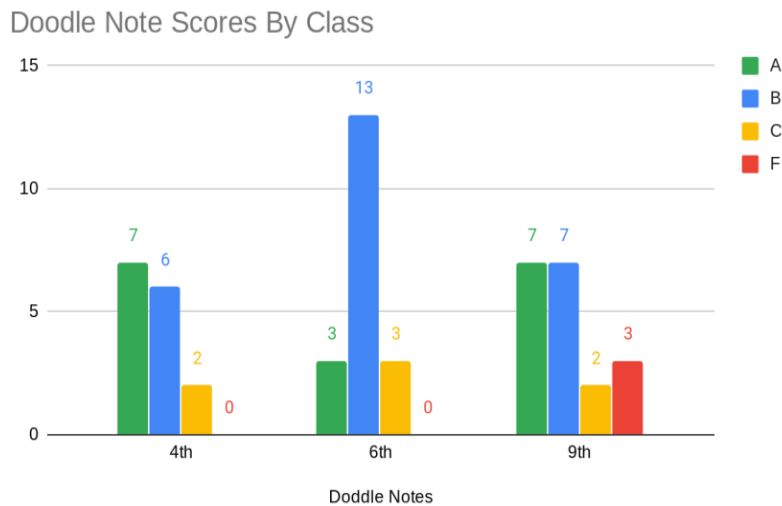
Doodle Notes Response by Class	Awesome	Pretty Cool	Not Sure	Don't Like
4th	9	5	1	0
6th	7	7	4	1
9th	3	10	6	1

This strategy was positively received by the 4th and 6th grade classes, whereas the 9th grade students were more in the middle regarding their reactions. While there were only two students who did not like this strategy (one 6th grade and one 9th grade student), the overwhelming majority identified that doodle notes were “Awesome” or “Pretty Cool”. Comments such as, “It is so fun to do and helps me learn”, “Coloring helps me focus”, and “It



helps me relieve stress because I get to doodle” showed that this was a strategy that not only engaged their thinking and supported focused attention, but also helped to alleviate stress. While there were no strongly negative comments, neutral-negative comments such as, “doodles aren’t notes”, “I can’t doodle and listen at the same time”, and “It doesn’t help me study, memorize, or learn things like regular notes”, showed that either this strategy did not work for those students, or they did not perceive it as a learning tool. In comparison, the SWYK data (see Figure 6) showed that doodle notes had a more positive impact on learning for the 4th and 6th grade students. While no students in either of these grades received an “F” grade, the data shows that this strategy did not work for all of the 9th grade students. Figure 2 shows an example of the doodle notes notetaking method used in the sixth-grade social studies classroom.

**Figure 6. Graph 2: Doodle Note Scores**



**Foldables**

The third notetaking strategy that was utilized were foldables. After foldables had been taught and used, students were asked to share their responses regarding the benefits of this strategy; “Did students enjoy using foldables to help them comprehend the information?”

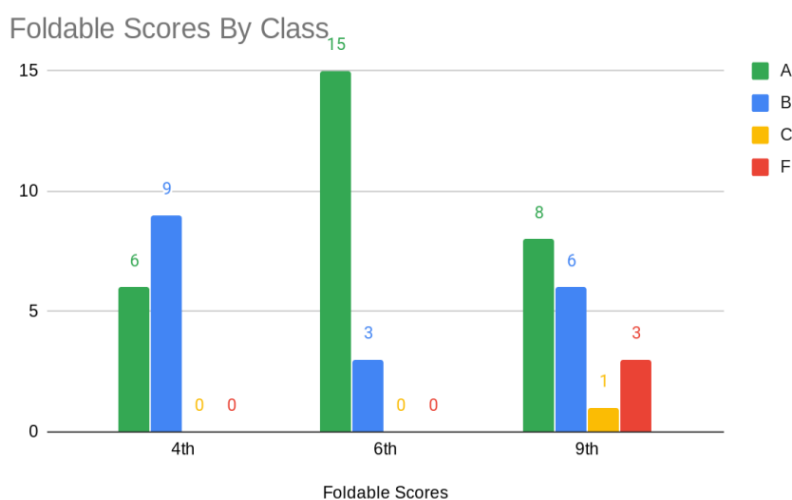
**Table 5. Foldable Response**

Foldable Response by Class	Awesome	Pretty Cool	Not Sure	Don't Like
4th	7	6	2	0
6th	9	6	2	1
9th	0	5	6	7

Similar to doodle notes, this strategy was popular with the 4th and 6th grade students. While some of the 9th grade students were neutral identifying that foldables were “Pretty Cool” or “Not Sure”, there was a significant number that identified that they did not like this strategy (7 students). Comments such as, “Really really don't like it” and “I just don't like the effort I have to put into folding them” were balanced with more positive comments such as, “It’s quick fun and effective” and “I think this way of notetaking is easy for me to understand and is really fun.” Comparison between the pre-/post-survey data regarding foldables showed that the younger grades (4th and 6th grade classes) enjoyed the strategy more than the older 9th grade students. Interestingly, the enjoyment of foldables appeared to have a positive impact on learning. All students in both 4th and 6th grade

classes achieved positive scores (“A” and “B” grades) after this strategy was utilized which alludes to the importance of enjoyment in learning.

**Figure 7. Graph 3: Foldable Scores**



Towards the end of the study, after students had been exposed to all three strategies, students were asked to rank their favorite, most preferred to least preferred strategies. Table 6 shows that doodle notes were the most preferred, followed by foldables, and graphic organizer was the least preferred notetaking strategy.

**Table 6. Post-Survey, Preference Result, Number One Ranking**

Number One Preference	Graphic Organizer	Doodle Notes	Foldables
4th	0	13	6
6th	1	8	10
9th	6	11	5

The 4th and 9th grade students overwhelmingly preferred doodle notes, and it came in as a close second for the 6th grade students, after foldables. The effectiveness of doodle notes can be seen in comments such as, “It is so fun to do and helps me learn,” “It’s a creative way to learn,” and “Coloring helps me focus.” The data also showed that graphic organizers were the least preferred strategy across all grade levels, however, for the 9th grade students, when viewed with the student comprehension scores, graphic organizers showed the most positive scores (14 “A” and 4 “B” grades), which was 75% of the 9th grade class, which alludes to developmental differences regarding preferences across the three notetaking strategies.

### Discussion

Notetaking strategies can benefit and support student’s learning. This study found that explicit instruction of explicit notetaking strategies: doodle notes and foldables, had an overall positive impact on students’ comprehension and learning. While the positive impact of each strategy was not equal, nor were they equally received by the participants, the message was clear - students need explicit instruction in how to take notes. Two themes that emerged from the results were that a) all notetaking strategies are not equal in supporting student learning, and b) students need to be provided with explicit instruction with a variety of notetaking strategies.

Notetaking strategies are not equal in supporting student learning. While this study explored three notetaking strategies, the students expressed different preferences based on grade levels. The two younger grades preferred doodle notes and foldables, which provided more creativity within a looser definition of *taking notes*. The ninth-grade students did not have strong preferences towards one specific type, and all three were equally received (see Table 2 and 6 for the #1 rankings of the strategies). In addition to student preferences, the data also revealed that these preferences did not necessarily align with learning and growth (see Figures 5, 6, and 7). While doodle notes were most popular (“It’s way easier to draw than write.”), the comprehension scores showed that this strategy was not the most effective in helping the students to retain information. When students ranked their preferred notetaking strategy, they were not taking into account if that notetaking strategy improved their learning. The results lead to understanding that student’s preferences and enjoyment may not necessarily correlate to being the most effective. This leads to the importance of providing students with a variety of notetaking strategies.

We assert that there is not one perfect form of notetaking strategy, and that a variety of strategies should be explicitly taught. The study found that students in the younger grades preferred the notetaking strategies that enabled their creativity and expression. We believe that this is a part of developmental preferences. Generally, students in the younger grades are developing an understanding of their learning styles and as such, comments such as “Coloring helps me focus” and “It’s way easier to draw than write,” leads us to believe that students in the younger grades sought ways to express and connect with the learning in creative ways. The more creative notetaking strategies, the stronger sense of enjoyment. In contrast, students in older grades, while still appreciating some creativity, also expressed a need in more structured form of notetaking, as evidenced by comments such as, “The boxes made it easier for me to understand” and “I can use it to study.” While we explored three notetaking strategies in this study, there are many other notetaking strategies and it is our hope that teachers will use this study as a spring board in providing explicit instruction of notetaking strategies.

### **Conclusion**

Notetaking is an important skill that students need to develop as they continue through their school career. Taking effective notes can support comprehension and retention of the content materials. There is a need for explicit instruction of notetaking strategies and by providing students with a variety of notetaking strategies, from structured to more creative, can enable students to select the type that best suits their learning style and preferences. In this way, educators can provide students with opportunities to make meaningful connection with the content being learned, and support deep learning and retention of the content material. Explicitly teaching notetaking strategies can enable students to understand the value of notes, which will impact their future learning across grade levels and content areas.

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