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Secondary School Students' Habits of Using Note-Taking Strategies

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Abstract. Note-taking is summarizing what one has understood in one's own words to remember it later. Note-taking is one of the most important writing activities in passing the information acquired through listening from temporary memory to permanent memory. In this study, 5 different strategy training were given to 7th-grade students for 6 weeks. After the training on each strategy was given to the students, they were expected to apply the relevant note-taking strategies after the listening texts. Multiple cases and holistic multiple case design, which is one of the case study types, were used in the research. The note-taking papers of the students were evaluated according to the criteria of the strategies. Student opinions were coded by subjecting content analysis and the findings were interpreted. As a result of the study, it was determined based on the student interview forms that before the note-taking training was given, the students could not take notes because they had difficulty in distinguishing between necessary and unnecessary information and that in the Cornell strategy, students had difficulty in identifying key words while listening. It was seen that the students were most successful in a mind map and chart strategies out of the 5 strategies, and the students were limited in applying the outline strategies. In all of the strategies, it was seen that the students were able to apply the stages of identifying keywords and creating short sentences. As a result of the research, when note-taking strategies were taught, students were successful in identifying keywords, expressing them in short sentences, and connecting information; it has been concluded that when education is not given, they tend not to take notes or to take notes on a single sentence. Based on these results, it has been suggested in line with the data obtained from the findings that note-taking strategies training should be included in the textbooks, that each strategy should be applied after texts with appropriate content, and which strategies should be applied before, during and after listening/reading.

Keywords. Cornell note-taking method, mind map, flow-based note-taking, outlines, charting, note-taking strategies.

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One of the easiest way to transfer what is heard from short-term memory to long-term memory is to include writing skills in the process. Setting four basic language skills to work together increases the effectiveness of learning and remembering. The use of note-taking habits as a writing activity while listening is an important component of the learning process. Note-taking is summarizing what one has understood in one's own words to remember it later. According to Piolat, Olive, and Kellogg (2005, p. 297) annotation of what is listened to or read is often done haphazardly and the notes taken are limited by the speaking rate of the speaker. It is often thought that those who take a lot of notes get quality notes, but this often harms learning outcomes rather than benefiting them (Friedman, 2014, p. 10). The reason for this situation is that most of the time while listening or reading, it is an effort to write down every statement in the source of the information.

Note-taking saves students from forgetting a speech or rereading an entire book. According to Hayati and Jalilifar (2009, p. 101), the reason for this is the student's desire to get good notes. The best reason to encourage note-taking is the implementation of not replaying a speech and presentation. Students enjoy taking notes because not having to look at the relevant material again while preparing for the exam by taking notes means that they can save time and reduce cognitive load. Students may enjoy taking notes because they assume it will be easy to review material to prepare for a test or exam by taking notes. (Murtafi'ah, Asmiyah and Fitriah, 2020, p. 207). Note-taking is not writing exactly what is heard or read, but writing what is understood in a personal way. Piolat, Olive, and Kellogg (2005, p. 306) stated that on the contrary, from a cognitive point of view, note-taking cannot be thought of as merely a simple, abbreviated transcription of information heard or read; states that working memory is an activity that is strongly dependent on central executive functions to simultaneously manage the processes of understanding, selection, and production. Kenneth, Kiewra and Kiewra (1987, p. 235) state that, even during note-taking, the mental activity of the note-taker for comprehension is active, and that the revised notes produce higher success than the ones that are not. Aiken, Thomas, and Shenumm (1975, p. 439) stated that note-taking can facilitate learning by causing the student to process, interpret, infer, condense, paraphrase, and provide an external memory for later use in the course content.

Students do not know what to note and they have to deal with focusing, understanding, and interpreting the content (Gilbert, 1989, as cited in Aktuğ, 2021, p. 253), students have little knowledge about taking notes and therefore they have to study their notes later It was stated that they could not use it for reading (Hayati and Jalilifar, 2009, p. 101) and that they took extremely

incomplete notes (Kiewra et al., 1995, p. 173). Additionally, another point that is emphasized on note-taking is that it should be specific to the student and that students should take notes in their own words. Yuniarti and Trisnawati (2018, p. 278) stated in their works that secondary school students could not even understand the content of the notes they borrowed from their friends. All the difficulties experienced by students in taking notes focused the researchers on the view that students should be able to use note-taking strategies. For this, teachers should teach note-taking strategies so that students can grasp keywords while listening to a text (Haswell and Lee, 2013, p. 17; Aktuğ, 2021, p. 253).

Observations from both teachers and researchers show that many students are not equipped and aware enough to take notes (Haswell and Lee, 2013; Aktuğ, 2021). Clerehan (1995 as cited in Haswell & Lee, 2013, p. 17) states that when teachers teach various note-taking strategies, they prevent students from taking notes in the same way as each other and they learn how to take notes. Note-taking is taught haphazardly or not given to students throughout their education life, but the quality of students' grades improve when a strategy or structure is shown for note-taking (Gray and Madson, 2007, p. 84). Friedman (2014, p. 10) stated that note-taking strategies have minimal effect on note-taking. Piolat, Olive, and Kellogg, (2005, p. 294) stated that note-taking strategies facilitate the process of linking ideas and ensure the long-term persistence of the content. According to the researchers, taking traditional notes does not strengthen the connections.

In the research, 7th-grade students -12- 13 years old- were trained by researchers at in Cornell, mind mapping, flow-based note-taking, outlines, and charting note-taking strategies. The reasons for the preference of the specified strategies are that they are the most preferred in the literature. (Kiewra et al., 1995, p. 173; Susanti, 2020, p. 39; Aktuğ, 2021, p. 256). The Cornell strategy encodes information as the human mind does, requiring students to select information from what they read/listen to and organize and summarize it (Murtafi'ah, Asmiyah ve Fitriah, 2020, p. 202). When the notes taken while listening are divided into sections, the effects of facilitating note-taking emerge (Aiken, Thomas and Shenumm (1975, p. 439). Cornell is a three-part note-taking strategy. The left column is for typing the keywords, the right column is for writing the important points, and the bottom is for the summary or what the student has understood. Evans and Shively (2019, p. 11) also stated that the notes section can be used to catch ideas instantly while listening, and the hints section can be used for questions that come to the mind of the student after the lesson. Mind maps are relationship maps that create creative associations between the main topic and subordinate ideas. Each branch in the mind maps provides the organization and integration of information. This also

improves critical thinking skills. Mind mapping activity has an individual format. This is also in line with the nature of note-taking, because mind maps, unlike concept maps, also allow for free association and unlimited creativity. While taking notes with the mind map, one can branch the notes according to their connections as understood (Davies, 2010, p. 281). Outlines strategy organizes information from general to specific, main and subheadings (Murtafi'ah, Asmiyah ve Fitriah, 2020, p. 208), in this strategy, students begin to write the main points on the left and supporting statements are indented from the right (Aktuğ, 2021, p. 256). Flow-based note-taking is a strategy applied to content where a process is explained step by step but the content may be complex due to the nature of the subject. What is described in this strategy is put together in connection and a flow-based note-taking is created (Routine, 2022). In the charting strategy, students divide the stories into themes and use what they listen to in each theme to write down the relevant ones. In this strategy, the information does not become a complicated situation, it becomes easier to find relevant information (Aktuğ, 2021, p. 256).

Studies reveal that students' taking notes while listening is effective in comprehending and remembering the subject (Haswell and Lee, 2013; Çakmak, 2019). For this reason, note-taking materials should be included in teaching (Boch and Piolat, 2005, p. 101). For this purpose, 7th-grade students were trained in Cornell, mind mapping, flow-based note-taking, outlines, and chart note-taking strategies. It is expected that the findings obtained from the study will contribute to the teachers who give note-taking training. With this aim, the main purpose of the study was to examine the effect of note-taking strategies training on students' note-taking skills.

In line with this main purpose, answers to the following questions were examined:

1. What are the situations/levels of middle school students using note-taking strategies?
2. What are the strengths, weaknesses, advantages, and disadvantages of note-taking strategies?

Method

Model of the Study

In the research, the case study model, one of the qualitative research methods, was preferred. According to Gall, Borg, and Gall (1996) case studies are used to describe the details that make up an event, provide possible explanations, and evaluate (as cited in Büyüköztürk et al. 2021, p. 24). Paker (2015, p. 119) describes case studies as a descriptive and specially used model in educational

sciences that examines an event in depth rather than through complex statistical analysis. In line with the purpose of the research, multiple-case, holistic multiple-case design, which is one of the case study types, was used. Robinson (2012, p. 5) indicates that different situations are analyzed and then compared in holistic multiple-case designs. At this point, before the note-taking training was given in the research, the students' views and practices on note-taking were analyzed and compared with the applications and opinions about each strategy that was given after the note-taking training.

Study Group

The study group of the research consists of 26 students in the 7th-grade of a secondary school in Istanbul. In grade selection it is seen as the criteria that note-taking strategies according to the Turkish Language Lesson Curriculum (MEB, 2019) were included in the 7th grade, writing skill achievements. Since note-taking habits are the behavior to be measured, a class with a homogeneous distribution in terms of academic achievements in Turkish lesson was chosen in order to ensure construct validity. In the selection of the school, convenience sampling, one of the purposeful sampling methods, was taken into consideration due to easy accessibility. 7 students who did not participate actively in different weeks due to absenteeism during the 6-week study were excluded from the data analysis, and the data were evaluated over 19 students who participated in each application.

Data Collection Tools

In the research, students' note papers and unstructured interview forms are formed as data collection tools.

During the 6 weeks during which the research was conducted, the students were given training on 5 different note-taking strategies (The first week was named as “zero phases” and no note-taking training was given.), then they were given time about 10 minutes to take notes accompanied by the listening texts, and after the notes were taken, the interview forms were distributed and the opinions of the students, which would provide in-depth data to the researchers in the examination of the note papers, were obtained.

The interview form was structured in a way to collect data on students' awareness and ideas with an open-ended question about what students consider worth recording while taking notes and what advice they would give about the note-taking process.

Table 1.

Sub-Problems of the Study and Data Collection Tools

Research Problems	Data Collection Tools
1. What are the situations/levels of middle school students using note-taking strategies?	Students' notes
2. What are the strengths, weaknesses, advantages and disadvantages of note-taking strategies?	Students' notes Interview forms

The listening texts used in the data collection process were chosen by the researchers who are a professor doctor, a specialist and a graduate student in the major of Turkish education, in accordance with the content of the note-taking strategy by consulting expert opinion. The reason for this is the possibility that the usability of a note-taking strategy, such as flow-based note-taking in an informative text, will cause a problem. The texts used in each strategy have been selected considering their characteristics.

The text information about the listening texts applied for 6 weeks and the note-taking strategies applied in the texts are as follows (Benzer, 2020):

Table 2.

Listening Texts Used in the Data Collection Process

Week	Strategy	Listening Text	Word Count	Length
Week 1 st	Zero Phase	Hastalıklar: Bunları Biliyor Musunuz Renk Körlüğü Nedir?	112	01.32 min
Week 2 nd	Cornell	Hastalıklar: Çocuklarda Obezite	205	02.08 min
Week 3 rd	Mind map	Bilim: Kuşlara Neden Elektrik Çarpıyor.	218	02.59 min
Week 4 th	Flow-based	Yemek: Zürafa Desenli Rulo Pasta Tarifi-Nefis Yemek Tarifleri...	253	03.14 min
Week 5 th	Outlines	Sağlık: Akciğerlerde Bulunan Üç yüz Milyon Odacık	364	03.27 min
Week 6 th	Charting	Sağlık: Ergenlik Sivilceleri ile İlgili Bilmeniz Gereken Her Şey	328	02.35 min

The role of researchers. During the 6 weeks of the research, the researchers were personally present with the 7th-grade students of a secondary school in Istanbul, which is affiliated with the MEB, where they collected data with the interview form and note papers within the scope of the

study. The researchers, who prepared and presented the training given for 6 weeks, carried out these procedures themselves, as the people who had the most command of the study, both during the training and during the pre-application question-answer. The researchers answered student's questions if they did not understand about applying the note-taking strategy or if they wanted to learn more and confirm the information they understood.

Before the application of the note papers and interview forms, without interfering with the natural process and natural results of the research, the factors that could jeopardize the validity and reliability were eliminated by answering the questions from the students one-to-one.

One of the stages of case studies is when researchers enter the research field (Büyüköztürk et al., 2021, p. 270). One of the problem sentences of the research, "What are the situations/levels of middle school students using note-taking strategies?" the answers to the question were obtained by the researchers through one-on-one contact with the research group and one-on-one observation from the field.

Research Process

Within the scope of the research, note-taking strategy training was given to the students for 6 weeks. These tutorials illustrate to students step-by-step how to use each note-taking strategy:

Week 1st

In the first week of the study, general information on note-taking was shared with the students, and no special note-taking strategy training was given. The information given in the presentation can be summarized by the titles as *the advantages of taking notes*, *the mental processes used in taking notes*, and a *example paper* and *example schema* created by the researchers. Afterward, blank papers were given to the students, and were asked to take notes while listening to the listening text that lasted 01.32 minutes Hastalıklar: Bunları Biliyor Musunuz Renk Körlüğü Nedir? After the students took notes during the listening process, the text was played a second time and the students continued to take notes during the second time listening process. Then, note papers were collected and interview forms were given.

Week 2nd

In the second week, students were introduced to Cornell, one of the most widely used note-taking strategies in schools (middle school, high school, and university) according to the literature review.

The training was given on how to use the title, keywords, and summary sections in the Cornell strategy, how to use the notes in the main notes section in a personalized way without copying pieces of information, including visual elements, and an example presentation prepared by the researchers of the study. After the training, the text of Hastalıklar: Çocuklarda Obezite, which lasted for 01.32 minutes, was played twice without break, and the students took their notes during this time. Then, the interview forms were distributed and collected at the end of the lesson.

Week 3rd

In the third week, mind map strategy training was given. For the mind map strategy, training was given first, and the strategy was tried to be embodied through sample notes. After the training, the listening text Bilim: Kuşlara Neden Elektrik Çarpıyor, which lasted for 02.59 minutes, was played twice without break and the students took their notes during this time. Note papers were collected and interview forms were given.

Week 4th

In the fourth week, the flow-based note-taking strategy was applied as it was the most similar strategy to the mind map (in week 3rd). Reminding the training of the mind map, it was stated that the strategy they learned this week can be connected with flexible connections, not with hierarchical order. The training was given by concretizing the strategy through sample flow-based notes. After the training, the listening text Yemek: Zürafa Desenli Rulo Pasta Tarifi-Nefis Yemek Tarifleri which lasted for 02.59 minutes, was listened to twice without break, while the students took their notes. After the note papers were collected, the interview form was applied.

Week 5th

In the fifth week, the outline strategy was trained, and during the training, the headings for the outlines were presented through examples. After the training, the listening text Sağlık: Akciğerlerde Bulunan Üç yüz Milyon Odacık, which lasted for 03.27 minutes, was listened to 3 times in line with the student's request. Despite this, it was observed that the students had problems with how to divide their grades into sub-headings and asked questions. Öğrenciler bu sırada notları almıştır. After the note papers were collected, the interview form was applied.

Week 6th

In the sixth week, the purpose of the chart strategy is to create a table and write the subtitles, themes, and codes to be taken from the subject at the beginning of each column and place the

information in the text in the relevant columns. First, a training was given with examples on the subject, and then the listening text Sağlık: Ergenlik Sivilceleri ile İlgili Bilmeniz Gereken Her Şey, which lasted for 02.35 minutes, was played twice without break. Students took their notes while listening. In the first listening, subheadings were determined, and in the second listening, the headings were filled into the relevant content. After the note papers were collected, the interview form was applied.

Training given for 6 weeks can be accessed by scanning the QR code.



Data analysis

From the data of the research, the students' notebooks were evaluated according to the criteria of each note-taking strategy, and the scores of the students were graphed. Although the study is qualitative research, quantitative data were used. The reason for this situation is to describe the current situation. Numbers and percentages were used instead of definitions such as "most students" or "least success". Weaver-Hightower (2021, p. 219) states that although the focus of qualitative research is not on numbers and quantity, contrary to common stereotypes, qualitative researchers should not hesitate to use these data.

During the process, students' views on note-taking strategies were subjected to content analysis. Based on the content analysis, the strengths and weaknesses, advantages and disadvantages of note-taking strategies according to the Swot analysis were revealed. Many studies reveal that SWOT analysis is effective in making strategic decisions and solving problems of institutions and organizations (Çelik and Murat, 2009; Özan et al., 2015; Urfa, Can, and Yüceol, 2021). Swot analysis is not only an analysis method for the functioning and needs of institutions or organizations but has been widely adopted in education in fields of action, especially when educating students in different disciplines (Saydumarovna, 2017, p. 383). In this study, the strengths and weaknesses, advantages and disadvantages of the relevant note-taking strategies were revealed. AlMarwani (2020) used SWOT analysis to improve the critical thinking skills of pre-service

¹ <https://drive.google.com/drive/folders/16cDDcZRbgpQeGHshMqmtYDIJGyPYA4wq?usp=sharing>

teachers through a scenario-based text, and as a result of the study, 85% of the pre-service teachers stated that SWOT analysis was effective in improving their critical thinking skills.

In the notebooks, spelling, and grammar rules, writing legibility or page layout are considered standard errors and are not considered and excluded from the review as they are not related to the special requirements of note-taking strategies.

Validity and reliability of the Study

The construct validity of a study is ensured by the non-interference of other factors with the feature to be examined. Since the aim of this study is to examine how students will reflect the content of a listening text on paper with different note-taking strategies, the listening texts were selected from authentic texts that do not include Turkish lesson topics. In this way, the construct validity of the study was ensured.

Among the data collection tools, the students' note papers, as well as the observation form, were distributed and their validity was increased by giving them several different tools (Büyüköztürk et al., 2021, p. 172). Multiple raters were used in the data collection and evaluation process.

In order to ensure the reliability of the data obtained through content analysis, the formula “Consensus / (Agreement + Disagreement) x 100” was used (Miles and Huberman, 1994, p. 64). Accordingly, the reliability rate among the researchers was found to be $P = 362 / (362 + 21) \times 100 = 94.52\%$ and the internal validity of the study was ensured.

In the evaluation of the data, the notes of the students were evaluated according to the criteria of the relevant note-taking strategies. Note papers taken using different note-taking strategies were evaluated by the researchers in the same period without any interruption, and each paper was examined by all 3 researchers at the same time. In this way, the probability of random errors in the measurement is reduced and reliability is ensured.

After the note-taking strategies training given every week, interviews were conducted with the students through an unstructured interview form. In order to ensure the content and face validity of the form, 3 expert opinions were consulted. Manipulation was prevented by asking open-ended questions to the study group.

Results

In this section, based on the sub-problems, students' individual situations regarding note-taking strategies, their success in note-taking strategies, and findings on note-taking strategies were collected.

Effectiveness of Note-Taking Strategies

The strategies in which the students got the most points for the 6 strategies after the note-taking strategies training applied are shown in Figure 1.

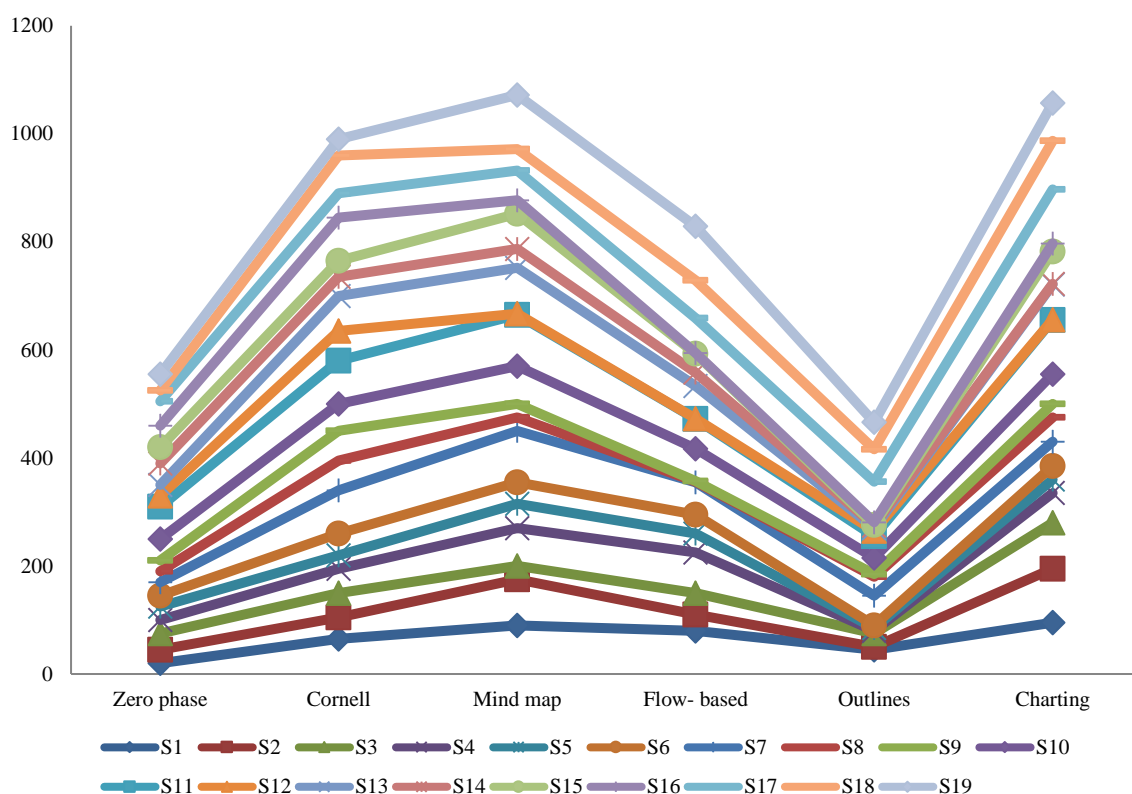


Figure 1. Effective Use of Note-Taking Strategies.

After each note-taking strategy training applied for 5 weeks, students' grades were evaluated according to the relevant note-taking strategy criteria.

The individual situations of the students regarding the note-taking strategies training applied for 6 weeks are shown in Figure 2.

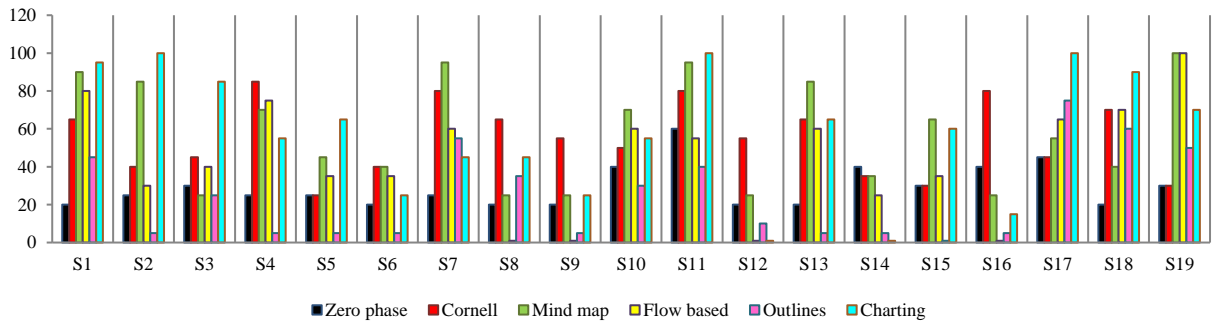


Figure 2. Availability of Each Student to Use Note-Taking Strategies.

In Figure 2, the notes taken by 19 students using the relevant note-taking strategies were examined. According to the graph, it was seen that the students got the most points (1095) from the mind map and charting strategies, followed by Cornell (1040) and flow-based note-taking (825). It was observed that the students got the lowest score (465) from the outline strategy, which was even lower than the zero phases, where no note-taking training was given.

No note-taking training was given in the first week of the research process:

-18 out of 19 students wrote only a single sentence and did not include reminder information about the content of the text.

- 5 students asked what they should take notes.

- 10 students asked whether points would be awarded based on the grades they received.

- 2 students (S10, S19) wrote a title.

When the notes of the students after the text played in the first week were examined, it was seen that the students did not take notes to remind the content of the listening text.

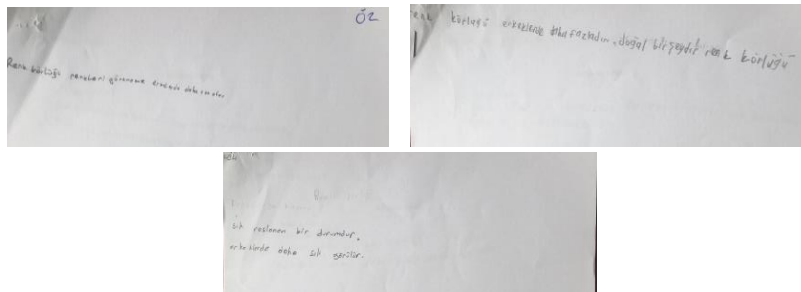


Figure 3. Notes of the Students.

In the unstructured interview forms, the students stated that they could not keep up with the notes, tried to write them exactly, distinguishing the necessary information from the unnecessary,

distinguishing between important and unimportant parts, not being able to distinguish the parts that they know and don't know, they did not know how to take notes, and they took notes on the parts that were of interest to them:

S2: Not enough time

S5: It is hard to write down the word-for-word.

S7: I took note of the ones that caught my attention.

In the Cornell note-taking strategy applied in the second week, students are required to fill in the tips, notes, and summary sections. In this strategy, it was observed that 15 students were able to use the tips, notes and summary parts as needed and applied the strategy. It was observed that 17 students took notes in short, concise, and own sentences. S11, who got the highest score in this strategy, wrote the keywords of the text in the clues section in accordance with the Cornell note-taking strategy, took notes of what was told in his/her own words, and wrote that he/she understood what he heard in the summary section. S12 with the lowest score wrote a sentence in the notes section as well, in the clues section, and it was determined that he/she only wrote any information in the text as a summary in the summary section.

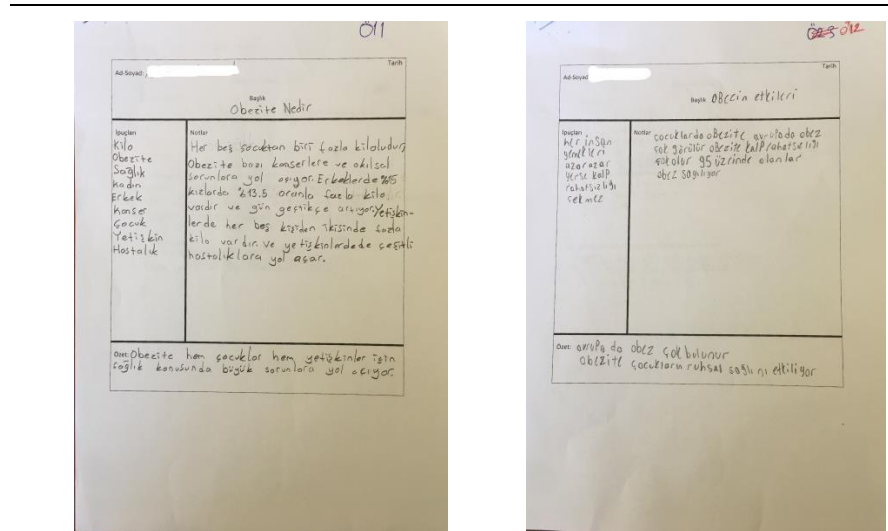


Figure 4. S11 and S12 (Cornell note-taking strategy).

In the Cornell strategy, it was observed that the students had problems in organizing the notes while listening at the same time. For example, a student who was excluded from the data analysis because he did not participate in all weeks of the study wrote the notes in order while listening and then organized his notes in accordance with the Cornell strategy.

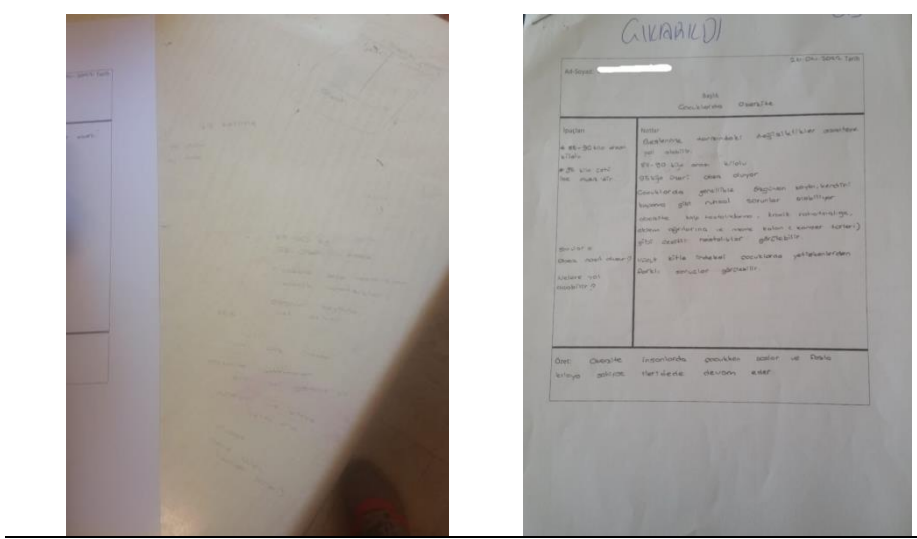


Figure 5. A Student's Implementation of the Cornell Strategy.

In the unstructured interview forms, the students stated that they took note of the words, clues and phrases that could be reminded the most in the Cornell strategy:

S11: I noted down the keywords.

S12: Itemized note-taking is always organized.

In the mind map strategy applied in the third week, the main title and features of the relevant subject should be noted as branches. It was observed that the student coded S11, who applied the mind map in this strategy, placed the main title of the subject and showed it with the branches he/she made around the relevant situations. It was observed that the student coded S12 only drew circles and noted what they listened to, and did not write the main title and the features related to the main title. S12 could not apply the mind map strategy.

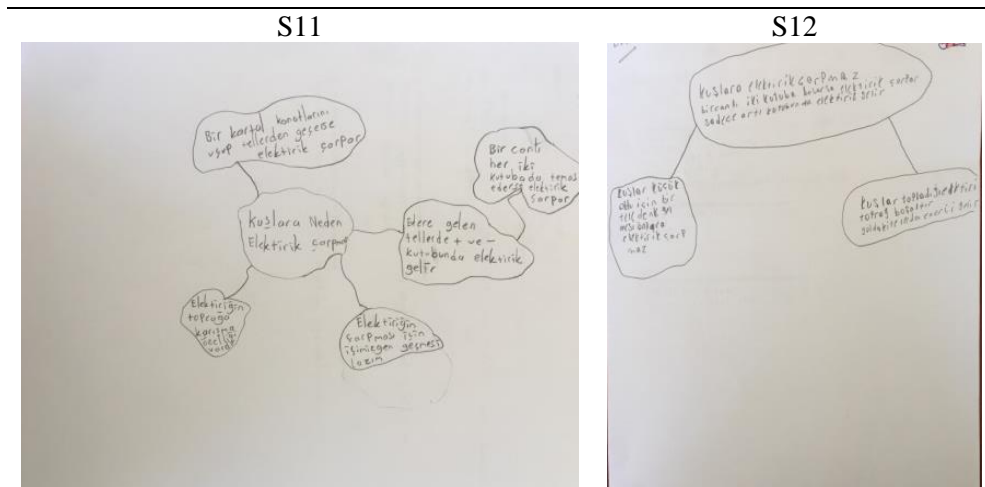


Figure 6. S11 and S12 (Mind Map Strategy).

In the unstructured interview forms, the students stated that they noted different features in circles in the mind map strategy:

S11: I wrote something different for each circle.

S12: I wrote the notes in circles.

In the appropriate flow-based note-taking strategy in the fourth week, the students are expected to arrange the lower and upper headings in a sequential manner. A student who was excluded because did not participate in all weeks of the study prepared the recipe that was played both in accordance with the recipe and without errors and embodied it by drawing shapes.

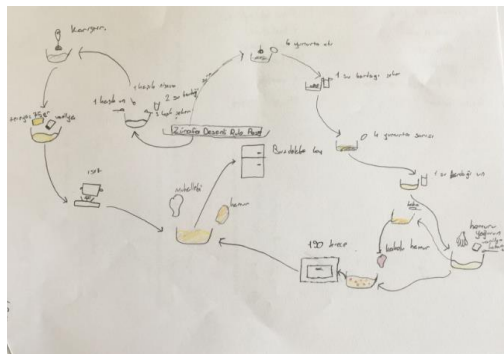


Figure 7. Flow-Based Note-Taking Strategy (A Student).

Again, a student who was excluded because did not participate in all weeks of the study, did not use the flexible connections, which is the most important feature of the flow-based note-taking strategy, and drew random branches and took notes without making connections.

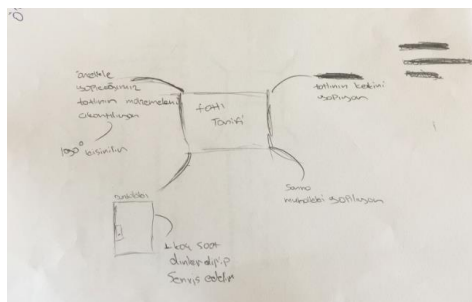


Figure 8. Flow-Based Note-Taking Strategy (Another Student).

The most suitable example for the strategy in flow-based note-taking was prepared by S11. S11 prepared the cake recipe he/she listened to gradually and in a way that connects with each other. S12, on the other hand, did not operate the strategy and wrote down the notes one under the other.

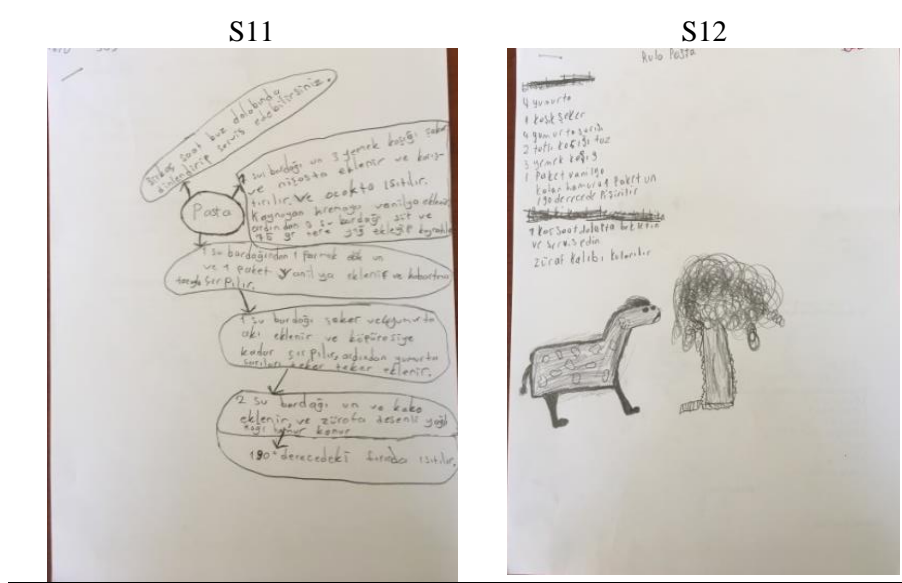


Figure 9. S11 and S12 (Flow-Based Note-Taking Strategy).

In the unstructured interview forms, the students stated that they drew pictures and took notes on the recipe in the flow-based note-taking strategy:

S7: *It is important to take note of the main words.*

S5: *I drew a picture.*

In the outline strategy applied in the fifth week, students are required to determine the main and sub-titles, go from part to whole, not to form long sentences, and include keywords and abbreviations. In this strategy;

- *The students wanted to listen to the text 3 times.*
- *8 students asked how they should take notes.*
- *It was observed that 9 students could not implement the strategy.*

According to the graph, it was seen that in the outline strategy, where the students provided the least efficiency, S11 separated the respiratory part and the atmosphere-related part of the lungs, which was explained in the video, where S11 made the indentations in accordance with the strategy. S12 is one of the 10 students who could not apply any criteria of the outline strategy. S12 has sorted the notes without using any strategy.

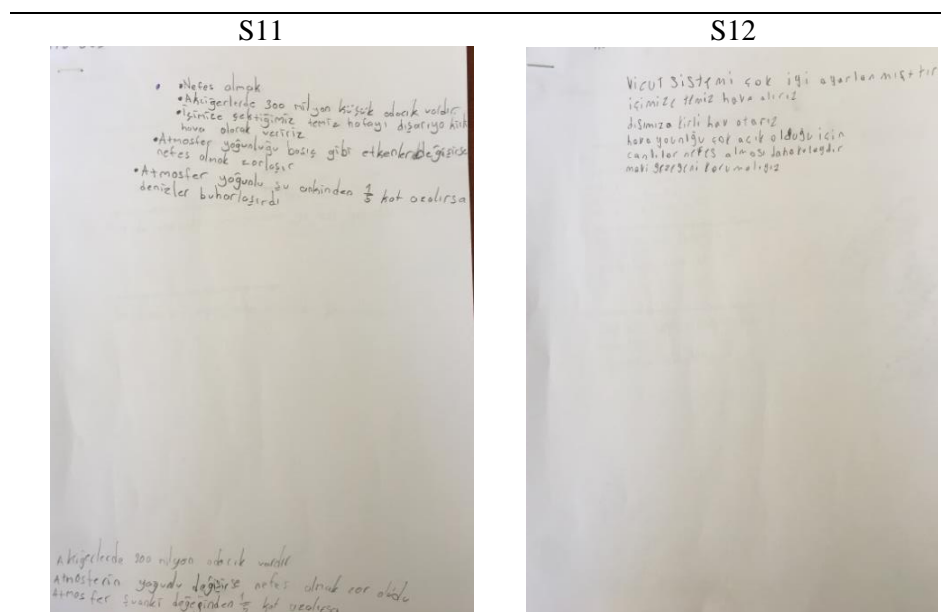


Figure 10. Strategies of S11 and S12.

In the unstructured interview forms, the students stated that they could not find the subtitles in the outline strategy and that they took their notes randomly:

S19: There is no unnecessary distinction.

S18: I couldn't detect the headers.

In the outline strategy, 13 students did not fulfill the criteria of giving the topic in a hierarchical manner and dividing it into subheadings from the specific features of the strategy. This situation caused them to not be able to implement the strategy and they could not get points from the outline notes. For example, the reason why S15 could not get points from the outline strategy is that it does not operate the strategy.

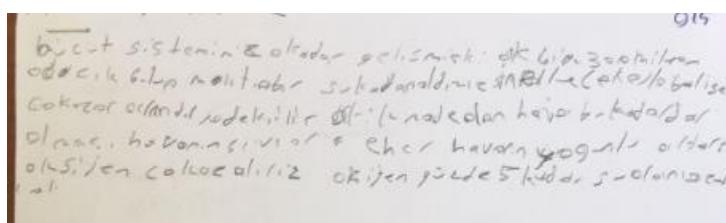


Figure 11. S15 Example of Applying the Outline Note-Taking Strategy.

S15 stated in the semi-structured interview form after the strategy that she could not write his/her notes because he/she could not find the subtitles in the video.

Since 7 students wrote a title, a feature of the outlines got points from the criterion of including the necessary expressions. For example, S4 included only necessary statements, but failed to fulfill the outline strategy's features of creating sub-headings and related items.

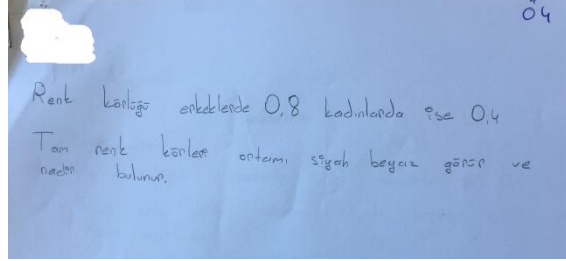


Figure 12. Q4 Example of Applying the Outline Note-Taking Strategy.

In the charting strategy applied in the sixth week, students are required to divide the topics into sub-themes and write the relevant features under the themes. In this direction, by the strategy, S11 wrote the subtitles based on the text and organized the information related to the subtitles. It is seen that in the listening text of S11 about acne, what acne is, where it occurs, treatment methods, and prevention situations are separate columns, and they are underlined. S12, on the other hand, did not use the chart strategy and wrote his/hers notes haphazardly.

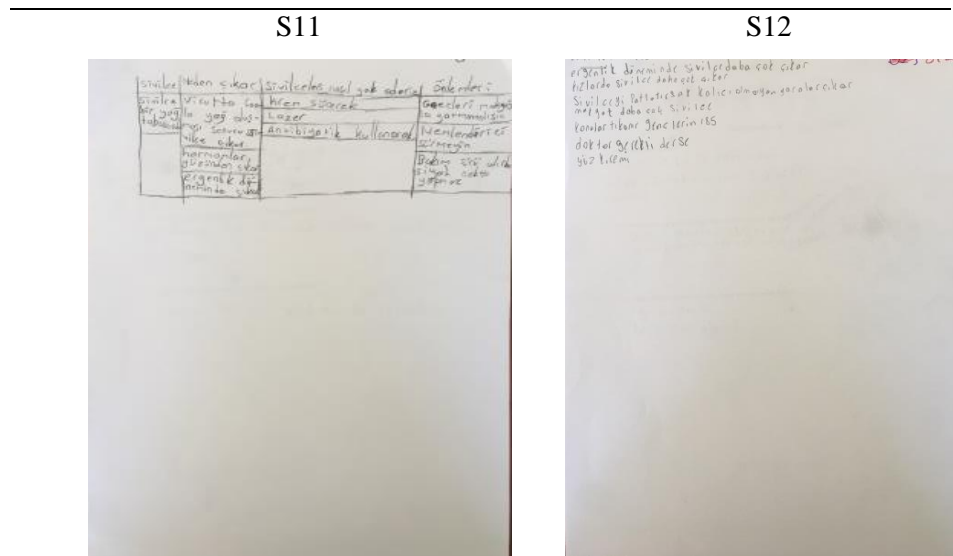


Figure 13. Strategies of S11 and S12 (After Applying Charting Strategy).

In the unstructured interview forms, the students stated that they found it positive to separate the relevant information themes and write them in different columns in the charting strategy:

S1: We can use the chart while taking notes.

S8: Extraction/classification.

3.2. Swot Analysis of Note-Taking Strategies

After each note-taking strategy was applied for 6 weeks, the written and verbal opinions of the students were taken. Based on the opinions received and the observations of the researcher, the strengths and weaknesses, advantages and disadvantages of each strategy were revealed.

Table 3.

Swot Analysis of Note-Taking Strategies

<i>Not- taking strategies</i>	<i>Strengths</i>	<i>Weaknesses</i>
1. Zero phase	Writing the unknown or striking parts. Distinguish between new and old information.	It is difficult to distinguish between necessary and unnecessary. Failure to distinguish known and unknown parts. No distinction is made between important and unimportant. Summarizing.
2. Cornell	Brief expression. Writing keywords. Writing tips. Extracting a summary.	Simultaneous note taking with listening.
3. Mind map	Writing the main information keywords. Keywords, writing frequently used words. Ability to draw pictures. Writing links.	Not indicated.
4. Flow- based	Note the main words. Ability to draw pictures.	Not indicated.
5. Outlines	Sorting information by subheadings.	Not making necessary unnecessary distinctions. Headers not detected.
6. Charting	Separation of the subject. Extraction/classification.	Not indicated.
<i>Note- taking strategies</i>	<i>Advantages</i>	<i>Disadvantages</i>
1. Zero phase	Having the right information The information is written in order.	Non-strategic, haphazard Time shortage, missing parts are not written. Writing everything. No notes taken.
2. Cornell	Writing keywords.	Concurrent organization.

3. Mind map	<p>Typing common words.</p> <p>The emergence of semantic connections.</p> <p>The most important information is in the center of the page.</p> <p>Flexible usage feature.</p>	<p>Cognitive burden.</p> <p>The obligation to organize.</p> <p>It cannot be used if the lesson is too fast.</p>
4. Flow- based	<p>Simultaneous realization of listening.</p>	<p>Inability to return to parts missed during listening.</p>
5. Outlines	<p>Filling the subheadings with keywords.</p> <p>Writing and remembering keywords instead of paragraphs.</p>	<p>Predetermination of subheadings.</p> <p>The necessity of pre-determining the sub-headings and writing the keywords under the sub-headings.</p>
6. Charting	<p>Separation of content into themes.</p> <p>Preventing complicated notes.</p>	<p>Creating a title while listening.</p>

In the study, students' views on the relevant note-taking strategy were discussed each week, and the strengths, weaknesses, advantages, and disadvantages of each strategy were revealed. The students stated that they were indecisive about taking notes because they could not distinguish between necessary and unnecessary information at the zero phases. At this stage, the students stated that they preferred not to take notes because they did not know how to take notes.

On the other hand, in the Cornell strategy, students stated that the strategy was successful in shortly taking notes, expressing keywords, and summary. Here, as the negative aspect of the strategy, S13 coded student stated that it is difficult to organize at the same time while listening. In the mind map strategy, the students' use of keywords, the possibility of drawing pictures, and the expression of connections were positive. In this strategy, the students did not report a negative opinion. Similar situations have been experienced in the flow-based note-taking strategy. In flow-based note-taking, students found it positive to note the main words. There is no negative situation related to the subject.

In the outlines strategy, the students found the feature of ordering the information positive, but they had problems distinguishing the necessary and unnecessary, and identifying the titles. In this strategy, 10 students never applied the outline strategy.

In the charting strategy, the students found the separating and classifying features to be positive, but they did not express a negative feature. The charting strategy, along with the mind map strategy, was the strategy in which the students got the highest scores.

Discussion and Conclusion

In the study, the note papers created by the students after each note-taking strategy training were evaluated according to the criteria of the relevant note-taking strategies; In line with researcher observations and student opinions, the strengths, weaknesses, advantages, and disadvantages of each strategy were revealed according to the Swot analysis. According to the research data, it was seen that the 7th-rade students were most successful in a mind map and chart strategies among the note-taking strategies, and the students were limited in applying the outline strategy.

It was observed that the students could not take notes at the zero stage, and they stated that they could not decide what to write in their opinions. At this stage, when the student's notes were examined, it was understood that 1 student did not take note of the listening text content, and 18 students only noted the listening text content with a single sentence or phrase. Kiewra et al., (1995, p. 173) stated in their studies that students who were left to their own devices recorded only 30% of the units for future reference and took extremely deficient notes. Mayer (1984, p. 34) stated that if the reader does not know how to make connections and take notes on what is told, their knowledge will not be permanent.

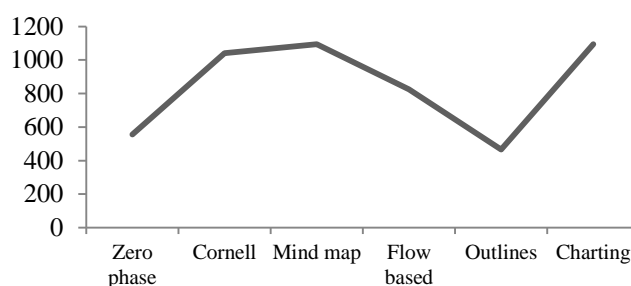


Figure 14. Note-Taking Strategies

It was observed that 11 out of 19 students fulfilled the criteria of the Cornell note-taking strategy at a rate of 54% during the transition from the zero stage, where no note-taking training was provided, to Cornell. Students stated that Cornell gave them the chance to organize information and they experienced the most convenience in identifying keywords and not having to write a full sentence. In this strategy, it was observed that 10 students could not write the summary part. Evans and Shively (2019, p. 14) also stated in their studies that students could not identify the main idea, they were distracted while taking notes, and students copied and pasted them one by one.

In the Cornell strategy, it was observed that the students first wrote their notes on a different paper or their desk, then organized and placed them on the Cornell note-taking strategy paper. In the

study of Hayati and Jalilifar (2009, p. 104) in which Cornell note-taking strategy was used on listening skills, it was found that students had difficulty in taking notes while listening simultaneously, they missed different notes while writing a point, and misunderstandings occurred.

It was observed that the mind map strategy applied in the third week fulfilled the criteria at a rate of 57%. In the mind map strategy, 14 students were able to use the strategy by reflecting on it in their notes. It was thought that this situation was due to the fact that students could take notes more effectively when they took note of mnemonic statements instead of writing their notes copying from the text in the mind map strategy. Reminder notes act as a bridge between students' minds and understanding of concepts (Lengkana, Surbakti, & Amala, 2019, p. 110). Mind maps also allow us to see students' thinking styles (Trevino, 2005, p. 31).

In flow-based note-taking, it was seen that the students fulfilled the strategy at a rate of 43%, 4 students did not apply the strategy at all, but supported their notes with pictures. The aim of flow-based note-taking is not just to list ideas, but to organize them around the page with arrows connecting them (<https://www.scotthyoung.com/>). The flow-based note-taking strategy is the third most successful strategy for students. The strategy was applied over a cake recipe as it was found appropriate to reveal a historical event step by step, the process of a job, the students showed success at the rate of 43% and the students did not give a negative opinion about the strategy in the interviews.

It was observed that students drew pictures on their notes in flow-based note-taking and mind map strategies. Taliaferro (1998 as cited in Trevino, 2005, p. 36) observed in the study on 6th-grade students that the students could not draw. The researcher attributed this situation to the fact that the students were not in the formal operational period.

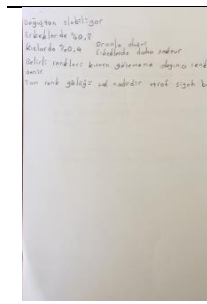
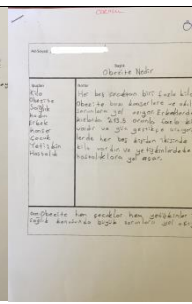
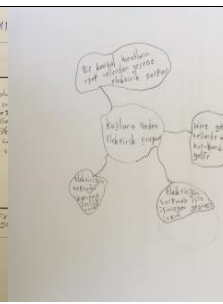
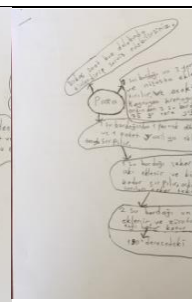
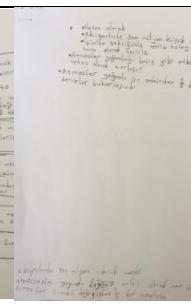
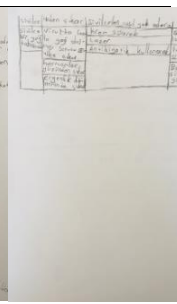
In the outline strategy, the basic criteria are for students to determine the main and sub-titles, to go from the part to the whole, not to form long sentences, and to use keywords and abbreviations. According to the graph, only S12 took notes in accordance with the outlined strategy, where the students were least productive. This strategy was even lower than in the first week when no note-taking training was given. As the reason for this situation, it was thought that the listening text named “Bu durumun nedeni olarak “Sağlık: Akciğerlerde Bulunan Üç yüz Milyon Odacık” was not suitable for dividing the content into sub-headings and sub-titles. For example, the content listened to in the mind map and charting strategies were chosen in accordance with linking and dividing them into themes. Kiewra et al., (1995, p. 175) in their study, asked their students, consisting of

language students, to take notes in the experimental group with the outlined note-taking strategy and the control group in the traditional format. In the mentioned study, it is seen that a draft for the outline strategy has been prepared and sub-headings have been determined. Trevino (2005, p. 40) stating the implementation steps for the outline strategy, stated that the draft before the strategy should be opened for discussion and that the main topics should be determined together with the students. Based on the researchers' work, it is thought that one of the reasons why the strategy applied to 7th graders was unsuccessful was the lack of implementation of the practices specified in the outlined strategy. This view is also supported by the notepaper on which S12 outlines strategy. S12 önce kâğıdını altına notları almış, sonra bunları alt başlıklarına yerleştirmiştir (see also Findings section).

It was seen that the chart strategy, together with the mind map strategy, fulfilled the criteria by 57% of the students, and the students divided the subject into intermediate themes. 2 students (S12 and S14) did not get points in this strategy, but this means that the students did not take any notes. The reason for this situation is that the students did not determine a theme and wrote their notes randomly. The most important feature of the charting note-taking strategy is its ability to naturally minimize notes. There is no need to form a complete sentence or to include transitional expressions in the charting strategy (<https://e-student.org/>). The student coded S1 also confirms this situation by saying, “Or, not by writing words like this or that, but by taking more important notes.” means he/she wrote. The grades of S11, who made the most appropriate strategy criteria in the 6-week note-taking strategies training, are as follows:

Table 4.


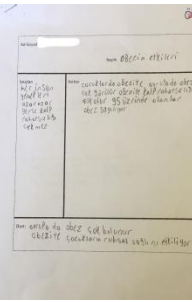




Student Notes Appropriate for Grading Strategies

Zero phase	Cornell	Mind map	Flow- based	Outlines	Charting
					

The notes of the S12 coded student who did not implement the strategy for the 6-week period are as follows:

Table 5.

Student Notes Not Conforming to Note-Taking Strategies

Zero phase	Cornell	Mind map	Flow-based	Outlines	Charting
					

In the second sub-problem of the research, SWOT analysis was performed based on the application process of note-taking strategies. The strategy of getting 5 grades, is aimed at specifying keywords, short expressions, and classifying related situations as the common feature that students constantly repeat and see as positive. In the student opinions, the students stated that they should know which variables should be addressed in a note-taking strategy. These views are the features of mind map, chart, and Cornell strategies, in which students get the highest scores. Similar results were also demonstrated in the study by Teng (2011, p. 482). In the research conducted by the researcher on foreign students, it was stated that the students mostly used the strategies of using keywords, writing with codes, and giving reminders while taking notes of what they listened to. In the Cornell strategy, it was observed that some students first took their notes on a desk or on a different paper, and then arranged them according to Cornell. This goes against the nature of note-taking strategies. While taking notes, first notes are taken, and then editing or revision is made (Kenneth, 1987, p. 243).

Recommendations

In this section, as a result of examining the students' note papers and interview forms with content and SWOT analysis, suggestions were made for each strategy that teachers can consider when applying these strategies to secondary school students.

1. In the Cornell strategy, it was not a functional practice for middle school students to fill in both the keywords and the summary while listening/reading and getting information from any source. Cornell is thought to be effective when used with middle school students after listening/reading.

2. The tendency of middle school students to write complete sentences in the mind map instead of functional notes such as incomplete expressions, phrases, and phrases has rendered making connections in the mind map and the use of space in the note paper dysfunctional. Before using this strategy, students should be reminded that it is the main goal to show the connections between concepts and that the sentences do not need to be full, regular, and long sentences.

3. Flow-based note-taking can be used in subjects such as experiment steps, or recipes, which thematically progress, and each theme has to do with each other without any sequential relationship, or where feedback needs to be made in the process steps.

4. The outline strategy should be applied in texts where the subtitles are clear enough to be identified while listening/reading. For example, it is possible to divide the life of an author into codes such as date and place of birth, education life, art life, works, and themes of his works. In the context where these codes are not clear, the subtitles should be determined together with the students.

5. The charting strategy is thought to be more effective when the relevant headings of the content are divided into columns before listening/reading and when these columns are filled during listening/reading.

6. Based on these results, it was thought that when the note-taking tutorials/educations were given, students could use note-taking strategies and these strategies should be included in the textbooks.

7. According to the information obtained within the scope of the study, which strategy can be more efficient at which stage is suggested as follows:

Table 6.

Stages of Use where Note-Taking Strategies are most efficient

Note- taking strategies	Before listening/reading	During listening/reading	After listening/reading
→ Cornell Strategy		x	x
→ Outlines Strategy		x	x
→ Mind map		x	
→ Charting Strategy	x	x	x
→ Flow- based note taking		x	

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Conflict of Interest

It has been reported by the authors that there is no conflict of interest.

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Ethics committee approval is available.

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