THE EFFECTIVENESS OF “NEURO-COGNITIVE” LEARNING STRATEGY FOR INCREASING SPEAKING PERFORMANCE: STUDY ON NON-ENGLISH DEPARTMENT STUDENTS

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ABSTRACT

English is the unifying international language of world communication. However, English-speaking countries face many problems in their position as a foreign language, so learning strategies and motivation must be emphasized in the learning process. On the other side, communication skills are the most needed skills to prepare for the world of work. Thus, this research with a qualitative method approach is focused on investigating the effectiveness of teaching and training on “Neurocognitive” based learning strategies, with continuous mentoring and injection of motivation. The instruments used are field note observations, questionnaires, interviews, and photo documentation. The subjects of this study were 14 students in the second semester of the 2020/2021 academic year of the Information Systems study program at STMIK Bina Adinata. The results showed that the students’ cognitive and non-cognitive skills were improved, especially their speaking performance. However, even though the research team carried out the procedure for providing learning strategy training under the correct stages, the results obtained were less than optimal due to online learning conditions. So it is recommended for further researchers to continue this research by thinking about learning strategies that can be combined for offline and online needs.

Keywords: English; Neurocognitive; learning strategy; speaking.

INTRODUCTION

Since it was established as a lingua franca / international language, the need to master English has become the main thing. Therefore, to participate in international communication and cooperation, English proficiency is fundamental, regardless of social, cultural, economic, educational, political, etc.

As English has influenced all aspects of life, the development of globalization is increasingly pressing the rate of increase in English users in the world. English is the official language in 75 countries, with more than two billion of the total population. However, users of English as a second/foreign language
outnumber those who speak English as a first language. Yusni (2013) reports that the ratio between users of English as a second language (L2) and native speakers is 60-75% compared to 24-40%.

This phenomenon requires quick and severe steps from the government to compete with other countries, especially for countries that adopt English as a foreign language, including Indonesia. One way to do this is to include English subjects in the curriculum at various levels of education, including the university level.

In reality, the importance of mastering English with implementation in the field does not go hand in hand because many obstacles are found. English is considered very difficult, complicated, a burden, and boring (Fahri, 2018). Especially for those who are not majoring in English but are required to take English lessons as a supporting course. As Le Nguyen (2015) reveals that the interest of students who are not majoring in English is not in line with how they see the importance of this course, which causes them to be reluctant to study English seriously. The impact of the adoption of English as a compulsory curriculum in schools was also expressed by Jin (2014), who said that most universities make English a compulsory subject, so it seems that this is only a burden for students to graduate. And as a result, most of them show low motivation and even tend to give up.

Pratiwi (2019) found that three factors that led to the unmotivated students of Bina Adinata College of Computer and Information Management (STMIK) in learning English were lack of confidence and little time for practice and lack of awareness of the students themselves. This situation is further exacerbated by the inability of lecturers to manage a supportive learning environment.

The same case was also found in 2021. An initial observation made by one of the authors while teaching in the second semester was that students showed low interest in learning English, especially at the initial meeting. In addition, their English skills are still below average. It arouses the curiosity of researchers to conduct further investigations regarding the factors that cause this condition. And as a result, the data found regarding the obstacles in achieving mastery and success in learning English in various locations are similar to the findings of several previous researchers (Yulia, 2013; Abrar, 2016; Songbatumis, 2017). It is the basis why this research is essential and urgent to do.

In learning a foreign language, especially English, many factors contribute to a learner's success. However, learning strategies and motivation are the main aspects. Non-English graduates will not be able to compete in the global world if they are not provided with an injection of motivation and appropriate English learning strategies, which they will continue to apply until they enter the world of work later. Weda et al. (2018) revealed that three of the two psychological factors that influence learners' success are motivation and learning strategies. Therefore, teachers or lecturers must rely on their ability to increase student motivation and teach various appropriate learning strategies according to the needs of their students (Bukhary & Bahanshal, 2013).
Given that speaking is the most needed skill to prepare for the world of work, this research is focused on investigating the effectiveness of motivating and using neuro-cognitive learning strategies to stimulate the speaking performance of non-English majors.

LITERATURE REVIEWS

**Motivation**

The process of motivation and learning has a significant relationship. The learning process is a continuous lifelong process. And to continue to achieve learning goals, high motivation is essential. Motivation is the force that drives students to fight against all challenging circumstances. Motivation is essential to human achievement and aspirations. Therefore, motivation is fundamental to success in life, especially in education (Gopalan, Abubakar, Zulkifli, Alwi, & Mat, 2017). Svinicki and Vogler (2012) also state that learning motivation is a process of interaction between students and the surrounding environment, characterized by selection, initiation, improvement, or persistence of goal-directed actions or behaviors. These have been variously considered individual qualities, activities, and contexts in which the individual is involved.

Gopalan, Abubakar, Zulkifli, Alwi, and Mat (2017) report that fundamentally, motivation can be categorized as intrinsic motivation, extrinsic motivation, and motivation. However, motivation is classified into several theories, especially in the educational domain, such as intrinsic and extrinsic motivation theory, self-determination theory (SDT), ARCS model, social cognitive theory, and expectancy theory. These theories can stand alone to contribute to the learning process outcomes without being dependent on each other.

Rao (2018) shares Gardner and Lambert's (1972) classification of motivation, which divides motivation into two orientations: integrative and instrumental motivation. Integrative motivation, or intrinsic motivation, is the desire to learn the language to communicate goals. These learners will try to find opportunities to converse with people from the speaking culture or identify closely with the target language group. In comparison, learners behind instrumental or extrinsic motivation will learn the language to fulfill their specific goals, usually for the short term, such as getting a scholarship, finding a job, or passing an exam.

**Learning Strategy**

Iskandar Wasid and Sunendar (2013) explain, "Learning is changing the behavior of the process to students through experience and practice because there is the interaction between individuals and their environment." Gani, Fajrina, and Hanifa (2015) then state that learning strategies can be seen as a particular way of processing information used by students to improve understanding, learning, or data storage. In addition, Mufidah (2014) states that a learning strategy is a person's approach to learning and using information. Fauziati (2015) informs that language learning strategies only refer to individual methods to complete a task.
Strategies produce a higher impact on the learning process, and specifically, according to Mistar (2011), "the use of learning strategies has a very positive effect on students' English mastery." Gani, Fajrina, and Hanifa (2015, p.18) reveal "learning strategy is one of the main factors that help determine how, and how well, students learn a foreign language." Therefore, they confirmed the success of learning English as a foreign language (Lee, 2010; Alhaisoni, 2012; Mufidah, 2014; Gani, Fajrina & Hanifa, 2015; Setiyadi & Sukirlan, 2016). According to Rubin and Thompson (1994), as quoted in Mufidah (2014), good learners can find their own independent way by taking charge of their learning, managing their language information, and creating opportunities to practice using the language. Lee further revealed, "when students start to learn something, they can respond to certain learning situations and manage their learning properly" (2010).

Learning strategies are valuable and helpful in learning English as a foreign language. Strategies resulted in a higher impact on the learning process, and precisely, according to Mistar (2011), "the use of learning strategies has a very positive effect on students' English mastery." Furthermore, Gani, Fajrina, and Hanifa (2015, p.18) reveal "learning strategy is one of the main factors that help determine how, and how well, students learn a foreign language." Therefore, they confirmed the success of learning English as a foreign language (Lee, 2010; Alhaisoni, 2012; Mufidah, 2014; Gani, Fajrina & Hanifa, 2015; Setiyadi & Sukirlan, 2016).

**Neuro-Cognitive Learning Strategies**

Cognitive strategies are general strategies discussed by previous researchers. These are activities to facilitate human thought processes, including the acquisition, storage, retrieval, understanding, and use of knowledge. Pratiwi (2021) refers to the term neuro-cognition to discuss this kind of strategy. That is because “all cognition is the result of neurological activity” (Ramachandran & Vadivu, 2014). Cognition is the acquisition of knowledge. However, knowledge acquisition is a process that involves a way of thinking. So, cognition is a product of the brain.

This Neuro-cognitive Learning Strategy is aimed at mastering communication skills which include grammar, pronunciation, and fluency. Pratiwi (2021) describes five steps to achieve speaking fluency, namely input (getting input), taking notes (taking notes), review (repeating back repeatedly), repeat/imitate (repeat by imitating sounds), and practice (practice). By doing these five steps, the purpose of communicating can be achieved, he said. Below is a chart of Neuro-cognitive learning strategies.
METHODOLOGY

Research Subjects and Design
The subjects of this study were 14 students in semester 2 of the 2020/2021 academic year, STMIK Bina Adinata, majoring in Information systems. This study was designed using qualitative methods. Qualitative methods do not emphasize the assessment of test results and the quantity dimensions and distribution of treatments. This approach focuses on investigating the effectiveness of teaching and training on “Neuro-cognitive” based learning strategies, with continuous mentoring and injection of motivation. Neuro-cognitive is one aspect of the "Centrum" learning strategy adopted from the results of Pratiwi's research (2021).
Data Collection and Analysis Methods

Qualitative data were collected through observation. Observation is the most basic method of collecting data to interact more closely with participants. Observations were recorded through the instrument in the form of field notes. Researchers also distributed a questionnaire at the end to know the effectiveness of the learning system, the application of neurocognitive learning strategies, and the level of learning progress (Cognitive and Noncognitive) based on student perceptions. The results of observation and distribution of questionnaires were strengthened by documentation in the form of photos and in-depth interviews of unique phenomena and responses.

Furthermore, the implementation of research and data collection will be carried out in a blended learning manner by implementing an online and offline system, where the research study will be planned to be carried out in the amid of covid 19. The offline method is carried out by applying the health protocol rules that have been instructed, such as the use of masks, maintaining distance and physical contact, and washing hands with a hand sanitizer.

Some steps in collecting the data, as follow

<table>
<thead>
<tr>
<th>Stages</th>
<th>Activities</th>
<th>Methods</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction, training and teaching of &quot;Neuro-cognitive&quot;- based English learning strategies consisting of five stages (input, taking note, review, repeat, practice)</td>
<td>treatment, lecturing, training, and teaching</td>
<td>3 times</td>
</tr>
<tr>
<td>2</td>
<td>Providing materials, implementing and assisting the implementation of &quot;Neuro-cognitive&quot;- based English learning strategies</td>
<td>Observation, field note, interview</td>
<td>Any time</td>
</tr>
<tr>
<td>3</td>
<td>Providing motivation continuously in mastering English material based on the &quot;Neuro-cognitive&quot; learning strategy</td>
<td>Observation, field note, interview</td>
<td>Any time</td>
</tr>
<tr>
<td>4</td>
<td>Cognitive and Noncognitive progress based on the students’ perceptions.</td>
<td>Angket, wawancara</td>
<td>Once, in the end of meeting</td>
</tr>
</tbody>
</table>

FINDING AND DISCUSSION

The research was carried out for approximately 3-4 months starting from 7 May – 30 July 2021. Data collection techniques were carried out through field note observations and questionnaire distribution. In addition, both of these instruments were strengthened by interview techniques and activity documentation in the form of photos to obtain more accurate results regarding the Effectiveness of the “Neuro-Cognitive” Learning Strategy for Improving Speaking Performance: Studies in Non-English Department Students.

Basically, the researcher formulates six chapters (“the introduction to a Computer, Parts of Computer, Internet, Multimedia (Powerpoint), Internet and website, Working Opportunities in ICT, and English for ICT”) as input/material to
be taught by applying Neuro-cognitive learning strategies. However, one chapter requires five steps to complete the cycle, starting from the getting input stage, followed by taking notes (emphasizing foreign vocabulary contained in the reading text), reviewing the material/vocabulary obtained, imitating/repeating sounds/doing pronunciation on what has been reviewed/learned), and practicing conversation as a form of vocabulary development. So, to be more effective and efficient, the research team decided to carry out two cycles with two chapters.

**Implementation of Neuro-Cognitive Learning Strategies**

To control the implementation of research by implementing appropriate neuro-cognitive strategy training steps, researchers surveyed students by giving several questions which students answered with a firm answer of "yes" or "no" according to the reality they felt.

From the student responses, data were obtained where all questions were answered "yes" by all respondents. It indicates that the research team has carried out a suitable procedure for providing material based on neuro-cognitive learning strategies.

The student responses (Indonesian language) are presented in the following table:

<table>
<thead>
<tr>
<th>No</th>
<th>Pertanyaan</th>
<th>Jumlah Responden (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Apakah dosen memulai materi dengan memberikan input materi seperti reading text?</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Apakah dosen menginstruksikan mahasiswa untuk membaca silent diikuti membaca nyaring secara bergilir?</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Apakah dosen memberikan penekanan/ berfokus (mencatat/ menebalkan kata, melafalkan, dan membahas arti) setiap kata-kata asing yang terdapat pada materi sesuai dengan jurusan kalian?</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Apakah dosen menginstruksikan untuk mengulang (review) dan meniru (repeat) untuk kata kata asing atau kata kata penting yang ditemukan dalam teks?</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>Apakah dosen membuka peluang untuk mempraktekkan kecakapan berbahasa Inggris anda?</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>Apakah materi/ topik yang diberikan oleh dosen sesuai dengan kebutuhan dan ketertarikan anda?</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
<td>Apakah dosen memberikan kalimat motivasi, dukungan, dan semangat saat proses pembelajaran Bahasa Inggris berlangsung?</td>
<td>100</td>
</tr>
<tr>
<td>8</td>
<td>Apakah dosen memberikan komentar, tanggapan, dan koreksi terhadap hasil kerja anda dengan tujuan untuk memperbaiki kesalahan?</td>
<td>100</td>
</tr>
</tbody>
</table>
In receiving an explanation regarding the research objectives, there is also an injection of motivation for the importance of learning English, as well as training and understanding related to the application of appropriate learning strategies, one of which is using neurocognitive learning strategies. www.cancer.gov explains that neurocognitive means requiring someone to do something with the ability to think and reason. The abilities in question include concentrating, remembering things, processing information, learning, speaking, and understanding (Pratiwi, 2021). Therefore, "naturally, the learning process depends on the brain functioning effectively" (Sasikumar, Fathima, & Mohan, 2013). From this explanation, of course, this becomes a big hope for students to get better English learning than before.

In neurocognitive strategies, several inputs can be given to students. However, in this study, the input presented is in the form of reading material (reading text), packaged with various activities to support the final result, namely speaking/communication skills. At this stage, students are instructed to do the silent reading three times and read loudly by drilling/alternating. The purpose of doing silent reading is to absorb all the contents of reading related to computers. Furthermore, reading aloud is intended to train students' pronunciation and speaking skills because a phenomenon that often occurs reveals that students who actually only have limited time to learn English in class only focus on improving grammar understanding which is not supported by the active involvement of students in expressing opinions and communicating. (Yulia, 2013; Abrar, 2016; Songbatumis, 2017).

The unique thing in providing material based on neurocognitive learning strategies is that each chapter of the text reading that is presented is equipped with an emphasis in bold print on computer vocabulary that is considered difficult and rarely used, making it easier for students to focus on finding meaning and practicing their pronunciation. Of course, this activity is accompanied by assistance from the research team and all those involved in the research. Many strategies are taught to students at this stage of taking notes and reviewing. Among them is recording vocabulary in a small notebook or maybe with rather large writing and then pasting it on the wall. These notes are not just repeated, but students can review them by looking for synonyms/antonyms/word definitions/making sentences, etc., so that the vocabulary will be recorded and stored in memory longer.

To improve speaking skills and fluency, students are stimulated to practice speaking in pairs with friends as a partner to speak. These two stages are the last step of the neurocognitive learning strategy, namely, imitating and practicing. The material used as material for the conversation is several questions that appear under the reading text presented. The students answered these questions in pairs. They were allowed to discuss and then practice it with their classmates.

In the early stages of the trial, the students looked enthusiastic about the learning methods applied. However, some students look shy to speak and are still less active in class. Therefore, the team of researchers, experts, inventors, and
developers of this neuro-cognitive learning strategy constantly motivates and explains the suitable learning method.

Based on observations in the second cycle, significant progress was seen in the cognitive and non-cognitive skills of the students, especially in speaking skills, compared to the cycle/series of the early-stage research. In addition, students seemed more motivated, excited and showed better self-confidence than before, even though some students still made mistakes in pronunciation. In fact, apart from improving speaking skills, students are also indirectly trained to increase their confidence in speaking English in public.

**The Cognitive and Non-cognitive Learning Progress based on Students' Perception.**

After controlling for the implementation of the research by applying the appropriate neuro-cognitive strategy training steps, statements were distributed to determine the effectiveness of the research implementation on cognitive and non-cognitive learning progress, especially in the speaking performance of these non-English students based on their perceptions.

The survey results show that no students feel "very not improved" while learning English this semester. However, one student said that listening/listening skills "did not improve," as well as writing skills. Neuro-cognitive strategy is a learning strategy that includes several activities to support the improvement of speaking skills. However, that doesn't mean putting aside other skills. Instead, various activities related to reading, listening, and writing skills are combined with supporting the final result, namely speaking/communicating performance with more confidence in public/foreigners.

From the data obtained, although there are students who feel "very much improved" on the seven statements given, the number is still minimal, where one respondent answers each item. Most students are in the perception of "increasing" and "quite increased."

Following are the results of the questionnaire survey obtained from the distribution of google forms.

**Table 2 The Cognitive and Non-cognitive Learning Progress based on Students' Perception.**

<table>
<thead>
<tr>
<th>No</th>
<th>Pernyataan</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wawasan bahasa Inggris saya terkait jurusan/bidang studi saya meningkat</td>
<td>7.1</td>
<td>42</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Keterampilan berkomunikasi dalam bahasa Inggris saya meningkat</td>
<td>7.1</td>
<td>0</td>
<td>92.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Keterampilan membaca teks bahasa Inggris saya meningkat</td>
<td>7.1</td>
<td>0</td>
<td>78.6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Keterampilan menyimak Bahasa Inggris saya meningkat</td>
<td>0</td>
<td>14.3</td>
<td>78.6</td>
<td>7.1</td>
<td>0</td>
</tr>
</tbody>
</table>
In the "increased" perception option, most students felt the increase experienced in their knowledge of English related to the field of study, followed by their increased motivation and interest. This is because the reading text presented along with the supporting material in each chapter contains content about their field of study (computers). Therefore, indirectly, although studying English, students also study computer science. Interviews continued with students who experienced increased motivation and interest in learning English. The interview extract is presented below:

P  : Mengapa anda merasa mengalami peningkatan pada motivasi dan ketertarikan belajar bahasa Inggris?
R4  : Karena cara mengajarnya jauh lebih baik di semester ini.
R13: Karena materinya berhubungan dengan komputer, beda dengan semester sebelumnya yang kita hanya diajarkan grammar. Adanya pelatihan strategi belajar ini juga keren, kita menemukan banyak ide yang belum pernah kita pikirkan sebelumnya.

(Interview with R1&R13, 30 July 2021)

In the perception option "quite increased," 92% or 13 students said that their response experienced a significant increase, especially in speaking skills, compared to other skills. When explored more deeply, they said that the application of this neurocognitive learning strategy was excellent because it contained various techniques to improve speaking skills that students had never thought of before. However, the limitations and brief research time, coupled with online and offline blended conditions, made the achievements of this research not very optimal (Results of interviews with R1 and R5, 30 July 2021).

CONCLUSION

English language skills are the biggest asset of students in the era of globalization. In learning this foreign language, many factors contribute to the success of a learner. However, learning strategies and motivation are the main aspects.

The learning strategy to be applied in this study is neuro-cognitive, which includes receiving material (getting input) of reading text followed by silent reading, reading aloud, and taking notes on foreign vocabulary, reviewing, repeating/imitating, and practicing conversation (practicing conversation). The results showed that students gained an increase in cognitive and non-cognitive skills, especially in speaking performance. However, even though the
Researchers carried out the procedures for providing learning strategy training under the correct stages, the results obtained were less than optimal due to online learning conditions. Therefore, several solutions were obtained, such as developing a neurocognitive learning model to be a moticom- neurocognitive model. In addition, the material is distributed on a website that is specifically designed to support the current digitalization system. Thus, students can be more motivated and can easily access the material.

**The Reality of Research and Teaching Conditions during the Covid-19 Pandemic**

It is undeniable that the Covid-19 pandemic condition is also one factor that is not optimal in higher education's tri dharma activities, including teaching and research. The research, which was initially planned to be conducted offline, had to be carried out using blended learning. We feel this obstacle as research lecturers and students, especially those who are respondents. They admit that online learning is not effective for them because the biggest obstacle is internet connectivity. Many students are forced to return home because there are no lecture activities at their universities. As a result, the signal is difficult to reach for some remote areas, where most students live in remote areas.

In the learning process, they prefer to use smartphones because this media is more flexible, small in size, easy to carry everywhere and easier to catch signals, especially those in the area compared to laptops that have to be connected through the HP network.

**REFERENCES**


