SCAFFOLDING ELEMENTARY STUDENTS' WRITTEN COMPOSITION WITH TECHNOLOGY TO IMPROVE THE QUALITY OF THEIR WRITING

By

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DECLARATION OF ORIGINALITY

I, Gülcan Biçer Özdemir, certify that

• I am the sole author of this thesis and that I have fully acknowledged and documented in my thesis all sources of ideas and words, including digital resources, which have been produced or published by another person or institution;

• this thesis contains no material that has been submitted or accepted for a degree or diploma in any other educational institution;

• this is a true copy of the thesis approved by my advisor and thesis committee at Boğaziçi University, including final revisions required by them.

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ABSTRACT

Scaffolding Elementary Students' Written Composition with Technology to Improve the Quality of Their Writing

The purpose of this study is to account for the expeditious decision process novice writers engage in when deciding what to write and how to write it. In this study, explanations of cognitive processes for composing a written text are used, particularly knowledge-telling. Additionally, Recognition Heuristics are tested as a descriptive model to explain their decision-making. Investigating novice writers' default decision-making strategies, it is proposed that novice writers use heuristic decision-making strategies in composition writing through the use of cognitive processes. In this respect, the study employed a protocol that consisted of a recognition task and a preference task. The participants were fourth-grade primary school students (n = 217) at a state school in Istanbul. The students were given 100 items to label as "Recognized," "Slightly Recognized," or "Unrecognized" in the recognition task, and in the preference task, they were shown writing pairs based on their choices in the recognition task. The results showed that writing instructions using recognized and slightly recognized items were chosen at a rate of 65.9% by the participants over unrecognized items. The analysis also revealed that when recognition is the only cue for discriminating, it takes less time to select recognized things. The most plausible reason for this result is that the participant relies on and employs RH in making a decision.

ÖZET

Kompozisyon Yazımı Niteliğini Artırmaya Yönelik Acemi Yazarların Yazma Süreçlerinin Desteklemesi

Bu çalışmanın amacı, acemi yazarların ne yazacaklarına ve nasıl yazacaklarına karar verirken giriştikleri hızlı karar sürecini açıklamaktır. Bu çalışmada, yazılı bir metin oluşturmaya yönelik bilişsel süreçlerin açıklamaları -özellikle Bildiğini Anlat (Knowledge Telling)- kullanılmıştır. Ek olarak, Tanıma Sezgileri (Recognition Heuristics), acemi yazarların karar vermelerini açıklamak için tanımlayıcı bir model olarak test edilmiştir. Varsayılan karar verme stratejileri araştırılırken, acemi yazarların kompozisyon yazarken bilişsel süreçleri kullanarak sezgisel karar verme stratejilerini kullandıkları ortaya konulmuştur. Bu bağlamda araştırmada tanıma görevi (recognition task) ve tercih görevinden (preference task) oluşan bir protokol kullanılmıştır. Katılımcılar İstanbul'da bir devlet okulunda ilkokul dördüncü sınıf öğrencileridir (n = 217). Öğrencilere tanıma görevinde "Tanındı", "Biraz Tanındı" veya "Tanınmadı" olarak etiketlemeleri için 100 madde verilmiş ve tercih görevinde tanıma görevindeki seçimlerine bağlı olarak ikili kompozisyon konuları gösterilmiştir. Sonuçlar, katılımcıların tanınan ve az tanınan maddelerden oluşan yazma yönergelerini, tanınmayan maddelere göre %65,9 oranında seçtiğini göstermiştir. Analiz ayrıca, ayırt etme için tek ipucu tanıma olduğunda, tanınan şeyleri seçmenin daha az zaman aldığını ortaya çıkarmıştır. Bu sonucun en makul nedeni, katılımcının karar verirken Tanıma Sezgilerine güvenmesi ve onu kullanmasıdır.

To YBB,

For all those special moments...

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CHAPTER 1

INTRODUCTION

‘We know more than we can tell.’

Michael Polanyi

1. Introduction

This chapter provides a general framework for the study. It gives a brief overview of the study’s background, a statement of the problem as well as the significance of the study. In this chapter, the purpose and organization of the study, as well as the research questions, are discussed.

1.1 Background of the study

Writing came a long way since its emergence five and a half thousand years ago in Mesopotamia as simple marks on the surface representing letters and evolved into a complex productive skill demanding both the integration and application of various sub-skills (Byrne, 1991). It may look like a natural extension of learning to speak. However, it is not (Raimes, 1983), for writing calls for several cognitive, metacognitive and linguistic processes to be intentionally applied (Hidi and Boscolo, 2006). Be it first or second language learners, the extensive employment of complex processes makes it hard for all and triggers anxiety and frustration. Many refrain from writing and may bear the ill-feeling that they are incapable of writing (Brown, 2001; Rijlaarsdam and van den Bergh, 2004).

Composing written text was generally studied under rhetoric until Hayes and Flower (1980; Flower & Hayes, 1981) suggested that composing a written text

employs various cognitive processes in tandem. Hayes and Flower's (1980) model explained the cognitive resources involved in producing a written composition along with their functions. According to Hayes and Flower's model, the writer not only organizes but also manages the necessary thinking processes.

Regarding the needs of the students with the intention of helping them achieve their learning goals (Sawyer, 2006), learners seem to benefit from various scaffolds that support cognitively demanding thought processes involved in learning, such as resource-intensive situations, higher-order thinking processes involved in problem-solving and knowledge construction (Elliott, 2002).

Therefore, scaffolding becomes more of an issue in driving learners to knowledge transforming, rather than simply knowledge telling. Scardamalia & Bereiter (1987) proposed an influential cognitive theory of the writing process, which consists of two models: the knowledge-telling model and the knowledge-transforming model. Novice writers are highly inclined to knowledge telling which is described in terms of "psychology of the natural" (Bereiter & Scardamalia, 1987, p. 5). Knowledge telling utilizes natural human endowments of language competence and skills learned through simple social experience, reducing the amount of novel issues that must be handled (Bereiter & Scardamalia, 1987). Knowledge transforming, on the other hand, may be defined within a "psychology of the problematic" (Bereiter & Scardamalia, 1987, p. 5); involving going beyond simple linguistic endowments in order to enable the individual to achieve alone what is normally achieved only through social interaction. Writers who employ this method are active not only in the processing of text (the knowledge-telling process), but also in the processing of knowledge: they reevaluate what they want to write by

constantly evaluating what they are writing (Bereiter & Scardamalia, 1987; Woodall, 2000).

The term heuristic dates back to ancient Greek, meaning "serving to find out or discover" (Gigerenzer, 2004, p. 62). It is used as useful intuitive shortcuts or rule of thumb for guiding search (Gigerenzer et al., 1999). While making many judgments in everyday life with a limited time, sources (Maeyer & Talanque, 2010), and cognitive capacity (Marewski et al, 2010), people are inclined to rely on their knowledge that will give them the most reasonable result (Gigerenzer & Selten, 2001; Marewski et al., 2010). Heuristics are used when people cannot find an optimal best solution to problems, or when finding an optimal strategy is costly and slow (Gigerenzer, 2006).

Unlike expert writers, novice writers start composing in a very short period of time. Experts, on the other hand, need time for planning before they begin writing. Therefore, in this study, it is hypothesized that when choosing a writing topic and scanning the memory for directional cues, novice writers tend to make decisions based on heuristics.

The starting point of this study is to support novice writers' progress in composition writing through the use of decision-making strategies, using cognitive processes explanation of composing written text, especially the knowledge telling Bereiter & Scardamalia (1987) proposed. The purpose is to account for the expeditious decision process novice writers engage when deciding what to write and how to write it. It is proposed that novice writers are using heuristic decision making strategies and test Recognition Heuristics as a descriptive model to explain their decision making.

1.2 Statement of the problem

Composing a written text as a complex cognitive activity could undoubtedly use some support, especially for novices who seem to struggle to produce quality written text. Novice writers solve a different problem than experts to serve their communicative needs. They oversimplify their task and produce a written text that reports their relevant thoughts.

Numerous studies have shown that writing is one of the most demanding skills to become proficient in due to its complexity, including syntax, lexis, content, organization, and punctuation, usually resulting in the frustration of learners (Byrne, 1991; Rijlaarsdam and van den Bergh, 2004; Chuy et al., 2011; Brown, 2001; Richards, 1995). At this juncture, technology might provide a tool/digital task environment that might be utilized in the process of written text. Scaffolding students' writing in the framework of heuristics is unclear; therefore, further research is needed to deeply understand the process of improvement in students' writing. In this respect, this study will contribute to the literature for the following reasons. Firstly, there is a considerable gap in the literature about how writing is developed and how this development is evaluated. The literature focuses primarily on writing as a product; however, writing as a process is not prioritized. Therefore, there is a need to understand how students develop their sense and skills of writing through scaffolding.

Second, studies generally deal with writing decisions on a descriptive level, discussing what decisions writers make while only a few explain how they make those decisions. Novice writers wondrously begin producing a written text in a short time and finish when there are no more thoughts to report. There is a growing need

for an in-depth understanding of how students improve their writing and what their preferences are.

Finally, most writing research has been conducted without an alignment of a technological tool or a digital environment. As a result of the education system in our country, most of the learners are not experts in productive skills. At this point, technology might be utilized by the suggestive prompts which are embedded in the software. Therefore, there is a need for research into better writing through a tool that employs heuristics.

1.3 Significance of the study

The underlying theories of this research, which focuses on the decision making strategies of learners in writing, are knowledge telling, knowledge transforming, and heuristics. This study will inform teachers about how elementary school students make decisions in terms of their choice of writing topics and and what factors to consider during the writing process. In addition, this study is expected to inform researchers on the choice of writing topics in alignment with the technological tools that help educators keep up with the current technology.

1.4 Purpose of the study

In this study, Knowledge telling and knowledge transforming models, which were proposed by Scardamalia and Bereiter (2006), and heuristics are the core frameworks. The purpose of this study is to understand and examine the decision-making strategies of primary school students in order to help them write better. Additionally, the study aims to find out the effects of technology integration in

elementary school students' writing, based on a heuristics framework, in a real context.

1.5 Research questions

The following research questions are posed in order to achieve the goal of this study:

Q1. The question independent of the participants

When given two sentences to choose from, what is the rate of selection for sentences expected to be selected?

Q2. Participant dependent question

When given two sentences to choose from, what is the difference between each participant's average response time for expected selection than the response time for the other selection?

1.6 Research hypotheses

H1. Recognized identifiers will be selected more than unrecognized identifiers in the recognition task.

H2. The response time of the topic sentences that include the recognized identifiers will be faster than the topic sentences that include unrecognized identifiers.

1.7 Organization of the study

In chapter 2, writing theories and heuristics are covered in the literature review. Chapter 3 introduces the research design, the context and participants, the data collection process and instruments, and the data analysis procedure. Chapter 4 contains analysis' results. In Chapter 5, the discussion of the findings, the limitations of the study, and recommendations for future research are introduced.

CHAPTER 2

THEORETICAL FRAMEWORK

In this chapter, I set the theoretical ground for the analysis of the role of heuristics in the process of writing in the pursuit of answering the question of how novices make their writing decisions. To achieve this, I review the existing literature from a critical perspective. The review of the literature might be analysed in different sections. In the first section, I focus on writing as a challenge to demonstrate why this study specifically pays attention to novices and their writing journeys and writing as a process to show the gaps in the approaches that define writing as a product. In this section, I argue that writing needs to be seen and analysed as a process to not only demonstrate why it is important to understand the novices' experiences including acquirement and knowledge telling in and through writing but also to lay the foundation for analysing how novices deal with these challenges.

Secondly, I go deeper into the process-based approaches with a specific focus on theories of the cognitive process. Analysing the two most influential models of the cognitive process approach, I argue that while cognitive models recognize the importance of considering and analysing writing as a process, they fall short of either providing necessary tools and understanding the distinctions between expert and novice writers or providing satisfactory explanations on novice writers' methods of overcoming challenges of writing, especially in the face of uncertainties.

Lastly, I focus on heuristics which appears to be the most enlightening theory for the purposes of this research thanks to its effectiveness in making accurate and simple decisions for non-experts who lack sufficient resources, especially under

uncertainty. The critiques of heuristics are also provided for a more comprehensive account of the theory and to show its suitability for this thesis.

2.1 Writing as a challenge

In order to answer the question of why heuristics are important in writing, it is important to understand what writing is about and what makes it challenging for writers. Writing has always been a journey from one's inner world to other people's minds as a distinctive medium of communication. Writing is a productive skill consisting of a series of rules and systematic instructions rather than simply producing graphic symbols. Additionally, it is frequently referred to as a complex process that involves the interaction of both cognitive and physical factors and assists in encoding a message using a visual medium (Byrne, 1991).

It is commonly stated that writing is a complex and lengthy task (Rijlaarsdam and van den Bergh, 2004; Chuy et al., 2011), giving rise to anxiety and frustration in many learners (Brown, 2001; Richards, 1995) and resulting in the loss for ideas (Byrne, 1991).

According to the existing literature, the difficulty in writing might result from several reasons such as the need for a good command of language (Weigle, 2009), the difficulties in producing something (Brown, 2001) and it's being a skill that needs to go through instruction over time (Richards 1995). Additionally, there are other factors that make writing a challenging activity. Among others, the fact that a written text has to be accurate in terms of grammar, spelling, and punctuation (Berninger & Amtmann, 2003; Byrne, 1991; Harmer, 2004), without utilizing body language, gestures, volume, and intonation (Brown & Yule, 1989; Byrne, 1991) is a significant reason. The written text has to be clear for the audience in conveying the

message since it lacks immediate feedback (Byrne, 1991; Hyland 2002; Richards, 1995), which is yet another factor lying behind the difficulty of writing.

Writing in one's first language (L1) is a challenging task that demands a variety of linguistic talents (Schoonen et al., 2003). Writing is a hierarchical array of abilities that are learnt and accessed consciously and systematically in a three-step sequence of prewriting, writing, and rewriting; knowledge connected to L1 writing implies knowing independent skills that are used context-invariantly in the production of any text (Edelsky, 1982). Words and grammatical structures may be easily available in an automated manner while writing in L1, just as they are when speaking. As a result, at greater levels of language competence, the speed of lexical and grammatical retrieval may be similar among writers (Schoonen et al., 2003).

Long-term memory retrieval is likely to be related to the topic in L1 writing. Ideas, which are derived from previously acquired information and personal experiences that are closely linked to the issue, may be stored in long-term memory as language, or they may be stored as concepts and kinetic images that have not yet been articulated in words. Moreover, if the writer is familiar with the topic, the writer generates more ideas than if the topic is unfamiliar to the writer. (Stapa & Majid, 2009).

2.1.1 Novice writers

As this thesis argues, writing is a tough activity for many individuals. It is also important to analyse and examine writing in the context of writers, the ones who create the writing. From a perspective that considers the role of writers in shaping the writing process, the fact that writing itself has its own challenges even for expert writers, becomes more complicated when it comes to novices of the writing world

(Graham, 2006). Their writing abilities are usually insufficient to fulfill the expectations of the classroom (Persky, Daane, & Jin, 2003).

According to research comparing expert and novice writers, novices spend less time planning, without taking into account extra restrictions such as organization, structure, and target audience. (Bryson et al., 1991; Kellogg, 1994). Novice writers frequently work backwards from the objective to discover subgoals that will help them approach a solution, proceeding directly toward their goal. Experts, on the other hand, use a more competent forward-acting procedure to reach their goals (Bryson et al., 1991).

Expert writers spend considerably more time than novice writers in terms of developing major themes when writing (Bereiter, Burtis, and Scardamalia, 1988; Sasaki, 2000). Their focus on having a significant impact on the topic assignment, indicates that moving beyond the given situation requires a lot of mental energy. Novice writers, on the contrary, start to produce their key points in half a minute or less and spend the remainder of their time writing on specific content (Bryson et al., 1991). Novice writers' thinking-aloud procedures indicate little or no planning effort (Burtis et al., 1983).

From a similar perspective, the research which was conducted by the U.S. National Assessment of Educational Progress in 2007 shows that only 33% of 8th-grade students were assessed as expert writers (Schneider, 2008). Most of the students are below the basic achievement level and they do not have the essential knowledge or skills that are required for a complete work (Chuy et al., 2011). As shown, students are among the main subjects of novice writing examinations. Furthermore, taking students as the main subjects of novice writing provides an important approach as well as an instrument to gain a deeper understanding of the

natural foundations and the most basic dynamics of writing. This is also the reason why this thesis focuses on students' writing experiences to analyse the role of heuristics in writing.

Although, in the literature, there are various studies on writing and the ways how writing as an activity is realized by different actors with varying levels of knowledge and skills, some of the studies lose sight of important approaches which shed light on writing in general and writing challenge for novices in particular. In the next part, different approaches will be examined in detail and the gaps in their theories and methodologies will be presented with a critical perspective.

2.1.2 Writing as a product vs. writing as a process

In order to understand the novice writers' writing journeys, how they deal with the writing challenge, and the role of heuristics in this journey, it is vital to understand what writing really is and how it should be evaluated. In the existing literature, there are mainly two approaches: those who see writing as a product and those who see writing as a process.

As the existing studies demonstrate, these approaches to writing are highly related to the historical evolution of the 'writing paradigm' itself, which deserves a special mention as each era represents different understandings about the nature of writing. Until the 1960s, the writing approach was based on nineteenth-century rhetorical categories in which writing is considered as a product rather than a process itself (Andrews & Smith, 2011). Despite its early-time merits, this approach lost ground in the following years as it tended to examine writing as an accumulation of sentences that were brought together, undermining the journey of writing itself including but not limited to the issues such as how and through which ways these

sentences came together. These shortcomings of the product-based approach to writing are mirrored in the unanswered question of how and as a result of which decisions novices write.

Although the recognition of speech and writing as complex independent phenomena from the 1960s to the 1980s appeared promising (Andrews & Smith, 2011) in terms of exploring the writing journey itself and understanding the writers, most importantly, novices' experiences with writing, these efforts failed to address the writing itself as a phenomenon, which left the questions regarding the writing journey itself as a big gap in the theory as well as in the practice.

It was with the 1980s that writing started to be seen and studied as a process. To detail, from the 1980s to the 2000s, cognitive psychology gained focus. The idea of teaching writing shifted from the product-oriented to the process-based approach (Hayes & Flower,1980; Frans, H. J. G., 2010; Palpanadan et al., 2014) involving systematically written texts rather than simple sentence-level forms (Emig, 1971). Additionally, during this period, the core point was based on knowledge telling and knowledge transformation models for novice and expert writers, drawing attention to the planning, generating, and reviewing stages of writing (Bereiter & Scardamalia, 1987). From the 1990s to the present, the socio-cultural aspects of writing gained importance. Writing as a cognitive process altered its way to the municipality of voices rather than personal voice, along with the innovations granted by mobile phones and the internet (Andrews & Smith, 2011).

The response provided by the process-based approach has been solid and the contribution to the literature has been useful as this approach has opened the path for discussions on the role of knowledge in writing. It has also helped researchers focus on the actors who make the writing possible, which in turn, paved the way for

questions to be produced about novices and their writing experiences. Besides, the latest forms of process-based perspectives have made it possible to further analyse the learning and teaching of writing while providing researchers with opportunities to question decision-making and other processes occurring behind the scenes of writing.

This thesis approaches writing as a process rather than a product to answer the question of how primary school students make writing decisions and what role heuristics play in this process. Using this understanding, the thesis also emphasizes the significance of learning and teaching writing to novices.

2.2 Writing theories

Although the process-based approach to writing has multiple merits for the existing literature in terms of analysing the writing journey itself and various ways writers engage in the writing process, the theories proposed to describe writing as a process inform researchers and the literature in different perspectives. This prompts researchers to conduct a more in-depth analysis of theorization of writing. Although all of the major theories which consider writing as a process, namely cognitive, sociocultural, and linguistic, are valuable and make significant contributions to the field, cognitive theory will be the focus of this thesis.

The most important reason is that this study, which inspects the cognitive aspects of writing development and looking for ways to improve the quality of elementary students' writing in broad terms, has its roots in cognitive theory which allows us to analyse individual-level writing processes. Thanks to the shift from the product to process-oriented approach, particular attention is focused on writers' cognitive processes and their role in the writing production. Cognitive theory also

provides the understanding and theoretical tools to examine writing processes of novices which refer to the elementary students in the context of this thesis.

It is also worth noting that cognitive theory does not comprise a single model but rather multiple models are proposed within the scope of the cognitive approach to writing. Within the scope of this thesis, two models are selected to be deeply analysed, namely Hayes & Flower's model (1980) and Bereiter & Scardamalia's Model (1987), as these models not only provide us with explanations for the cognitive process lying behind writing practice but also do so by relating this process to learners' experiences, which is particularly important for this thesis' analysis on early years' (primary school students) writing context.

2.2.1 Writing as a cognitive process

Although most of the writing research focuses on the product or the outcome of writing, the writing process merits further investigation. Writing is considered a complex process that requires the effective use of long-term memory and problem-solving strategies according to cognitive perspective (Deane, et al., 2008). This means that the writer needs to excel at syntax, grammar, organization, content, lexical choice along with the audience and purpose of writing (Weigle, 2009).

It is possible to mention two basic themes about the psychological theories concerning cognitive processes which encourage learners to be more creative and to produce original written texts rather than imitating a model (Perl, 1994). Galbraight (2009) proposes that the first theme focuses on the creation of content bearing the needs of the reader in mind while expressing ideas in a written text. On the other hand, the second theme centres on the idea that the limited capacity of working memory is challenged by the not-so-simple processes during writing.

2.2.1.1 Hayes and Flower's model

The frequently cited model of Hayes and Flower (1980) is an influential model for writing research since, in their model, writing processes were examined experimentally for the first time. To describe their theory, they utilize both cognitive aspects and an understanding of the classroom practice process whereby the learners explore and re-evaluate their thoughts while trying to perceive the meaning before moving to another stage (Zamel, 1985). Thinking aloud protocol, in which the writers are asked to say out loud everything that they think during the process of writing while they are studying (Rodrigues, 1985), is applied in their study in order to understand the process of writing cognitively. Thanks to the analysis of protocols, they contribute to the writing field with a model of the writing process –also mentioned as "a model of competent writers" (Hayes & Flower, 1980a, p. 29) which is commonly used for modelling writing through the use of diagrams which enable learners to evaluate their development in writing.

Providing a basis for writing research, Hayes and Flower's model (1980) is in the midpoint between algorithmic and descriptive models, existing in two versions, one of which is more global and basically utilized as a framework, considering the types of things that appear in written composition (Bereiter & Scardamalia, 1987) (see: Figure 1). In this model, the writing process is considered as a recursive process, implying the planning, translating, and reviewing stages that meet the stages of pre-writing, writing, and post-writing. The monitor has a crucial role in being responsible for the coordination of the processes (Hayes and Flower, 1980).

Basically, the model proposes that there are three main processes that frequently interact during writing:

(a) in the planning stage which is composed of three sub-processes (generation of ideas, organization, and goal setting), a writer generates and organizes his or her ideas;

(b) in translating stage, these plans are transcribed into a written text;

(c) in reviewing stage, the writer makes revisions in terms of the meaning, grammar, and lexical choice (Hayes & Flower, 1980).

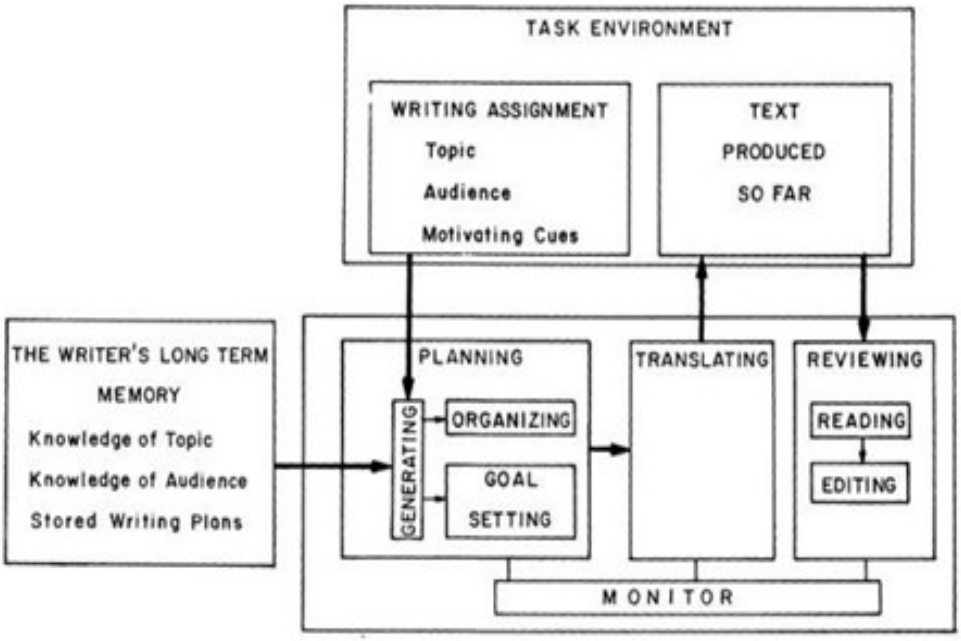

Figure 1. Flower and Hayes' cognitive writing model
Source: [Flower & Hayes, 1981]

Suggesting a simple, preliminary, and approved perspective of the cognitive processes used in writing, Hayes and Flower (1980) draw attention to two seminal components which need to be taken into consideration that coordinate with processes and make use of the long term memory in retrieving the previous knowledge, considering the audience. The first one is the task environment, which is composed

of the nature of the writing assignment; and the second one is the text itself blending the integration of new text with the previously written text (Hayes & Flower, 1980).

The ‘stage models of writing’ is criticized by Hayes and Flower (1980) for having too sharp distinctions, since they basically propose an iterative, fundamental and productive model rather than linear, making use of the inclusion of mental processes, that are set up in a hierarchy in any interaction, in writing attainable. Their research in writing helps them to find out three characteristics in transmitting a writer from being a novice to an expert: responding to all aspects of the rhetorical problem of creating a rich network of goals and representing the problem in-depth (Flower & Hayes, 1980).

Hayes and Flower’s (1980) perspective provides writing research with important stepping points in terms of setting an experimental ground for the linkages between cognitive processes of writing and the understanding of classroom practice, of giving concrete information about various stages of the writing process and of the role played by long term memory in retrieving the previous knowledge.

Despite these merits, Flower and Hayes’ model is not without critiques. The model is mainly criticized for reducing human cognition into a problem-solving metaphor, neglecting mental processes in the writing activities and the sociocultural aspects of writing (Bereiter & Scardamalia, 1988; Kostouli, 2005). Think-aloud protocols are also criticized for providing artificial and unsatisfactory information for the multifaceted cognitive processes of writing (Raimes, 1991), for not reflecting the writing process which may change for different types of writing (Andrews & Smith, 2011), and completely for challenging the role of short term memory (Zamel, 1985).

As evaluated in the context of this thesis, although Flower and Hayes’ model provides a crucial basis for this research particularly through its experimentally

grounded theorization of writing as a process, as mentioned above, its way of undoing this process seems to stay limited to cognitive processes and memory-based explanations with less attention to mental processes and the role of heuristics as a way of solving problems for writers, especially for novices. Given the fact that the working capacity of memory is limited and the text production is a resource-consuming activity (Galbraith, 2009) the model shows weaknesses in the aforementioned points. Besides, as this thesis particularly focuses on the writing process of novices, Flower and Hayes' model also comes short of differentiating the experiences that expert and novice writers undergo during writing, which does not provide the necessary insight for this thesis' goal to understand novices' writing process.

2.2.1.2 Bereiter & Scardamalia's model

Despite having parallel research goals, which is basically the perception of the nature of the cognitive processes in writing, Bereiter and Scardamalia (1987) look from a different angle when compared to Hayes and Flower (1980). Breiter and Scardamalia (1987) mostly focus on the differences between novice and expert writers, which appears promising for providing further explanation for novice writers' text production processes.

In their model, two different models of writing are put forward. The first one, knowledge telling (Figure2.), is associated with the retrieval of general knowledge according to Bereiter and Scardamalia (1987). In the model, the topic identifiers are considered as cues that spontaneously prepare related concepts through a process of spreading activation (Anderson, 1983 as cited in Bereiter and Scardamalia, 1987). In the knowledge telling model, writing is considered a natural and simple task that

requires fewer skills. During the organization process of the text, the content is retrieved from the long-term memory simply for reaching the aim of producing a text. Although the information retrieved might not be relevant, there is a built-in tendency toward topical relevance. As Anderson explains, "spreading activation identifies and favours the processing of information mostly related to the immediate context (or sources of activation)" (Anderson, 1983, p. 86 as cited in Bereiter and Scardamalia, 1987). Therefore, novice writers tend to write what comes into their minds, without a planning process. They modify speech and start producing content rapidly. Since it makes use of readily available knowledge, knowledge telling provides efficient solutions to the problems of novice writers.

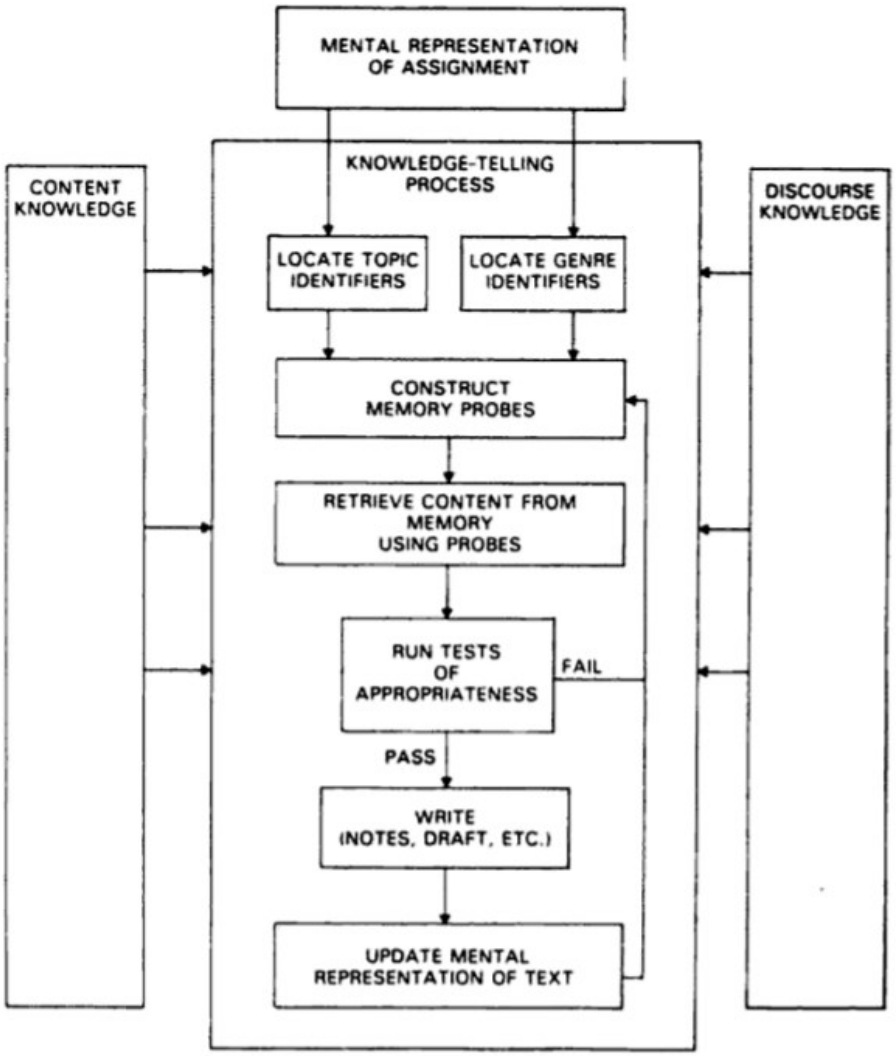

Figure 2. Structure of the knowledge-telling model
Source: [Scardamalia & Bereiter, 1987]

The second one, knowledge transforming (Figure 3.), on the other hand, is considered as a more compound model, trying to describe the development of competent writers. In this model, writers are expected to resolve the rhetorical or communicative problems while they are generating and evaluating the content (Galbraith, 2009). The thoughts that already exist take the form of fully developed thoughts through rethinking and restating. The writers who employ knowledge-transforming strategies assess their texts from a critical perspective, handling the equation of whether what is written says what they want it to say and whether they

themselves believe what the text says (Bereiter & Scardamalia,1987). The more skilful the writer gets, the more demanding the writing task becomes. Writers are engaged with the rhetorical aspects of writing, rather than handwriting fluency or using the phonetic system (Baddeley, 2003). This process simplifies the transition from the 'knowledge telling' to the 'knowledge transforming' processes. Therefore, writing can play a role in the development of their knowledge (Bereiter and Scardamalia, 1987).

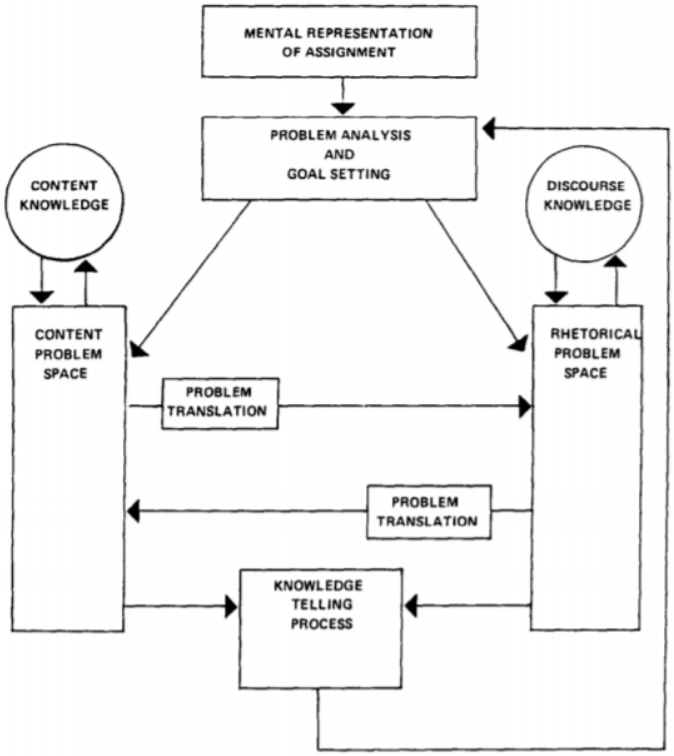

Figure 3. Structure of the knowledge-transforming model
Source: [Scardamalia & Bereiter, 1987]

To sum up, the fact that Bereiter and Scardamalia's distinction between expert and novice writers provides writing research an enlightening perspective as it gives important clues particularly regarding how novice writers with less skill solve

their problems in text production. However, similar to Flower and Hayes' model, their approach does not provide researchers with satisfactory explanations about the problem-solving experiences of novice writers especially in the face of uncertainties, embedded in the writing process and limited working capacity of memory, which is among the questions that this thesis aims to answer.

2.3 Heuristics as a way to solve problems for novice writers

In order to understand deeply what heuristics means, it is first important to examine its roots which lie in the theory of bounded rationality. According to this theory, in solving genuine problems, human beings generally tend to make decisions by considering a few of the alternatives simultaneously, instead of considering all of them in detail (March, 1994; Sauter, 1999). The term "bounded rationality" was proposed by Herbert Simon (1956; 1958), defining rationality as optimization, using the information available, in search of the optimal choice. People simplify the situation and search for a satisfactory solution instead of the optimal one in order to overwhelm bounded rationality, which is called 'Satisficing'. However, decision-makers are compelled to decide by limited cognitive capability and consequently, their decisions may lack rationality (Simon, 1987). Heuristics, therefore, are considered inferior yet useful in terms of limited time and uncertain decisions.

As a reflection of this understanding of writing research, this division between different approaches to heuristics is manifested in different perspectives towards this method as a way of writing for novice writers as well. While focusing on the inferiority part, some argue that heuristics may lead to biases and errors in decision-making (Kahneman & Tversky, 1979; Gilovich & Griffin, 2002), others support heuristics as strategies for finding fast solutions to complex mental processes

(Gigerenzer, 2007; Gigerenzer & Selten, 2001; Gigerenzer & Gaissmaier, 2011). In the next two sections, these two parties will be discussed in detail from a text production perspective with specific attention to their contributions to this thesis' aim to make sense of novices' writing process. As a result of the comparative review of the two approaches, despite its biases, I argue that heuristics go beyond being the second-best in decision making especially in the context of novices' writing process as writing itself is a process full of uncertainties that are unrealistic for novice writers with less skill and lots of cognitive limitations to respond without taking a risk or making any mistake.

2.3.1 Heuristics

> "How do people make decisions when the time is limited, information unreliable and future uncertain?" (Gigerenzer, 2011, p: xvii)

The term heuristic originates from Greek, meaning "serving to find out or discover" (Goldstein & Gigerenzer, 2002). Shortly after its introduction to English, Albert Einstein used the term in his Nobel Prize-winning article to express the useful but incomplete, even false, cognitive processes due to the restrictions of our knowledge (Holton, 1988). Gestalt psychologists used heuristic methods as looking around (Gigerenzer, 2011). Simon (1956) referred to the term as the art of guided search while Polya (1954) stated that heuristics are as essential as analytical thinking in order to deal with problems without logic and theory of probability. Tversky and Kahnemann (1974) used the term as cognitive shortcuts and error-prone cognitive processes known also as the simple set of rules to make decisions and judgments.

Possessing limited vision and being unable to predict the consequences of decisions, people encounter many unexpected problems in their everyday lives. In an uncertain life condition, when there is too much uncertainty, mental shortcuts help people solve their problems or conflicts. Heuristics, which have various definitions (Gigerenzer & Gaissmaier, 2011), function as adaptive tools such as logic and statistics that help people to solve ill-structured problems or when people are supposed to make decisions (Gigerenzer, 2008; Gigerenzer & Gaissmaier, 2011).

Similarly, Shah and Oppenheimer (2008) describe heuristics as strategies that reduce cognitive effort and capacity by applying one or more of the following principles: examining fewer cues, reducing the difficulty associated with retrieving and storing cues, integrating less information, simplifying the weighting principles for cues, or examining fewer alternatives. Gigerenzer and Gaissmaier (2011) propose that heuristics are strategies, making more quick, frugal, or accurate decisions with limited time and little knowledge and also referred to as a scientific name of the rule of thumbs and that judgments made by those tools are named interchangeably as gut feelings, intuitions or hunches (Gigerenzer, 2007).

Since people are not omniscient - having unlimited understanding or knowledge- (Gigerenzer et. al., 1999), they are not capable of performing difficult calculations quickly and impeccably in their heads (Marewski, Schooler, & Gigerenzer, 2010). They rely on their knowledge that will give them the most reasonable result (Gigerenzer & Selten, 2001; Marewski et al., 2010) while making many judgments in everyday life with limited time, sources (Maeyer & Talanque, 2010), and cognitive capacity (Marewski et al, 2010). Under these constraints, people are inclined to make their decisions based on their beliefs (Tversky & Kahneman, 1997).

As naive strategies or “rules of thumb” that humans apply when the problem is intractable and incomputable and when finding an optimal strategy is costly and slow (Gigerenzer, 2006), heuristics reduce the amount of cognitive effort (Shah & Oppenheimer, 2008) when employed in making a decision and finding plausible solutions to their problems (Gigerenzer, 2007) without guaranteeing optimal results (Perkins & Salomon, 1989).

When humans are unable to do rational calculations due to cognitive limitations, they tend to rely on intuition or gut feelings in order to save effort and time (Gigerenzer& Gaissmaier, 2011). Heuristics are robust, implying to be generalized to the new situation and circumstances (Gigerenzer, 2008). From a theoretical perspective, since they require relatively little data, heuristics help decision-makers handle a situation efficiently when they lack time and information (Albar, 2014). Since they exchange the effort utilized in decision making against the accuracy of that decision (Payne, et al., 1993; Eisenhardt & Sull, 2001), heuristics are portrayed as ecologically rational (Bröder, 2000), rather than logical, depending on the structures of information in the environment, and exploiting the exact strategy in decision making accurately (Goldstein & Gigerenzer, 2002; Gigerenzer, 2008). Ecological rationality deals with which heuristics match with environmental structures and where it fails (Gigerenzer, 2008).

Heuristics can also be easily adapted to the new circumstances due to their simplicity (Gigerenzer & Todd, 1999) as well as they are engaged in designing and testing fast, accurate, and simple mental shortcut strategies, instead of considering all the relevant information. They utilize basic psychological capacities such as memory and perception and work even in a shortage of time, information, and /or computing

possibilities instead of more sophisticated processes, as they are too demanding (Goldstein & Gigerenzer, 2002).

As understood, there are several reasons why heuristics appear as an optimal method to make decisions and judgments. One of them is the fact that it eases complex processes for humans as it functions as strategies to come up with fast and accurate solutions to complex problems. Furthermore, it functions effectively under uncertain conditions as it operates in the form of simple shortcuts. Heuristics is also useful in terms of not only saving time and energy but also decreasing the cost of cognitive efforts. In addition, given that the working capacity of cognitive processes is limited and the problem given to be solved might change in different contexts, heuristics is more beneficial to work within solving complex problems with less effort and relatively more precision thanks to its adaptability to new learning environments without any extra efforts.

Based on all these, one can argue that heuristics might have a significant role in the insight of novice writers, which refers to primary school students' writing processes in this thesis. Defined as strategies that can be effectively used by non-expert individuals who need to produce a fast response to complex challenges, heuristics provides us with the explanations required for both understanding and analyzing how non-expert/novice writers who do not have enough knowledge and skills for producing high-level texts deal with writing challenges despite the limitations and uncertainties.

2.3.1.1 Types of heuristics

2.3.1.1.1 Recognition heuristics (RH)

Gigerenzer (2008) defines the recognition heuristic (RH) as inferring that the recognized item has the greater value with regard to the criteria if one of two objects is recognized and the other is not. Utilized in making quick inferences under uncertainty, RH are based on little information, which is less likely to be regarded as valuable, yet; studies show that less time and information can improve decisions (Gigerenzer, 2007). When one option is familiar and the others are unfamiliar, individuals tend to use the RH and choose the familiar option. RH can be said to follow the less is more principle. When there is a lot of recognized information, however, recognition heuristics are less likely to be employed, since all other options are not equally recognizable. For instance, if someone had never heard of Dortmund but had heard of Munich and had to draw a demographic inference, he would conclude that Munich had the larger population (Gigerenzer & Todd, 1999). Similarly, a Turkish student can make accurate forecasts for English F.A. Cup third-round soccer matches simply by using RH, indicated by empirical evidence. Despite knowing very little about English soccer, the Turkish students chose teams based on their familiarity with the team; their prediction accuracy was unexpectedly close to that of knowledgeable English students. (Ayton and Önkal, 2011).

Based on a simple binary differentiation between the novel and the familiar, the world is split into the new and the previously experienced with the term "recognition," as shown by the striped line in Figure 4 (Golstein & Gigerenzer, 1999).

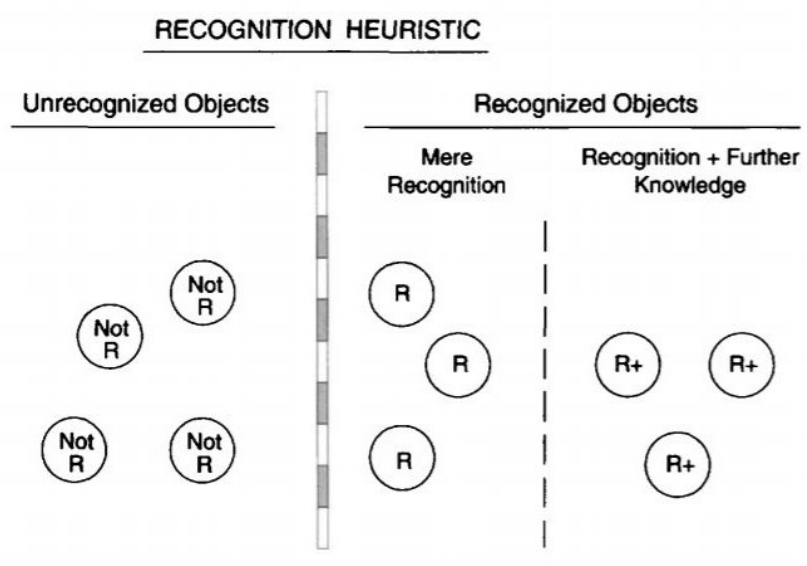

Figure 4. The application of the recognition heuristic to unrecognized items (Not R= not recognized), recognized items (R), and items about which something is known beyond recognition (R+).
Source: [Golstein & Gigerenzer, 1999]

The RH asserts that when a recognized item is contrasted to an unrecognized item, probabilistic inferences are drawn only on the basis of whether the items are recognized or not, ignoring all other relevant cues (Pachur, Bröder & Marewski, 2008).

2.3.1.1.2 Satisficers vs maximizers

Economists and rationalists argue that when individuals are aware of the benefits and drawbacks of their options, they are more likely to make better judgments. Individuals who depend on their intuitions were labeled as satisficers, whereas people who tried hard to achieve the best option were labeled as maximizers, according to several studies on the implications of purchasing and leisure activity selections (Gigerenzer & Selten, 2001). Optimism is followed by increased self-esteem and life satisfaction as a result of satisficers heuristics' limited search through a series of viable options. Maximizers, on the other hand, are said to be less satisfied

with the outcomes of their actions and to be more prone to despair, perfectionism, regret, and self-blame (Schwartz et al., 2002).

2.3.1.1.3 Take-the-best

Decisions are made based on which alternative has the highest value, regardless of other factors (Gigerenzer & Gaissmaier, 2011). The choice is based on a feature that is found to distinguish between the possibilities, and once the differentiation is supplied, the search ends. Otherwise, it proceeds to the next significant characteristic (Armstrong & Graefe, 2010). Instead of sophisticated decision making, take the best heuristics function better in uncertain contexts, and considering only one excellent cue instead of all the cues provides more accurate outcomes (Gigerenzer, 2007).

2.3.1.1.4 Fast and frugal heuristics

Decision-makers employ fast and frugal heuristics to identify a solution among a collection of options within the restrictions of time, knowledge, and computational tools (Todd, 2000). Fast and frugal heuristics are designed to simulate how human minds make judgments under time and knowledge constraints, and they can be just as effective as strategies that employ all available data and costly computation (Gigerenzer & Todd, 1999). They're routinely used in emergency conditions like heart attacks. Fast and frugal heuristics make a range of judgments with minimal information and computation.

Despite these, as mentioned above, there are also those who put more emphasis on the negative aspects of heuristics, which will also be discussed in the next section.

2.3.2 Kahneman and Twersky: heuristics and its biases

To further elaborate on the heuristics and its merits, lastly, it is crucial to understand its critiques. In the existing literature, one of the most important critiques of heuristics comes from Kahneman and Twersky. In the 1970s, Kahnemann and Twersky put forward their heuristics and biases approach which emphasizes the reflexive cognitive operations utilized in managing complex problems. Their approach is based on the idea that "judgment under uncertainty often rests on a limited number of simplifying heuristics rather than extensive algorithmic processing" (Gilovich & Griffin, 2002, p.1).

Having also recognized the practicality of heuristics, Tversky and Kaheneman (1974) argue that sometimes heuristics lead to severe and systematic errors. Thus they consider heuristics as the second best. Criticizing the utility theory as a descriptive model of decision making under risk, Kahneman and Tversky (1979) develop an alternative model, known also as the prospect theory. According to this theory, people tend to underestimate the outcomes that are only probable in comparison with outcomes that are gained with certainty, namely the certainty effect. Therefore, people don't employ risky choices that involve sure gains and make use of risk-seeking in choices of sure losses. Additionally, people usually reject components shared by all prospects under consideration which is called the isolation effect, leading to conflicting preferences when the same choice is offered differently (Kahneman and Tversky, 1979).

Considering human interfaces as error-prone, Tversky and Kahneman (1974) state that, despite doing better than non-experts, all humans are inclined to the same biases when they employ their intuition in decision making (Lewens, 2007). Both bounded rationality and heuristics and bias consider heuristics as "discrepancies

between these rational strategies and actual human thought processes" (Smith & Gilhooly, 2006, p. 75), referring to an unreliable and inferior technique for making decisions (Goldstein & Gigerenzer, 2002).

As understood, Tversky and Kahneman criticize heuristics mainly on the basis of human beings' proneness to errors and heuristics' inability to offer plausible solutions to problems. For them, all these are important problems particularly when it comes to the biases heuristics produce in the human mind and the resulting systematic errors which might lead to severe outcomes for people who use heuristics in making decisions under uncertainty. However, as this thesis also suggests, decisions under uncertainty are not deficiency/weakness but superiority when the risk is incalculable and time and source are restricted as in the case of primary school students who do have limited writing knowledge and skills and are asked to produce texts in a limited time with limited resources.

In support of the idea that heuristics is more than just being the second best, two conceptual revolutions might be mentioned. The first one, also known as the probabilistic revolution, refers to the end of the dream of certainty and the rise of the calculus of uncertainty, in which cognitive capacity is assumed to be computations performed on probabilities and utilities (Gigerenzer & Murray, 1987).

In real-world situations that people live through, rather than simple restrained settings, the time, knowledge, and computation grow unattainably large, turning into the psychology that is suitable to humans alone.

The second revolution covers how the minds cope with an uncertain world, producing simply uncertain knowledge. Providing a bold vision of reality, it is proposed that the majority of human decision-making can be modelled using fast and

frugal heuristics that make inferences under time and knowledge constraints, without involving computation of probabilities and utilities.

Lastly, several experiments conducted about making inferences in various fields such as psychology, sociology, and economy show that simple heuristics can provide accurate inferences as much as regression calculations (Czerlinski, Gigerenzer, & Goldstein,1999). Gigerenzer and Gaissmaier (2011) propose that if they are adapted to the appropriate environment, heuristics can help people make better inferences, and get more accurate results by ignoring some information. One of the main arguments lying behind this is that different types of heuristics can be employed by humans in different contexts and settings. As Todd, Fiddick and Krauss (2000) suggest decision-makers use a variety of heuristics in different task settings, which are unconsciously favoured in line with the information structures in the task environment.

To sum, as these two revolutions suggest, Tversky and Kahneman's critiques of heuristics are not based on solid grounds. This is mainly due to the fact that neither the bold reality of life itself gives humans an environment of certainty that they rely on nor the ideal of dealing with all the possibilities of real-life with a full perfection is real. This idea might be well understood through the world of writing as well, mainly because writing itself is as complex and uncertain as real life and its challenges for the human mind. In that sense, a novice writer who tries to produce a text is no different from a human being who tries to live a life with all its challenges, risks, and uncertainties.

Besides, as the previous studies show, the fact that heuristics can be applied to different settings and contexts thanks to its variations which function unconsciously without creating an extra burden to the human mind is another crucial

point that shows that heuristics is more than being the second best. This is a vital advantage provided by heuristics, especially for novice writing. When applied to the setting of writing where novice writers are asked to produce texts in different contexts which might require them to come up with different ideas employing different ways of evaluating, heuristics' ability to adapt to different settings becomes particularly important. It is also significant to note that compared to other theories which are not based on experiments thereby fail to produce satisfactory explanations for the real-life setting, as the above-mentioned experimental studies show, heuristics provide us strategies that are tested and applicable to diverse environments.

2.4 Conclusion: heuristics is more than the second best

As stated before, writing is a challenging task to complete. When it comes to novices, it becomes even more challenging due to the knowledge and skills required for producing a text. To overcome these challenges and to be able to properly complete the task of writing, writers, especially novices, experience the writing challenge in different ways. Yet, before asking the question of how, as informed by the existing literature, one needs to understand what writing is really about.

In the pursuit of this question, the literature provides us with mainly two points of view. One is based on the consideration of writing as a product, where writing is evaluated and examined in line with what is produced at the end. Others, on the other hand, pay more attention to the process of writing, giving credit to writing itself as something that needs to be understood and analyzed. Based on the critical examination of both arguments, this thesis suggests that to answer the question of how writing challenges can be dealt with and, when it comes to novices, how non-expert writers can go through writing, it is important to take writing as a process.

Furthermore, as analysed in detail above, there are different approaches to writing as a process. Although there are more than one, this thesis particularly focuses on the cognitive dimension of the issue as it fits more into the context of this thesis which aims to evaluate writing in terms of novices' experiences and their strategies of text production. Although those who see writing in terms of the cognitive processes lying behind writing, they either do not provide researchers with a solid differentiation between expert and novice writers, which is important to understand in this thesis, or do not provide satisfactory explanations about how novice writers deal with challenges of writing especially in the face of uncertainties inherent in the process of writing itself. All these combined with the limitations of memory, time, and resources, these approaches fail to enable us to answer the questions about novice writers' writing experiences as well as their ways of dealing with challenges in the least costly and simplest manner.

This brings us to heuristics which is often defined as strategies that help humans make decisions when the optimal strategy is time, resource, and energy-consuming and the problem-solvers are not able to make totally rational calculations because of limitations in employing cognitive methods. In the context of this thesis, these qualifications of heuristics become even more crucial as these limitations and hardships are valid for the novice writers (primary school students) the most as, in this case, the problem-solvers neither have the required knowledge and skills nor have the resources and time complete the task of writing as they are asked. This is, as argued in this thesis, what makes heuristics the best fit for answering the questions of this thesis and providing a theoretical ground for the experiment conducted.

However, when compared to other theories, heuristics become even more prominent with its advantages. One of the most important features of heuristics stems

from the analogy between life and writing. Just as real-life itself, with its uncertainties and challenges, various contexts changing from moment to moment, and imperfections, writing is a process that is hard to understand and go through with crude rationality, perfectionism, and certainty. This is the reason why, despite its critiques, heuristics is more than the second-best. It is important to note that this thesis does not defy the criticisms emerging from the heuristics' biases and uncertainties but rather argues that these are not deficiencies or weaknesses but superiorities of heuristics especially when the risk is hard to be calculated, and time and sources are limited. As a result of the review of the existing literature, this idea finds its best manifestation in the case of primary school students' writing processes which this thesis aims to analyse.

To provide an experimental ground for the role of heuristics in novice writing, in the next chapters, the study conducted with the students as novice writers will be discussed. First, the methodology of the study and then the analysis of findings will be shared in light of the theoretical framework provided by heuristics.

CHAPTER 3

METHOD

The overall goal of this research is to support novice writers' progress in composition writing through the use of decision-making strategies, using cognitive processes explanation of composing written text. The purpose is to account for the expeditious decision process novice writers engage when deciding what to write and how to write it. This chapter talks about the design of the study with the hypotheses of the study, data collection procedures, and data analysis.

3.1 The design of the study

The selection of the composition subjects made by the participants, who are considered as novice writers, with the help of the protocol adapted from the heuristic research provides the data of the research.

A quantitative method has been adopted in the design of this study, which is a systematic method based on collecting, analysing, and interpreting quantitative data that is generalized to different conditions (Dörnyei, 2007) by examining the relationship among measurable variables (Creswell, 2013). This method aims to understand and clarify the issues in the research questions using quantitative data along with statistical procedures (Creswell, 2012).

The study is an experimental study using a within-subject design in which each subject is exposed to several treatments concurrently (Charness et.al.,2012) and is mostly preferred when the generalization context is included to examine the effects of treatments (Greenwald, 1976).

In the study, the experimental design was employed in order to examine heuristic decision-making strategies on writing achievement. The experiment measures choice preferences, using a two-alternative forced-choice procedure which demands subjects to carry out a simple decision task, by bounding the response to a binary decision. Additionally, by providing a large number of data points, the two-alternative forced-choice procedure enables statistically coherent data analysis (Jogan, 2014).

The independent variable in the study is the item recognition status (recognized, slightly recognized, unrecognized). The dependent variables in the study are participants' choice responses and corresponding response times. The dependent and independent variables of the study are shown in Table 1.

Table 1. The Variables of the Study

Independent Variable	Dependent Variables
Item recognition status	Participants' choice responses
	Corresponding response times

3.2 The context and participants

The population of the study was fourth-grade primary school students who are considered novice writers in İstanbul, Turkey. The participants were chosen, using convenience sampling. Since the researcher is an English language teacher in a primary school in İstanbul, the respondents were selected based on their convenience and availability (Creswell, 2013), and meeting the following criteria: (a) Novice writers, (b) primary school fourth-grade students.

The study was conducted in the 2019-2020 Education Year in a primary school in İstanbul, Turkey, and it was administered to all of the fourth-grade students in the school. One hundred female and 117 male students participated in the study, with a total number of 217 pupils whose ages range from nine to 10. They did not attend any course or after-school activities related to writing courses, therefore, they did not have any prior knowledge of writing. Although the school is located in a wealthy neighbourhood, the pupils are mostly from low or medium-income families.

The school where the study was conducted was equipped with sufficient infrastructure in terms of the Internet and computer requirements, and the study was carried out in a study room at the school with the permission of the administrators.

3.3 Data source

The design of this study makes use of quantitative data. The quantitative data source is the identifier list and topic sentence pairs, and the outputs of the software which is specially designed for the study.

3.3.1 Quantitative data source

3.3.1.1 Identifier List and Topic Sentence Pairs

In the 2018-2019 Education Year, the prior year of the study, identifier list (Appendix A) and topic sentence pairs (Appendix B) were generated by consulting ten fourth-grade classroom teachers for the grade level appropriateness of the 100 topical terms. They checked the appropriateness of the topical terms in line with the curriculum, relying on their domain expertise. The study was conducted in Turkish, mother tongue of the participants. The identifiers were listed in alphabetical order. In

order to check the recognition range of the identifiers, the papers in which identifiers were listed, were distributed to fourth-grade students, with a total number of 178. The pupils were asked to put a tick in the column of the identifier whether they are familiar or not (either Recognized, Slightly Recognized, or Unrecognized). They were instructed as in the follows:

a) How much do you use or get to know the words below in your daily life?
b) Try to answer as fast as you can and put a tick for the option that first comes into your mind.

Each paper was numbered; the names of the participants were not collected. After the collection of the papers, the data was entered in google forms manually. According to the results obtained from the analysis, 10 identifiers, which were highly recognized, were replaced with new identifiers. The new identifier list was given to 25 students who had not participated in the previous task and hence had not seen the prior identifier list. According to the results gained from the forms, the new identifier list was employed in the research along with 250 topic sentences.

3.3.1.2 Designed software application

The experiment was written in C-Sharp .Net Core 3.0 WPF and run on a laptop computer.

The data are saved in a database to make it easier to extract. SQLite is employed in the database so that it may be utilized on personal Computers with convenience. Aside from that, an excel sheet was included as an output in the database. The WPF (Windows Presentation Forms) system, which is a system based on developing desktop applications using C #, is utilized as a platform to enable full-screen operation.

The application provides a choice screen for the participants. The data extracted from the participants' choices is used in forming the pairing topic sentences.

The application provides two topic sentences that contain two variants of 100 topic-identifying words, each of which is rated on recognition using the labels "Recognised," "Slightly Recognized," and "Unrecognized" by each participant. The criteria of the identifiers' recognition status in the sentences in terms of sentence pairs are as follows:

Table 2. The Criteria of the Identifiers' Recognition Status

	1. Criteria	2. Criteria	3 Criteria	4. Criteria	5th Criteria
1st Sentence	RR	RR	RS	RU	SS
2nd Sentence	UU	SS	SR	UR	UU

Abbreviations: R=Recognized, S=Slightly Recognized, U=Unrecognized

The switched versions of the identifiers are also included in the procedure for the third and fourth criteria. As a result, it will be easier to see the students' choices when the positions of the identical phrases shift. Aside from that, there is a scenario in which all of the sentences in the test for all criteria are selected randomly and presented to the student once again.

No alteration is done in the topic sentences and the sentences are selected randomly by the application, with a 30 % repetition rate. Upon completion of at least three questions, the student may be presented with repeating questions.

3.4 Pilot study

The first pilot study was conducted with 15 primary school fourth-grade students.

With the developed software, firstly, 100 terms that could be the subject of composition appropriate for the fourth grade level of primary school were shown to each participant, and after the participant marked the term on the screen as "Recognized (R)" or "Unrecognized (U)" by pushing the left arrow with the index finger for yes and the right arrow for no, the next term was displayed on the screen. This session lasted about five minutes. In the second session of the pilot study, the participants are provided with sentence pairs, drawn automatically by the software in accordance with the participants' recognition status of the identifiers. The participants chose the topic sentence which they want to write a composition about.

Six of the nine participants, who chose from more than 30 sentence pairs out of 15 participants, chose sentences with which they knew both terms in order to write a composition with a percentage of over 50%. Except for one of the participants, the number of the selected sentences, which the first term and the second term they know, are close to each other.

The percentage of choosing sentences that they do not know both terms is below 10% in 15 participants. Participants' choices of sentences containing terms they recognized and unrecognized in the pilot study are shown in Table 3.

Table 3. Participants' Choices of Sentences

Both terms are recognized		First term recognized, Second term unrecognized		First term unrecognized, Second term recognized		Both terms are unrecognized		Total sentences selected
Number	%	Number	%	Number	%	Number	%	Total
52	61.2	12	14.1	14	16.5	7	8.2	85
42	56.8	15	20.3	15	20.3	2	2.7	74
26	72.7	15	11.4	13	13.6	4	2.3	58
32	44.8	5	25.9	6	22.4	1	6.9	44
9	51.6	20	25.8	10	22.6	3	0	42
13	55.6	11	22.2	7	18.5	2	3.7	33
11	55.6	9	25.9	11	18.5	2	0	33
16	45.2	8	32.3	7	12.9	0	9.7	31
14	39.4	10	33.3	4	21.2	3	6.1	31
15	57.1	6	14.3	5	28.6	1	0	27
15	44	7	32	5	24	0	0	27
11	33.3	8	27.3	6	33.3	0	6.1	25
12	21.4	3	47.6	6	23.8	0	7.1	21
8	42.1	4	21.1	6	31.6	1	5.3	19
4	33.3	6	50	2	16.7	0	0	12

Source: [Erkunt & Biçer Özdemir, 2019]

In the second pilot study, the renewed identifier list was employed, and additionally the recognition status “Slightly Recognized (S)” was integrated in the recognition task. The rest of the protocol was the same with the first pilot study. The findings of the study conducted with 16 participants with the renewed protocol are shown in Table 4., according to the characteristics of the sentence pairs displayed on the screen. The results of the second pilot study indicates that the participants choose the topic sentences with recognized identifiers with a percent of 67.7% over unrecognized identifiers in the RR- UU sentence pairs.

Table 4. Distribution of Sentence Pairs

Expected criteria	1st Term	2nd Term	Total number of pairs	Status	Chose when 1st Term	%
1	R	R	31	R	21	67.7
	U	U		U	10	32.3
2	R	R	111	R	57	51.4
	S	S		S	54	48.6
3	R	S	404	R	204	50.5
	S	R		U	200	49.5
4	R	U	139	R	81	58.3
	U	R		U	58	41.7
5	U	R	37	U	14	37.8
	R	U		R	23	62.2
6	S	R	113	S	59	52.2
	R	S		R	54	47.8

Source: [Erkunt & Biçer Özdemir, 2019]

3.5 Data collection

Data were collected using a simple computer setup consisting of a laptop with a touch-screen to provide an easier and simpler input for the participant. The researcher's laptop was used to collect data, as the program software, which was the basic requirement of the study, was installed in the researcher's laptop. A total of 217 students took part in the research. There were 100 female and 117 male students. Participants were seated in a study room in a quiet location in their school, in order not to be disturbed or interrupted by any means. The participants were taken in the study room one by one, under the supervision of the researcher to minimize possible distractions, and the sessions lasted for approximately 10 minutes. The participants took part in the study in their free activity hours, without reasoning about any deficiency of their own curriculum.

A recognition task was presented to the participants initially, followed by a preference choice task.

3.6 The recognition task

The recognition task required each participant to label each topic identifier presented at random from a list of 100 identifiers as recognized (R), slightly recognized (S), or unrecognized (U). Each participant's selections were recorded as their actual recognition response.

The participants were instructed about the data collection procedure as follows:

"We will first show you a number of topics and ask you to tell us whether you are familiar or not with them by saying either Recognized, Slightly Recognized, or Unrecognized, by touching one of the options on the screen. We will make a few

practice runs so that you get comfortable with it. After the practice, you will see a + sign on the screen. We would like you to fix your gaze on it and wait for the instructions."

The participants were shown 10 single items first for the practice run. After the practice, they saw a + sign on the screen meaning that they could start the process when they felt ready. In the first session, the participants were shown 100 topic items (topical cues) in alphabetical order, and they chose one of the options either Recognized (R), Slightly recognized (S), or Unrecognized (U), by touching on the screen. This first session lasted approximately 5 minutes.

3.7 The preferential choice task

The preferential choice task required each participant to select one of two writing instructions displayed on the screen as their preferred topic for writing. Based on each participant's actual recognition responses, the pair of writing instructions were chosen out of an identical list of 250 topic sentences. Two topic identifier terms were included within the sentence as cues for making a decision in each of the 250 writing instructions. The number of decisions a participant made and the recognition response combinations they encountered were determined by their actual recognition responses.

The participants were instructed for the second session as follows: "Now that you have seen many different identifiers, we will show you some topics to write about and we would like you to pick which topic you would like to write about?" Then, based on their choice, they will be shown pairings of the topic sentences consisting of either recognized and unrecognized; recognized and slightly recognized; slightly recognized and unrecognized.

Here is an example choice screen containing two writing instructions (all writing instructions were written in participants' native language Turkish).

Table 5. Choice Screen Sample

Topic identifier terms included	Recognition configuration	The writing instruction
Traditions Environmental awareness	RR	How do you believe our traditions influence society's environmental awareness?
Internet Relations	UU	Is it dangerous to establish social relations over the internet?

In the second session, participants were asked to choose which topic they would like to write about given a pair of topics. These topics were made up from topical cues they have provided feedback for in the previous session. Participants were asked to choose one from about 50-80 pairs of possible topics they would like to write about over the other option, out of 250 writing topics in total. The participants were expected to use certain heuristics for certain pairs.

3.8 Data analysis

The study uses option pairs with precise recognition configurations based on participants' actual recognition responses, which are obtained from a 100-item recognition task. In the preference task, participants make decisions. The number of choices made and the recognition configurations used are determined by each participant's actual recognition responses. At the group level, choice preferences are

examined. Response times were examined at both the group and individual levels to see whether any factors were potentially distorting or masking individual differences.

The proposed software generates an output based on the choices made, and a t-test was applied to identify the relationship between preferential choices and reaction time.

It is hypothesized that (1) when given the task of writing a written composition, novice writers are likely to use a heuristic decision-making strategy and that (2) when determining what to write, they would use simple Recognition Heuristics. When employing the Recognition Heuristic to make a decision, participants will take less time than they would be using other strategies. In a nutshell, it is hypothesised that participants will pick recognized things quicker, whereas unrecognized items will take more time.

3.9 Ethical considerations

The Ethics Committee for Master and Ph.D. Theses in Social Sciences and Humanities' (SOBETİK) ethical criteria were used as the gold standard for ethical concerns in the design of this study. The ethics committee of Bogazici University approved the proposal based on an application submitted on April 18th, 2019 (Appendix C). The school's and participants' anonymity is guaranteed. As a result, all participants were given ID numbers, which were used instead of their personal information when data analysis, interpretation, and reporting were required. Because the pupils are primary school students, participation and data exchange were predicated on the consent of their parents. Before beginning the data gathering process, legal approvals from the school were also obtained. Consent documents that

formally notify all participants about the study's goal and methodology are used to document voluntary participation (Appendix D).

CHAPTER 4

RESULTS

This chapter contains the results of the analysis performed to address the research questions. In the study, the default decision strategies of novice writers are explored for a digital environment that supports writing. Since they are novices, they are expected to decide using mental shortcuts (heuristics). Therefore, students are provided with two topic sentences, which include identifier terms that they recognize and do not recognize, and they are asked to select one of the topic sentences. Since the novice writers do knowledge-telling, when two recognized and two unrecognized are given, students select the sentences which include the recognized identifiers by 65%, in terms of selection percentage.

Both descriptive and inferential statistics were used to report on the data analysis for each research question in great detail. The findings are reported in two sections in this chapter, addressing the main research questions: rate of selection of recognized identifiers and the students' response times.

4.1 Selection rates

4.1.1 Research Question 1: “When given two sentences to choose from, what is the rate of selection for sentences expected to be selected?”

The data of the question independent of the participants (Q1) was analysed by descriptive statistics results showing that the recognized identifiers are selected more than unrecognized identifiers by a (61.1 %) (see Table 6.). The mean proportion of choices of the sentences with recognized terms was calculated for each subject. By

217 participants, 15076 (69.4%) of the topic identifier terms were recognized, 4034 (18.6%) were slightly recognized, and 2590 (12%) were unrecognized.

In the recognition task, participants assessed a total of 21700 topic identifier terms, with 15076 (69.4%) being recognized, 4034 (18.6%) being slightly recognized, and 2590 (12%) being unrecognized. A total number of 217 participants made 10786 choices in the following preference task, with an average of 50 choices per individual. There were 1113 (10.3 percent) writing assignment pairings that contrasted recognized and unrecognized items. 1537 (14.2%) writing assignment pairs opposed recognized items versus slightly recognized items, while 8136 (75.4%) writing assignment pairs represented various reversed recognition configurations (5445 SR-RS pairs, 2068 RU-UR pairs, and 623 UR-RU pairs).

Only 2660 (24%) of the 10796 decisions were critical pair configurations, which was fewer than predicted considering that only 12% of all terms were rated as unrecognized by the participants, which limited the number of critical pairs. The number of choices made by participants per recognition configuration and their selection rates are shown in Table 6.

Table 6. The Number of Choices per Recognition Configuration

Recognition configurations of the writing assignment pairs for selection	Expected Selection	Total number of selections per configuration	Number of times the first writing assignment is selected	% rate of selection of the first writing assignment	% rate in total selections
RR-UU	RR	796	486	61.1%	7.4%
UU-RR	RR	317	123	38.8%	2.9%
RR or SS**-UU	RR	1138	686	65.9%	
RR-SS	RR	1126	652	57.9%	10%
SS-RR	RR	411	175	42.6%	3.8%
SR-RS	RS	5445	2804	51.5%	50%
RU-UR	RU	2068	1070	51.7%	19.1%
UR-RU	RU	623	292	46.9%	5.8%

*Item types: R=Recognized, S= Slightly recognized, U= Unrecognized
**R+S= The first part of the writing assignment's configuration is either RR or SS.

4.1.1.1 RR-UU range

Seven hundred thirty-eight RR-UU and 317 UU-RR critical pairs were selected by the participants, in which they chose to write assignments using recognized items 61.1 % in RR-UU and 61.2 % UU-RR critical pairs, as shown in Figure 5. Individual difference of the participants has an effect on their choice. Out of 217 participants, 120 chose the RR-UU configuration at least once. In all, 32 individuals picked RR all the time, whereas 24 participants chose UU 50% of the time. RR was chosen 80 % of the time by 120 participants.

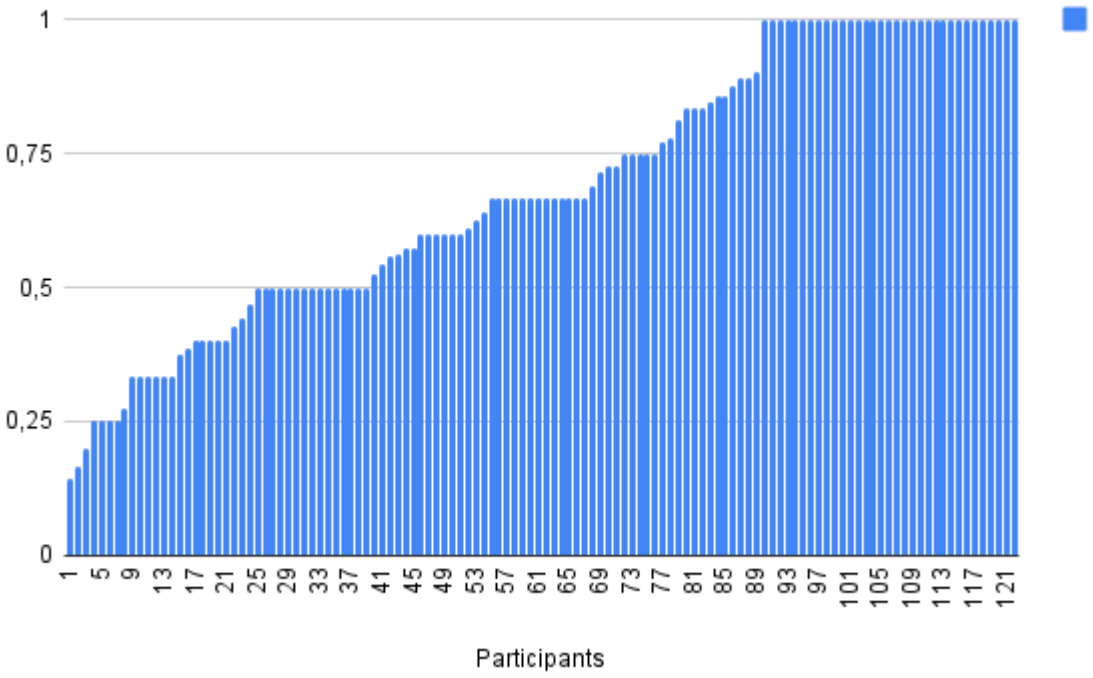

Figure 5. RR-UU Range of participants

4.1.1.2 UU-RR range

As shown in Figure 6, out of 103 participants that made at least one selection of the UU-RR configuration, 52 participants chose RR all the time; whereas 33 participants chose UU. Participants picked from 1138 R+S-UU writing assignment pairings, presuming that slightly recognized (S) items are more similar to recognized items rather than unrecognized ones. They chose writing tasks with items they recognized or slightly recognized 65.9% of the time.

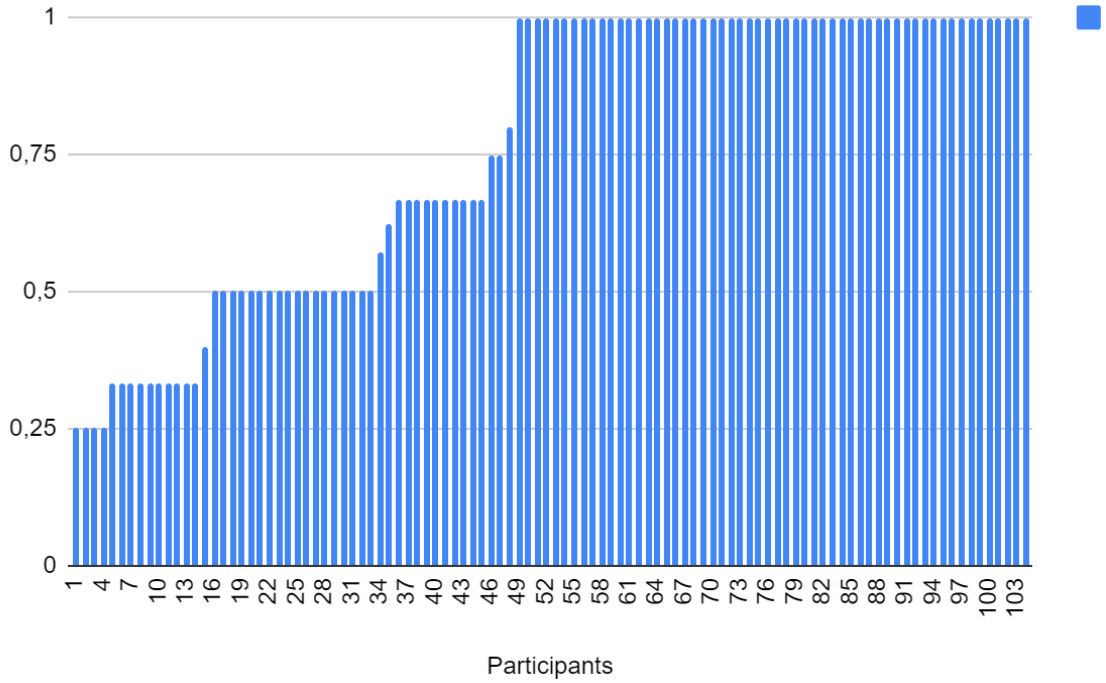

Figure 6. UU- RR Range of participants

4.1.1.3 RR-SS and SS-RR range

Out of 160 participants that made at least one RR-SS selection, only 30 of them chose SS below 50% all the time while 81% of participants chose RR over 50%, as shown in Figure 7.

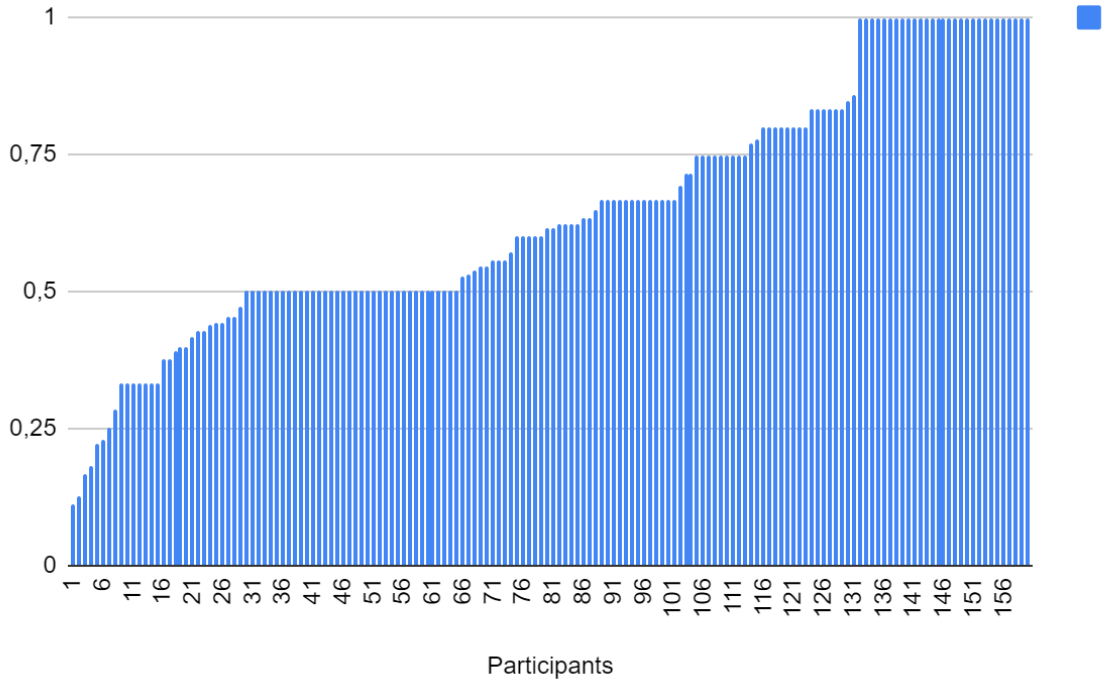

Figure 7. RR- SS Range of participants

As shown in Figure 8, out of 1126 RR-SS and 411 SS-RR writing assignment pairs that were used to compare recognized items with those that were slightly recognized, the participants chose the writing assignments with recognized items 57.9% and 57.4% of the time, respectively.

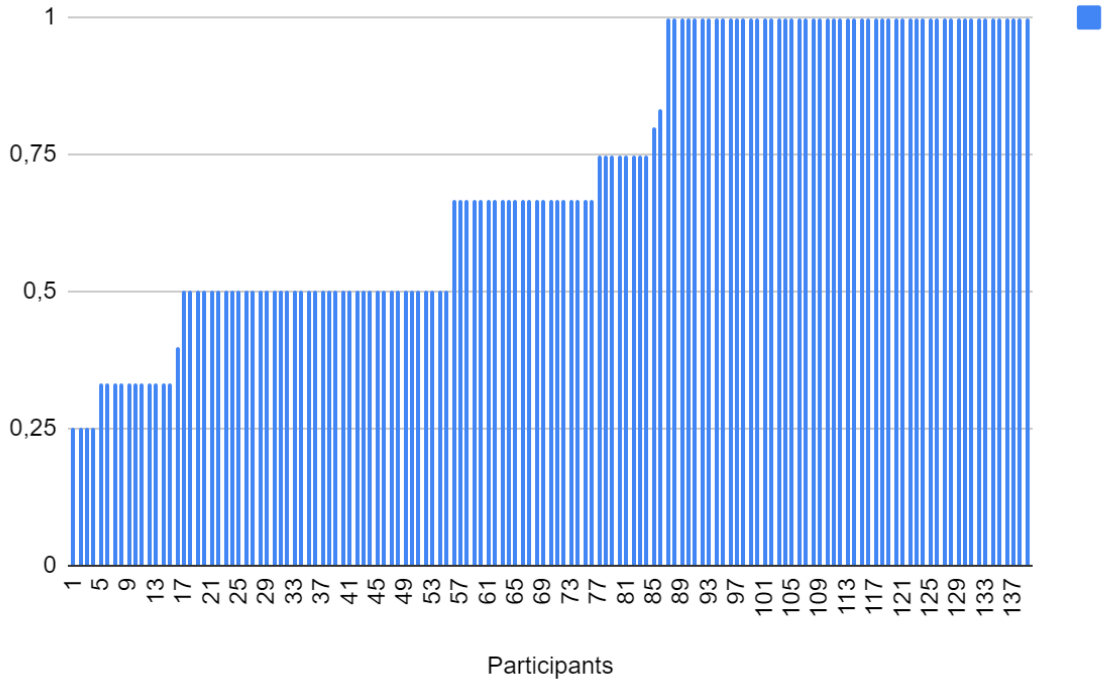

Figure 8. SS- RR Range of participants

To explore a positional affect recognition status, we changed the order of appearance for some items in a writing task. The participants picked the recognized elements that were placed first in the first assignment (RU) out of 2068 RU-UR writing task pairs, 51.7 %of the time. They also picked among 623 UR-RU writing assignment pairings, and 53.1 percent of the time, they picked the recognized items placed first in the second assignment (RU). Finally, participants picked among 5445 SR-RS writing task pairs, with 51.5 % choosing recognized items placed first in the first assignment (RS).

4.2 Response time

4.2.1 Research Question 2: " When given two sentences to choose from, what is the difference between each participant's average response time for expected selection than the response time for the other selection?

The participant-dependent question (Q2) data were analyzed using descriptive statistics and a t-test. The mean response times measured for all sections provided the particular response times for each recognition configuration. For some recognition configurations, a paired t-test which was conducted with the alternative hypothesis that the true differences in means are not equal to zero revealed that the recognition effect was not random. Time limitations were employed in the analysis in order to exclude exceptionally long reaction times.

4.2.1.1 RR-UU pairs

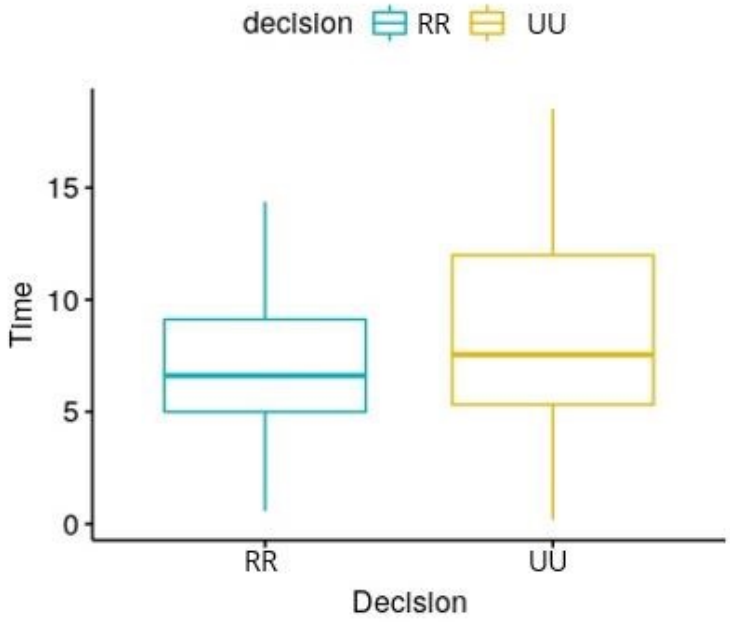

Figure 9. Participants' response times in RR-UU pairs

Considering RR and UU critical pairs, the response time of the participants for the RR writing tasks is statistically faster (M= -1.35, SD=0.41) than their response time for the UU writing tasks, with response times under 16 seconds for RR and under 19 seconds for UU. The effect size is small, t (77) = t -3.13, p= 0.002.

4.2.1.2 RR-SS pairs

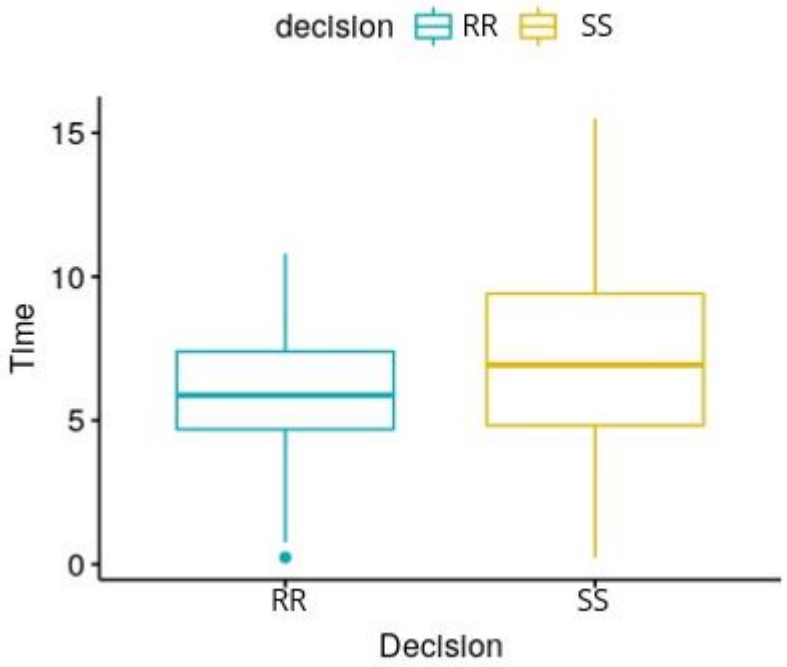

Figure 10. Participants' response times in RR-SS pairs

In terms of RR and SS critical pairs, the response time of participants for the RR writing tasks is significantly faster (M= -1.14, SD= 0.48) than their response time for the SS writing tasks. with response times under 11 seconds for RR and under 16 seconds for UU. The effect size was small, t (97)= t= -3.56, p= 0.0005.

4.2.1.3 RU-UR pairs

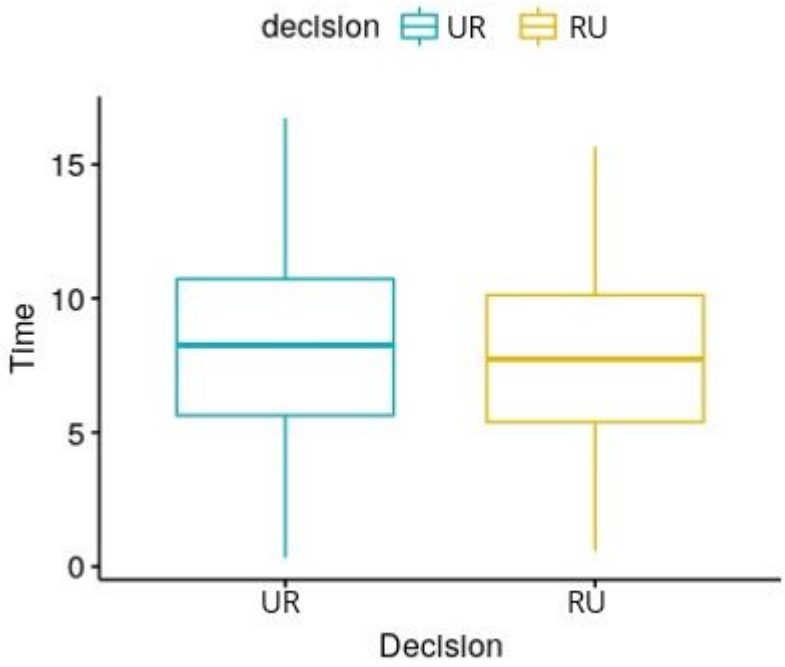

Figure 11. Participants' response times in RU-UR pairs

Considering the RU and UR critical pairs, the participants' response time for the RU writing tasks is significantly faster (M=0 .57, SD = 0.09) than their response time for the UR writing tasks with response times under 16 seconds both for RU and UR. The effect size was small, t (97) = t 2 .01, p = 0 .04.

4.2.1.4 UR-RU pairs

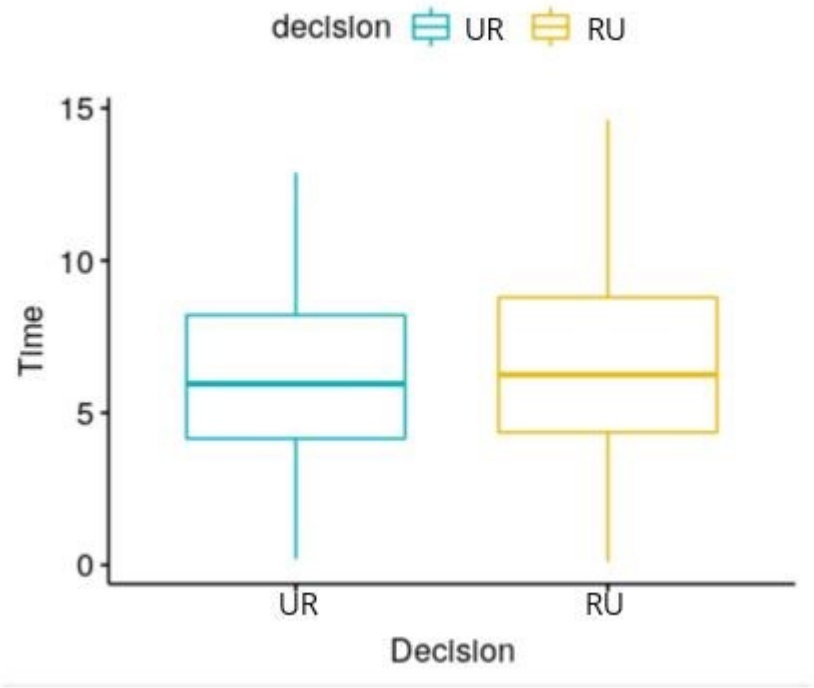

Figure 12. Participants' response times in UR-RU pairs

Unexpectedly, in terms of UR and RU critical pairs, the response time of participants for the UR writing tasks is significantly faster (M = - .47, SD = 0.06) than their response time for the RU writing tasks with response times under 16 seconds both for UR and RU. The effect size was small, t (97) = t -1.51, p= 0.13.

CHAPTER 5

DISCUSSION AND CONCLUSION

The purpose of this research was to design and implement special digital task environments that assist primary school fourth-grade students, who are considered as novice writers in progressing toward more expert-like composition writing by triggering various decision-making strategies that lead them to employ cognitive processes and skills, in terms of generating ideas while writing a composition. In order to reveal the effect of RH on students' choices, software was designed, figuring out the selection rates of recognized and slightly recognized items over unrecognized items. Additionally, the software provided the required data for the response time of the students for recognized, slightly recognized, and unrecognized topic sentence pairs.

The findings of each research question, limitations of the study, and further research suggestions are discussed in the following section.

5.1 The role of recognition heuristics on novice writers' choices

The following Participant independent question was investigated in order to reveal the role of RH on novice writers' choices: when given two sentences to choose from, what is the rate of selection for sentences expected to be selected? It was hypothesized that the recognized identifiers will be selected more than unrecognized identifiers in the recognition task.

In the initial section of the research, the focus was to investigate the role of the RH as a descriptive model for novice writer's topic selection for writing assignments. Bereiter and Scardamalia (1987) propose that novice writers go through

a mental process called Knowledge -Telling in which they utilize information from the writing task to build cues that help them recall topical and structural knowledge from memory. Novices come up with a list of relevant content pieces and write them down. It takes merely five or 10 seconds to start writing for fourth and fifth-grade elementary students.

The RH, which is efficient in making inferences about unknown features of the universe, can be used in a variety of ways as a mechanism for two-alternative choice (Goldstein and Gigerenzer, 1999). Thanks to a useful degree of ignorance, RH can make accurate inferences, relying mostly on a single piece of information, when selecting between two objects and only one is recognized (Borges et. al.1999). RH is frequently employed when there is a need for a quick decision (Michalkiewicz and Erdfelder, 2016), having a high value with respect to the criterion (Gigerenzer, 2008) under time pressure (Del Campo and others, 2016). In the recognition task of this study, the participants were given two sentences and were asked to choose one about which they are more likely to write a composition. All of the sentences contained two variants of 100 topic identifying words, each of which were judged by each participant in terms of recognition using labels “Recognized (R)”, “Slightly Recognized (S)” and “Unrecognized (U)”. The pairs that compare sentences that contain recognized items with unrecognized items are considered as critical pairs.

In terms of the critical pairs, it is anticipated that participants will choose sentences with recognized topic identifiers over the sentences with slightly recognized or unrecognized topic identifiers, and the order of the topic identifier words in sentences will not affect their choice.

Writing instructions using recognized items was chosen at a rate of 61.1% by the participants. Since slightly recognized items are considered as recognized items

when compared with unrecognized items, and the combination of the sentences that contained both recognized and slightly recognized items over unrecognized items was 65.9%. Additionally, the rate of selection with recognized vs. slightly recognized items was 57.5%. In order to identify the students' selection contrasting identifiers are switched, for instance, a sentence containing a recognized identifier pairing with an unrecognized identifier matched with a sentence in which the identifiers are reversed (an RU—UR or UR-RU pair), the selection rate was about 52%. When recognized and slightly modified items are given as within assignment modifications (SR-RS pairs) for a decision, the selection rate was about 50%.

The selection rate was roughly 50% when recognized, slightly recognized, and unrecognized items were switched within a writing instruction (RU—UR, UR-RU, and SR—RS pairs), implying that participants pick at random when encountered with such switched combinations. When compared to slightly recognized items, the recognition rate of 57.5 % for RR—SS and SS-RR combinations appears to be a relevant aspect that influences the participants' selection.

Individual differences are also taken into account while making choices to avoid prospective findings being distorted by group averages. RR-UU was selected by over half of all participants (the group average is 5.1). A third of individuals who did so chose recognized items all of the time, a quarter chose recognized items half of the time, and one out of every two people chose recognized items 80 % of the time. When it comes to choosing writing tasks, it appears that most participants prioritize recognition.

5.2 Response times of the participants

The following participant-dependent research question was investigated: when given two sentences to choose from, what is the difference between each participant's average response time for expected selection than the response time for the other selection? It is hypothesized that the response time of the topic sentences that include the recognized identifiers will be faster than the topic sentences that include unrecognized identifiers.

In terms of response times of the participants, within-subject variations of different items might be plausible for predicting varying response times (Glöckner & Bröder, 2011) on the basis that looking up more cues in a sequential cue search takes longer (Bröder & Gaissmaier, 2007). Multiple cue weighing and single choice discrimination are covered by the same cognitive procedures, allowing processing durations to be predicted (Payne et al., 1988). RH predicts equivalent response times across item types because it uses one cue for discrimination (Glöckner & Bröder, 2011).

It might be concluded from the results that when recognition is the only cue for discriminating, it will take less time to pick recognized things. On the other hand, in case of the availability of extra cues when picking unrecognized items, it will take longer to make a judgment.

To prove that the effect of recognition was not random, the mean response times were examined using a paired t-test with the alternative hypothesis that the true differences in means are not equal to zero. Participants chose recognized items quicker than the alternatives when they were matched with unrecognized or slightly recognized items (RR—UU and RR—SS pairs). When recognized items were the first item in writing instruction (RU—UR pairings), participants picked them faster.

When a recognized item was followed by an unrecognized item, as in a UR—RU pair, participants picked recognized items slower.

In conclusion, the results indicated that subjects make preferential choices based on recognition retrieved from memory. If they recognize one alternative and not the other, then they are likely to infer that the recognized alternative has a higher value. Additionally, a significant conclusion that can be derived from these results is that, when choosing sentences with terms they recognize, novice writers spend less time than when choosing sentences with terms they don't recognize. The most plausible reason for this result is that the participant relies on and employs RH in making a decision. This impact, which would not have occurred if he had been reading and assessing, is attributed to RH in preferential choice studies.

5.3 Limitations of the study

In this study, frequently used inference protocols are employed, relying on strong writing theory. However, as the focus was on decision-making in writing assignments, the participants were provided with topic sentence pairs, rather than single items, which might be a possible confounding factor.

Bereiter and Scardamalia's (1987)'s writing theory is combined with the use of heuristics in writing, therefore, there might be an oversimplification in the process.

The software was designed on ideal distribution in terms of identifiers in recognition tasks which consisted of 50% recognized, 25% slightly recognized, and 25 % unrecognized items, as concluded in pilot studies. Nevertheless, when the data was analysed, unrecognized items were less than expected, with an outcome of the undesired functioning of the software due to being deprived of adequate

unrecognized items. As a consequence, critical pairs (RR-UU) were less than expected, which might be considered as a limiting factor.

5.4 Recommendations and implications for future research

The study contributes to writing research in the following ways. Firstly, it provides a different point of view to writing studies of young learners, which should be practiced within the design of the writing process.

It is clearly seen that the results of most of the past studies indicate that research conducted on writing focuses mainly on writing as a product. However, the mental and cognitive process of students should be taken into consideration in terms of the difficulties the writers, especially novice writers, deal with. On account of this reason, future research should focus on writing as a process rather than a product.

The participants of the study were 4th-grade primary school students, with little or no writing prior knowledge. Therefore, as further research, the recognition heuristics application may be replicated with students who are accustomed to writing tasks in order to examine the possible outcomes of the integration of different participants, from different backgrounds.

The participants are likely to use heuristics strategies and recognition, being the simplest in making decisions under uncertainty when deciding what to write. In the study, the participants were asked to choose among two writing instructions, of which they are likely to write about. As a future research, they may be asked to write about the topics they chose, along with the ones which were not chosen, based on their recognition. A comparison of the participants' writing achievement in terms of selected and non selected topics might be utilized in clarifiying the effects of preference in writing.

Knowing the default decision-making strategies of novice writers, it is possible that they may be supported to make less novice decisions. If novice writers can resolve a yes/no decision, they might be given fast and frugal decision trees, similar to the ones that are used in hospitals and courts to aid the decision-making process. Such decision trees are theoretical designs derived from practice. Perhaps a digital environment might prompt novice writers to consider the proper question at the time of writing, instead of reverting the default knowledge telling strategy.

During the research, the participants' mother tongue was used as a medium of communication, since 4th-grade students are not competent enough in English as a foreign language. A similar study is possible to be conducted in English which might be beneficial in providing a better insight of RH on participants' choice in a foreign language. In line with this, the study might be replicated in speaking skills to reveal the impact of RH on participants' spontaneous lexical choices.

APPENDIX A

RECOGNITION TASK WORD LIST

1. Adet
2. Ahlak
3. Akademik çalışma
4. Akıllı
5. Akılsız
6. Bilgi kuvveti
7. Bilim
8. Bilmek
9. Birey
10. Büyük insan
11. Çevre bilinci
12. Çift dillilik
13. Çocukluk
14. Dahi
15. Değişim
16. Ders seçimi
17. Dış güzellik
18. Dil öğrenme
19. Dinleyerek öğrenme
20. Efsane
21. Eğitim kurumu
22. Erkekler
23. Eşitlik
24. Fikir
25. Firma
26. Galip
27. Gelişim
28. Göç
29. Görüş
30. Grup
31. Hak
32. Hizmet etmek
33. Holding
34. Hoşgörü
35. Hükmetmek
36. Hükümet
37. Iklim
38. İkinci dil
39. İletişim
40. İlişki
41. İnternet
42. İş veren
43. Jimnastik
44. Kalkınma
45. Kamu sektörü
46. Kılıç kuvveti
47. Kızlar
48. Kişi
49. Kişilik
50. Kişilik özellikleri
51. Konser bileti
52. Küçük insan
53. Memleket
54. Mitolojik hikaye
55. Modern bina
56. Mücevher
57. Normal insan
58. Okul hayatı
59. Okuyarak öğrenme
60. Olay

61. Orman
62. Öğrenme metodu
63. Özel sektör
64. Özgürlük
65. Özgürlük/müdahale
66. Para
67. Rehber
68. Sanat
69. Sanayi
70. Savaş
71. Serbest ders
72. Serbest kıyafet
73. Seyahat
74. Sosyalleşmek
75. Spor aktiviteleri
76. Spor Takımı
77. Şehir
78. Tarım
79. Tarihi bina
80. Tecrübesiz
81. Tek tip kıyafet
82. Teknoloji
83. Temel ihtiyaç
84. Toplum
85. Uygarlık
86. Uyum sağlamak
87. Uzay araştırmaları
88. Ülke
89. Yabancı ülke
90. Yakın çevre
91. Yalnızlık
92. Yaparak, yaşayarak öğrenme
93. Yasa
94. Yaşam
95. Yeryüzü
96. Yiyecek/gıda
97. Yüz yüze diyalog
98. Zeki
99. Zorunlu ders
100. Zorunlu

APPENDIX B

RECOGNITION TASK SENTENCE PAIRS

1. (1+12) **Adet**lerimizin topluma **çevre bilinci** kazandırmadaki yeri nedir?

2. (1+17) **Adetlerimiz** neden **değişime** uğrar?

3. (1+17) **Adetlerimizin değişime** uğramasından sorumlu olanlar kimlerdir? Neden?

4. (1+2) **Adet**lerimizin **ahlak** gelişimi ile ilgisi nedir?

5. (1+2) Toplum kurallarını belirleyen **adet**ler midir, **ahlak** mıdır?

6. (1+24) **Adet**ler **eğitim kurumları** aracılığıyla öğrenilebilir mi?

7. (1+84) Bir **toplum**un **adet**lerinin yok olması nasıl sonuçlar ortaya çıkarabilir?

8. (10+12) Her **bireyde çevre bilincini** nasıl oluşturabiliriz?

9. (10+12) Tüm **birey**lerde **çevre bilinci**ni oluşturmak için neler yapılabilir?

10. (10+25) Dünyadaki tüm **bireyler eşit** midir?

11. (10+25) Her **birey eşit** midir?

12. (10+26) **Birey**lerin **fikir**lerine saygı duymalı mıyız?

13. (10+33) **Birey**ler **hakl**arını korumayı neden öğrenmek zorundadır?

14. (11+50) Tarihteki **büyük insanlar**ın ortak **kişilik özellikleri** nelerdir?

15. (11+65) **Büyük insan**, **para**sı olan insan mıdır?

16. (11+70) **Büyük insanlar**a sadece yaşlarından ötürü **saygı** duymak ne derece mantıklıdır?

17. (12+15) **Çevre bilinci** neden **çocukluk** döneminde kazanılmalıdır?

18. (12+38) Küçük yaşta kazandırılan **çevre bilinci iklim** değişikliğinin önüne geçebilir mi?

19. (12+90) **Çevre bilinci** gelişmiş bir insan **yakın çevresine** nasıl faydalar sağlayabilir?

20. (13+10) **Çift dillilik birey**lerin düşünce yapısını etkiler mi?

21. (13+89) **Çift dill**i olmak **yabancı ülke**lere açılmak için şart mıdır?

22. (14+2) **Çocuklar ahlak** eğitimini ilk ailede mi almalıdır?

23. (14+21) Küçük **çocuklar** en çok **dinleyerek öğrenir**.

24. (14+26) **Çocukların fikirlerine** değer verilmeli midir?

25. (14+35) Neden **çocuklara** karşı daha **hoşgörülü** olmak gerekir?

26. (14+40) **Çocuklarla iletişim** kurarken nelere dikkat edilmelidir?

27. (14+43) **Çocuklar** için **kahvaltı** neden önemlidir?

28. (14+5) **Çocuklar anne babaları** ile aynı düşüncede olmadıklarında ne yapmalılar?

29. (14+5) **Çocuklarına** iyi **anne baba** nasıl olunur?

30. (14+56) **Çocuklar okul hayatlarında** ne tür zorluklarla karşılaşırlar?

31. (14+58) **Çocuklar okuyarak mı öğrenirle**r?

32. (14+61) Her **çocuğun öğrenme metodu** farklıdır. Bu farklılık öğrenmeyi nasıl etkiler?

33. (14+65) Aileler **çocuklarını** sadece **para** ile mutlu edebilirler mi?

34. (14+81) **Çocukların teknolojik** aletlerle çok zaman geçirmelerinin yarar ve zararları neler olabilir?

35. (14+92) **Çocuklar** en çok **yaparak ve yaşayarak mı öğrenir**?

36. (14+94) **Çocuklar yaşamın** eğlencesi midir?

37. (15+28) **Çocukluk** dönemindeki **gelişim** nasıl olumlu yönde olabilir?

38. (15+28) **Çocukluk gelişimin** ilk ve en önemli aşamasıdır.

39. (15+73) **Çocukluğunuza seyahat** edebilseydiniz hangi güne giderdiniz? Neden?

40. (16+31) **Dahi** insanların **görüş** açıları diğer insanlardan hangi açıdan farklıdır?

41. (16+98) **Dahi** insan ve **zeki** insan arasındaki farklar neler olabilir?

42. (17+26) Her **değişim** bir **fikirle mi** başlar?

43. (17+28) **Değişim** ve **gelişim** birbirlerini nasıl tamamlar?

44. (17+85) **Değişim**e ne kadar çabuk uyum sağlarsak o kadar **uygar** mı oluyoruz?

45. (18+100) **Ders seçimi**nin bir **zorunluluk** olması çelişki yaratır mı?

46. (18+14) **Ders seçiminde çocukların** söz hakkı olmalı mıdır?

47. (18+56) Doğru **ders seçimi okul hayatı**mızı nasıl olumlu yönde etkiler?

48. (2+1) **Ahlak** bilgimizde **adetl**erimizin etkileri neler olabilir?

49. (2+10) Güzel **ahlaklı birey** olmak neden önemlidir?

50. (2+19) Güzel **ahlak** mı daha önemlidir, yoksa **dış güzellik** mi?

51. (2+25) **Ahlak**lı insanlar herkese **eşit** mi davranır?

52. (2+3) Güzel **ahlak**lı olmak **akıllı** olmaktan daha iyi midir?

53. (2+35) **Ahlak**lı insanlar daha **hoşgörü**lü midir?

54. (20+21) **Dil dinleyerek öğrenilebilir** mi?

55. (20+21) **Dinleyerek dil öğrenilebilir** mi?

56. (20+55) Yabancı **dil okulda öğrenilir** mi?

57. (20+89) **Dil öğrenme**k için **yabancı bir ülke**ye gitmek gerekli midir?

58. (21+22) **Dinleyerek öğrenme** en iyi **eğitim** yöntemi midir?

59. (22+20) **Eğitimde dil öğreniminde** karşılaşılan zorluklar nelerdir?

60. (22+25) **Eğitimde eşitlik** nasıl sağlanır?

61. (22+25) **Eğitimde** tüm öğrencilere **eşit** imkan sağlamak için neler yapılabilir?

62. (22+42) **Eğitimde internet** kullanımı konusunda neler düşünüyorsunuz?

63. (22+68) Bazı çocuklar **eğitim** görmek yerine **sanayide** çalışmak zorunda kalması hakkında ne düşünüyorsunuz?

64. (22+98) **Eğitimde** iyi olanlar en **zekiler** midir, en çalışkanlar mı?

65. (24+2) **Erkekler** neden **ahlak**lı ve terbiyeli olmalıdır?

66. (24+47) **Erkekler ve kızlar** arasında ayrım neden vardır?

67. (24+47) **Erkekler ve kızlar** arasında ayrımcılık yapılmamalıdır.

68. (26+3) İyi bir **fikir akıllı** insandan mı çıkar?

69. (26+33) **Fikirlerimizi** söyleme **hakkımızın** olmadığı bir dünya nasıl olurdu?

70. (26+35) Farklı **fikirlere hoşgörü**lü olmalı mıyız?

71. (26+63) Herkes **fikrini** söylemekte **özgür** müdür?

72. (26+63) İnsanlar **fikirl**erini **özgürce** söylemeli midir?

73. (26+70) Herkesin **fikrine saygı** duyulmalı mıdır?

74. (28+9) Bir konuda **gelişim** sağlayabilmek için sadece **bilmek** yeterli midir?

75. (28+90) İnsanların **gelişimi** konusunda **yakın çevrenin** nasıl etkileri olabilir?

76. (29+57) Çok gezen mi daha çok bilir yoksa çok okuyan mı?

77. (3+26) **Akıllı** insan nasıl daha çok **fikir** üretir?

78. (3+26) **Akıllı** insanlar **fikir** alışverişi yaparlar.

79. (3+4) **Akıllı** insanlar **akılsız** insanlara neler öğretebilirler?

80. (3+7) **Akıllı** insanlar kaba kuvvete başvurmazlar, **bilgi kuvveti** ile sorunlarını çözerler.

81. (30+17) **Göç**lerin toplumda sebep olabileceği **değişim**ler nelerdir?

82. (30+78) **Göç** ve **tarım** arasında nasıl bir ilişki vardır?

83. (31+33) İnsanlar her **görüşlerini** söyleme **hakkına** sahip olmalı mıdır?

84. (32+29) **Grup** halinde **gezmenin** olumlu ve olumsuz yönleri nelerdir?

85. (34+36) Demokratik toplumlarda **hizmet etmeyen hükmedebilir** mi?

86. (35+91) **Hoşgörülü** olmayan insanlar toplum tarafından **yalnızlığa** mı itilir?

87. (37+38) **Hükümetler iklim** kriziyle baş edebilmek için neler yapmalıdır?

88. (38+30) **İklim**in **göç**e olan etkilerini anlatan bir kompozisyon yazınız.

89. (38+78) **İklim** ve **tarım** arasındaki ilişkiyi bir kompozisyon şeklinde yazınız.

90. (39+9) **İkinci bir dil bilmenin** avantajlarını anlatan bir kompozisyon yazınız.

91. (39+97) **İkinci dil**de **yüz yüze diyalog** kurarken ne gibi zorluklar yaşarız?

92. (4+26) **Akılsız fikir** mi, fikirsiz akıl mı daha tehlikelidir?

93. (40+82) Günümüzde **iletişim** için **telefonun** önemini anlatan bir kompozisyon yazınız.

94. (40+97) **İletişim**de **yüz yüze diyaloğun** avantajlarını anlatan bir kompozisyon yazınız.

95. (41+35) **İlişki**lerde **hoşgörü** ne kadar önemlidir?

96. (42+14) **İnternet çocukları** nasıl etkiler?

97. (42+40) **İnternet**in **iletişim** alanındaki katkıları nelerdir?

98. (42+41) **İnternet** insan **ilişkilerini** nasıl etkiler?

99. (42+41) **İnternet** üzerinden sosyal **ilişkiler** kurmak tehlikeli midir?

100. (42+50) **İnternet** kullanımı insanların **kişilik özelliklerini** nasıl etkiler?

101. (42+74) **İnternet** bağımlılığı **sosyalleşmeyi** etkiler mi?

102. (42+91) **İnternet** insanları **yalnız**laştırır mı?

103. (42+97) **İnternet** insanlar arasındaki **yüzyüze diyaloğu** azaltır mı?

104. (43+28) **Kahvaltı**nın **gelişim** üzerindeki etkileri nelerdir?

105. (43+38) **Kahvaltı**da yediklerimiz üzerinde **iklimin** etkisi nedir?

106. (43+56) **Kahvaltı** yapmanın **okul hayatı** ile ilgisi nelerdir?

107. (43+94) **Kahvaltının yaşamımızdaki** önemi nedir?

108. (44+10) Milletlerin **kalkınma**sı **birey**lerin birlik ve beraberliğine mi bağlıdır?

109. (45+72) **Kamu sektörü**nde çalışanların **serbest kıyafe**t giymelerinde ne gibi kısıtlamalar olmalıdır?

110. (46+7) Savaşlarda **kılıç kuvveti** kadar bilgi kuvveti de önemlidir.

111. (46+85) **Kılıç kuvveti** çok güçlü olmasına rağmen bazı **uygarlıklar** yıkılmışlardır. Bunun sebepleri neler olabilir?

112. (47+19) **Kızlar** için **dış güzellik** önemli midir? Neden?

113. (47+2) **Kızlar neden ahlaklı** ve terbiyeli olmalıdır?

114. (48+83) **Kişinin temel ihtiyaçları** nelerdir?

115. (48+91) **Kişi yalnız** yaşayabilir mi?

116. (48+92) **Kişi** en çok **yaparak yaşayarak mı öğreni**r?

117. (5+1) **Anne baba** çocuğuna **adetl**erini öğretmeli midir?

118. (5+12) **Çevre bilinci**nin oluşması **anne baba**nın tavrı ile doğru orantılıdır.

119. (5+14) **Anne babalar çocuklarına** nasıl davranmalıdır?

120. (5+14) **Anne babalar çocuklarının** sorunlarını çözmelerine nasıl yardımcı olmalıdır?

121. (5+48) **Anne babalarımız** bizi en çok seven **kişil**er midir?

122. (50+6) **Kişilik özellikleri**nin oluşmasında okul dönemindeki **arkadaşlık**ların önemini nedir?

123. (50+70) Herkesin **kişilik özelliklerine saygı** duymalı mıyız?

124. (52+30) İnsanlar neden **memleketlerinden göç** ederler?

125. (52+30) **Memlekt**inde yaşamayı mı tercih edersin yoksa sürekli **göç** etmeyi mi?

126. (52+34) **Memleketine hizmet etmek** isteyen insanların prensipleri neler olmalıdır?

127. (53+78) **Modern bina**ların yapılabilmesi için **tarım** alanlarının yok edilmesi ne gibi sonuçlara yol açacaktır?

128. (53+79) **Modern bir binada** mı yaşamak isterdiniz, **tarihi bir binada** mı?

129. (53+81) **Modern bina**ların yapımında **teknoloji** ne gibi faydalar sağlar?

130. (54+3) **Normal insan akıllı** mıdır?

131. (55+17) **Okul değişimi** öğrenci ders başarısını nasıl etkiler?

132. (55+22) **Okullar eğitim** aldığımız yerlerdir.

133. (55+28) **Okullar** bizi **geliştirir** mi?

134. (55+72) **Okula serbest kıyafetle** gitmek bize ne sağlar?

135. (55+75) Her **okulda spor aktiviteleri** bulunmalı mıdır?

136. (55+80) **Okullarda** neden çoğunlukla **tek tip kıyafet** tercih edilir?

137. (55+82) Öğrencilerin **okula telefon** getirmeleri konusundaki düşünceleriniz nelerdir?

138. (55+86) Yeni bir **okula** geç **uyum sağlamanın** sebepleri neler olabilir?

139. (55+86) Yeni bir **okula uyum sağlamak** neden zordur?

140. (55+9) **Okula** gitmek **bilmeyi** öğrenmek mi demektir?

141. (56+17) **Okul hayatını** değiştirebilseydin ne tür **değişimler** ortaya çıkardı?

142. (56+28) **Okul hayatı** bizi **geliştirir** mi?

143. (57+100) **Okumak zorunluluk** mudur?

144. (57+26) **Okumak**, farklı **fikir**leri öğrenmektir.

145. (57+63) **Okumak özgürlüğe** uçmaktır.

146. (57+7) **Okumak bilgi kuvvetini** arttırır mı?

147. (58+81) **Okuyarak öğrenmek teknoloji** ile öğrenmekten daha iyi midir?

148. (6+15) **Çocukluk** yıllarında başlayan **arkadaşlık**lar daha sağlamdır.

149. (6+41) **Arkadaşlık ilişkilerimizde** en çok neye önem vermeliyiz?

150. (6+41) **Arkadaşlık ilişkilerinin** karakterimize etkileri nelerdir?

151. (60+88) **Ormanlık** alan açısından çok zengin bir **ülke** olmamıza rağmen şehirlerimizde neden yeşil alan yok?

152. (60+94) **Ormanlar** sağlıklı **yaşamın** temelidir.

153. (60+94) **Ormanların yaşamımıza** katkıları nelerdir?

154. (63+33) **Özgürlük hakkımızın** elimizden alındığı bir dünya nasıl olur?

155. (63+94) **Özgür** bir **yaşam** için neler yapmalıyız?

156. (63+94) **Özgür yaşam** en büyük hediyedir.

157. (64+93) Yasalar özgürlüklere müdahale eder mi?

158. (65+34) **Para** verdiğimiz herkes bize **hizmet etmeli** midir?

159. (65+6) **Para** ile **arkadaşlık** satın alınabilir mi?

160. (65+63) **Para** ile **özgürlük** satın alınabilir mi?

161. (65+70) İnsanların **paraya saygı** duymasını nasıl açıklarsınız?

162. (65+83) **Para temel ihtiyaçlar** gibi pek çok şeyi satın alabilir ama bazı şeyleri asla.

163. (65+84) **Para toplum**u nasıl etkiler?

164. (66+88) **Rehber** olmak birçok **ülkeyi** görebilmek anlamına mı gelir?

165. (67+65) **Sanat** eserlerinin **para** ile satın alınması konusundaki düşünceleriniz nelerdir?

166. (67+70) **Sanata saygı** duyulmalı mıdır, neden?

167. (67+94) **Sanat yaşamı** renklendirir mi?

168. (68+60) **Sanayi**nin gelişmesi ile **orman**ların yok olması arasındaki ilişki nasıldır?

169. (68+65) **Sanayi para** kazanmak için midir?

170. (69+63) **Savaş**lar insanların **özgürlük**lerini hangi açılardan etkiler?

171. (69+7) **Savaş**ları, **bilginin kuvveti**ni kullanabilenler kazanır.

172. (69+70) **Savaşta saygıya** yer var mıdır?

173. (7+46) **Bilgi kuvveti** mi galip gelir yoksa **kılıç kuvveti** mi?

174. (7+98) **Bilgi kuvveti zeki** insanda daha fazla mıdır?

175. (70+50) **Saygılı** olmak bir **kişilik özelliği** midir yoksa öğrenilebilir mi?

176. (72+63) **Serbest kıyafet** giyince gerçekten **özgür** mü oluyoruz?

177. (72+80) Okullarda **serbest kıyafet** mi yoksa **tek tip kıyafet** mi tercih edilmelidir?

178. (73+20) Yapılan **seyahatler dil öğrenme** sürecini destekler mi?

179. (73+30) **Seyahat** etmek ve **göç** etmek arasındaki farklar nelerdir?

180. (73+30) **Seyahat** ve **göç** arasındaki benzerlikler ve farklılıklar nelerdir?

181. (73+63) **Seyahat** etmek **özgürlük** müdür?

182. (73+74) Sık **seyahat** etmek **sosyalleşmeye** fayda sağlar mı?

183. (73+90) **Seyahat** etmeye **yakın çevre**mizden mi başlamalıyız?

184. (73+94) **Seyahat** ederken kazandığımız deneyimler **yaşam**ımızı nasıl etkiler?

185. (74+10) **Sosyalleşmek birey**i geliştirir mi?

186. (74+19) Bireylerin **sosyalleşme**lerinde **dış güzellik** önemli midir?

187. (75+14) **Spor aktivitelerin**in **çocuklar** üzerindeki etkileri nelerdir?

188. (75+50) Düzenli yapılan **spor aktiviteleri kişilik özelliklerini** nasıl etkiler?

189. (75+74) **Spor aktiviteleri sosyalleşmemizi** sağlar mı?

190. (75+94) **Spor aktivitelerinin** insan **yaşamındaki** önemi nedir?

191. (76+32) Bir **spor takımı**nın başarılı olması **grup** bilinciyle hareket etmelerine bağlıdır.

192. (76+80) **Spor takımları** neden **tek tip kıyafet** kullanmalıdır?

193. (77+73) **Şehirden** şehire gitmek **seyahat** etmek midir?

194. (77+94) **Şehirlerdeki** düzensiz **yaşam** hakkında ne düşünüyorsunuz?

195. (78+60) **Tarım** alanı açmak için **ormanlık** alanları yok edilmesi hakkında ne düşünüyorsunuz?

196. (78+90) Sürdürülebilir **tarım**ın, şehirli insanların **yakın çevre**si üzerindeki önemi nelerdir?

197. (78+95) **Tarım ve yeryüzü** şekilleri arasındaki ilişkiyi kompozisyon şeklinde yazınız.

198. (79+29) **Tarihi binaları gezmek** bizlere neler kazandırır?

199. (79+34) **Tarihi bina**lar geçmişi anlamamıza **hizmet eder mi**?

200. (8+2) **Bilim** için **ahlak** dışı deneyler yapılması hoş görülebilir mi?

201. (8+67) **Bilim** ve **sanatın** insan hayatındaki yeri konusundaki düşünceleriniz nelerdir?

202. (80+100) **Tek tip kıyafetin zorunlu** olması konusundaki düşünceleriniz nelerdir?

203. (80+64) **Tek tip kıyafet** giymek **özgürlüğe müdahale** midir?

204. (80+86) **Tek tip kıyafet** bireylerin ortama **uyum sağlama**sını kolaylaştırır mı?

205. (81+28) **Teknolojinin gelişmesi** yüzyüze diyaloğu nasıl etkilemiştir?

206. (81+40) **Teknoloji**nin bireylerin **iletişim** becerileri üzerine olan etkisini açıklayınız.

207. (81+56) **Teknolojinin okul hayatındaki** yeri konusundaki düşünceleriniz nelerdir?

208. (81+74) **Teknoloji**nin gelişmesi **sosyalleşme**yi ne yönde etkilemiştir?

209. (81+78) **Teknolojinin** gelişmesinin **tarıma** etkileri neler olabilir?

210. (81+83) **Teknolojinin temel bir ihtiyaca** dönüşmesi konusundaki düşünceleriniz nelerdir?

211. (81+84) **Teknoloji bağımlılığı toplum** ilişkilerine nasıl etki eder?

212. (81+84) **Teknoloji** bağımlılığı **toplumu** nasıl etkiler?

213. (81+84) **Teknolojinin toplumdaki** yeri hakkındaki düşünceleriniz nelerdir?

214. (81+90) **Teknoloji**nin gelişmesi ile insanlar **yakın çevrelerinden** uzaklaştılar mı?

215. (81+91) **Teknoloji** bağımlılığı insanı **yalnızlığa** iter mi?

216. (81+94) **Teknoloji yaşam**ımıza olumlu ve olumsuz yönde etki eder.

217. (82+40) **Telefon**lar **iletişim**i kolaylaştırır mı?

218. (82+63) **Telefon** insanlara **özgürlük** mü verir, insanların özgürlüklerini elinden mi alır?

219. (82+83) Günümüzde cep **telefonları** insanların **temel ihtiyaçları** arasında mıdır?

220. (82+83) **Telefon** artık bir **temel ihtiyaç mıdır?**

221. (82+97) **Telefon** kullanımı **yüzyüze diyaloğu** nasıl etkiliyor?

222. (83+22) **Temel ihtiyaçlarımızdan** biri **eğitim** görmek midir?

223. (84+25) **Toplum** içinde **eşitlik** nasıl sağlanabilir?

224. (84+44) **Toplumu kalkındırma** konusunda bireylerin görevleri nelerdir?

225. (84+82) **Toplumun telefonsuz** yaşayamaz hale gelmesindeki en önemli etkenler nelerdir?

226. (84+83) **Toplum** için iletişim **temel bir ihtiyaç** mıdır?

227. (84+83)**Toplumun temel ihtiyaçları** nelerdir?

228. (84+86) İnsanlar **topluma uyum sağlamak** zorunda mıdır?

229. (84+86) **Topluma uyum sağlamak** zorunda mıyız?

230. (85+63) **Uygarlık** tarihinde **özgürlük**lerin neden hep "kazanılması" gerekmiştir?

231. (87+65) **Uzay araştırmalarına** yüksek miktarlarda **para** harcanması doğru mudur? Neden?

232. (87+85) **Uzay araştırmaları** ile yeni **uygarlıkla**r keşfedilmesinin sonuçları neler olabilir?

233. (88+50) **Ülkelere** göre insanların **kişilik özelliklerinin** birbirlerinden farklı olmasının sebepleri neler olabilir?

234. (88+68) Bir **ülke**nin **sanayi**sinin gelişmiş olması, ekonomisinin iyi olduğu anlamına mı gelir?

235. (88+73) **Ülkeler** arası **seyahat** etmek bize neler kazandırır?

236. (88+77) Gezmeye önce farklı **ülkelerden** mi yoksa kendi ülkemizin **şehirlerinden** mi başlamalıyız?

237. (89+52) **Yabancı ülkedeyken memleket** özlemi konusundaki düşünceleriniz nelerdir?

238. (89+86) **Yabancı bir ülkede** yaşama **uyum sağlamak** neden zor olabilir?

239. (89+91) **Yabancı ülkeye** gidenler **yalnızlık** çekerler mi?

240. (91+86) **Yalnız** insanlar topluma **uyum sağlaması** daha mı zordur?

241. (92+21) **Yaparak, yaşayarak öğrenmek, dinleyerek öğrenmekten** daha etkilidir.

242. (92+81) **Yaparak, yaşayarak öğrenmek teknoloji** yardımıyla öğrenmekten daha iyidir.

243. (93+25) **Yasalar** önünde herkes **eşit** olmasaydı hayatımız nasıl olurdu?

244. (94+33) **Yaşam** bir **hak** mıdır yoksa mecburiyet mi?

245. (95+8) **Yeryüzü**nün tahribattan korumamıza **bilim** nasıl yardımcı olabilir?

246. (95+94) Eğer insanlık olmasaydı, **yeryüzündeki yaşam** nasıl olurdu?

247. (97+42) Akrabalar birbirleriyle **yüzyüze mi görüşmeli**ler yoksa **internet** üzerinden mi?

248. (98+16) **Zeki** olan herkes **dahi** olabilir mi?

249. (98+27) **Zeka galip** olmak için yeterli midir?

250. (98+86) **Zeki** insanlar hayata daha çok **uyum sağlarlar**.

APPENDIX C

ETHICAL APPROVAL OF THE SOBETİK

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
Sosyal ve Beşeri Bilimler Yüksek Lisans ve Doktora Tezleri Etik İnceleme Komisyonu

Sayı: 2019-16

18 Nisan 2019

Gülcan Biçer Özdemir
Eğitim Teknolojileri

Sayın Araştırmacı,

"Scaffolding elementary students' written composition with technology to improve the quality of their writing" başlıklı projeniz ile ilgili olarak yaptığınız SBB-EAK 2019/18 sayılı başvuru komisyonumuz tarafından 18 Nisan 2019 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Dr. Öğr. Üyesi İnci Ayhan

Prof. Dr. Feyza Çorapçı

Doç. Dr. Mehmet Yiğit Gürdal

Doç. Dr. Ebru Kaya

Dr. Öğr. Üyesi Şebnem Yalçın

APPENDIX D

PARTICIPANT INFORMATION AND CONSENT FORM

KATILIMCI BİLGİ ve ONAM FORMU

Araştırmayı destekleyen kurum: Boğaziçi Üniversitesi

Araştırmanın adı: Kompozisyon Yazımı Niteliğini Artırmaya Yönelik Acemi Yazarların Yazma Süreçlerinin Desteklemesi

Proje Yürütücüsü: Assist.Prof. Hamdi Erkunt (Tez Danışmanı)

E-mail adresi: erkunt@boun.edu.tr

Telefonu: 0 212 359 73 12

Araştırmacının adı: Gülcan Biçer Özdemir

E-mail adresi: glcnbcr@yahoo.com

Telefonu: 0 5052989252

Sayın Veli,

Boğaziçi Üniversitesi Eğitim Teknolojisi Bölümü yüksek lisans öğrencisi Gülcan Biçer Özdemir "İlkokul öğrencilerinin kompozisyonlarının kalitesini arttırmak için teknoloji ile iskeleleme" adı altında bilimsel bir araştırma projesi yürütmektedir. Bu çalışmanın amacı teknoloji kullanılarak öğrencilerin yazma becerilerini iskeleleme yaklaşımı ile analiz etmek ve geliştirmektir. Çalışma sonunda öğrencilerin kompozisyon yazmalarında gelişim olması beklenmektedir. Müdürünüz okulun bu çalışmaya katılması için izin verdi. Bu araştırmaya yardımcı olmanız için siz velilerin, öğrencinizin araştırmaya katılmasını için onayınızı bekliyorum. Kararınızdan önce araştırma hakkında sizi bilgilendirmek istiyorum**.** Bu bilgileri okuduktan sonra araştırmaya katılmak isterseniz lütfen bu formu imzalayıp kapalı bir zarf içinde bize ulaştırınız.

Bu araştırmaya katılmayı kabul ettiğiniz takdirde öncelikle öğrencilerin var olan bilgilerini ölçmek amacıyla onlara bir ön test verilecektir. Bu testin sonuçları hiçbir şekilde öğrencilerin ders veya karne notlarına etki etmeyecektir. Ayrıca öğrencilerden bir anketi doldurmaları istenecektir. Anket, öğrencilerin demografik bilgileri hakkında sorular içermektedir.

İkinci olarak, öğrenciniz bir eğitim-öğretim dönemi boyunca aktivite saatinde belirli aralıklarla bir bilgisayar programı yardımıyla belli konularda yazma çalışmaları yapacaklardır. Dersler, okulda yürütülecektir ve bu projeler hiçbir şekilde amacının dışında kullanılmayacaktır.

Katılımcı öğrencilere bu çalışmaya katıldıklarını belgeleyen bir takdirname verilecektir. Katılımcı okul müdürü ve öğretmenlerine de bir teşekkür belgesi vereceğiz.

Bu araştırma bilimsel bir amaçla yapılmaktadır ve katılımcı bilgilerinin gizliliği esas tutulmaktadır. Test ve anket sonuçları değerlendirilirken öğrencilerin ismi yerine bir numara kullanılacaktır. Öğrencilerin doldurmuş oldukları test ve anketler araştırma projemiz süresince güvenli bir şekilde muhafaza edilecektir.

Bu araştırmaya katılmak tamamen isteğe bağlıdır. Katıldığınız takdirde çalışmanın herhangi bir aşamasında herhangi bir sebep göstermeden onayınızı çekmek hakkına da sahipsiniz. Öğrenciniz, araştırmadan çekildiği takdirde ders notu vb. gibi herhangi bir nedenden dolayı olumsuz etkilenmeyecektir ve öğrencinizden toplanan veri yok edilecektir. Bu araştırmada farklı okulları veya farklı sınıfları karşılaştırmadığımızı vurgulamak istiyorum. Araştırma projesi hakkında ek bilgi almak istediğiniz takdirde proje yürütücüsü (Ofis Telefonu: 0 212 359 73 12) ile irtibata geçebilirsiniz. Ayrıca araştırma projesi ile ilgili haklarınız konusunda Boğaziçi Üniversitesi İnsan Araştırmaları Etik Alt Kurulu'na danışabilirsiniz (Telefon: 0212-359 6810, Adres: Boğaziçi Üniversitesi, Güney Kampüs, 34342 Bebek, İstanbul).

Eğer bu araştırma projesine katılmasını kabul ediyorsanız, lütfen bu formu imzalayıp kapalı bir zarf içerisinde bize geri yollayın.

Yukarıdaki metni okudum ve istenen çalışmanın kapsamını ve amacını tamamen anladım. Velisi bulunduğum, (katılımcının adı) ....., adlı öğrencimin çalışmaya katılmasını onaylıyorum. Çalışma hakkında soru sorma imkânı buldum. Bu çalışmayı istediğim zaman ve herhangi bir neden belirtmek zorunda kalmadan bırakabileceğimizi ve bıraktığımız takdirde herhangi bir olumsuzluk ile karşılaşmayacağımızı anladım.

Bu koşullarda söz konusu araştırmaya kendi isteğimle, hiçbir baskı ve zorlama olmaksızın katılmayı kabul ediyorum.

Formun bir örneğini aldım / almak istemiyorum (bu durumda araştırmacı bu kopyayı saklar).

Katılımcının Adı-Soyadı: .....

İmzası: .....

Adresi (varsa Telefon No, Faks No): .....

Tarih (gün/ay/yıl): ...../...../.....

Varsa Katılımcının Vasisinin Adı-Soyadı: .....

İmzası: .....

Tarih (gün/ay/yıl): ...../...../.....

KATILIMCI 18 YAŞ ALTI İSE:

Katılımcının VELİSİNİN Adı-Soyadı: .....

İmzası: .....

Tarih (gün/ay/yıl): ...../...../.....

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