# SELF-DETERMINED LEARNING SKILLS AMONG ADULT LEARNERS AND THEIR LEARNING PREFERENCES

AYŞEGÜL DİLAVER YENİER

BOĞAZİÇİ UNIVERSITY

2024

# SELF-DETERMINED LEARNING SKILLS AMONG ADULT LEARNERS AND THEIR LEARNING PREFERENCES

Thesis submitted to the

Institute for Graduate Studies in Social Sciences

in partial fulfillment of the requirements for the degree of

Master of Arts

in

Educational Sciences

by

Ayşegül Dilaver Yenier

Boğaziçi University

2024

Self-Determined Learning Skills among Adult Learners

and Their Learning Preferences

The thesis of Ayşegül Dilaver Yenier

has been approved by:

Assoc. Prof. Bengü Börkan Aydıner _____
(Thesis Advisor)

Assoc. Prof. Havva Ayşe Caner _____

Assist. Prof. Gökçe Güvercin Seçkin _____
(External Member)

September 2024

DECLARATION OF ORIGINALITY

I, Ayşegül Dilaver Yenier, 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

Signature…….

Date……...……..

ABSTRACT

Self-Determined Learning Skills Among Adult Learners

and Their Learning Preferences

This investigation aimed to assess the self-determined learning capabilities of adult learners, all of whom are university graduates engaged in full-time employment, and to explore the patterns in their learning preferences. This study is quantitative research with a correlational design aimed at examining the relationship between adult learners' learning preferences and their scores on the self-determined learning skills scale (SDLSS). The quantitative method will enable statistical analysis to investigate potential connections between variables and understand how learners' learning preferences might impact their ability for self-determined learning. This study involved the distribution of the SDLSS and a learning preferences questionnaire through an online platform to a cohort of 341 adult learners. The analysis was conducted to investigate the correlations between the participants' scores on the SDLSS and various factors, including their study techniques, learning styles, sources of learning, and preferences in self-assessment. It was determined that a significant linkage exists between the SDLSS scores and the learning preference tendencies among adult learners. Given the increasing recognition of self-determined learning, or heutagogy, as a pivotal educational approach for the twenty first century, it is posited that the application of the SDLSS to adult learners and its correlation with their learning preferences can offer substantial contributions to both national and international academic discourses.

# ÖZET

## Yetişkin Öğrenenlerin Öz-Belirlenimli Öğrenim Becerileri ve Öğrenim Tercihleri

Bu çalışmanın amacı, üniversite mezunu olan ve tam zamanlı çalışan yetişkin öğrenenlerin öz-belirlenimli öğrenim becerilerini ölçmek ve yetişkin öğrenenlerin öğrenim tercihleri eğilimlerini incelemektir. Bu çalışma, yetişkin öğrenenlerin öğrenme tercihleri ile öz belirlenimli öğrenme becerileri ölçeği (ÖBÖBÖ) puanları arasındaki ilişkiyi incelemeyi amaçlayan korelasyonel bir tasarıma sahip nicel bir araştırmadır. Nicel yöntem, değişkenler arasındaki potansiyel bağlantıları araştırmak ve öğrenenlerin öğrenme tercihlerinin öz belirlenimli öğrenme becerilerini nasıl etkileyebileceğini anlamak için istatistiksel analiz yapılmasını sağlayacaktır. Bu nicel araştırmada tam zamanlı çalışan, üniversite mezunu ve son bir yıl içerisinde en az bir mesleki gelişim programına katılan 341 yetişkin öğrenen ÖBÖBÖ ve öğrenim tercihleri anketi çevrim içi olarak uygulanmıştır. Araştırma sonuçlarına göre katılımcıların ÖBÖBÖ skorları ile çalışma tekniği, öğrenim stili, öğrenim kaynağı ve öz değerlendirme tercihleri arasındaki ilişkiler incelenmiş ve öz-belirlenimli öğrenim becerileri skoru ile yetişkinlerin öğrenim tercih eğilimleri ilişkilendirilmiştir. Öz-belirlenimli öğrenim-heutagogy 21. yüzyıl için önemli bir öğrenim yaklaşımıdır, bu nedenle ÖBÖBÖ'nin yetişkin öğrenenlerde uygulanması ve yetişkin öğrenenlerin öğrenim tercih eğilimleri ile ilişkilendirilmesinin ulusal ve uluslararası literature önemli katkılar sağlayabileceği öngörülmektedir.

ACKNOWLEDGMENTS

I wish to extend my sincere gratitude to everyone who supported me throughout the course of this study. I am deeply thankful to my advisor, Assoc. Prof. Bengü Börkan Aydıner, for not only offering unwavering support but also for being readily available whenever I needed assistance and for helping me navigate through every obstacle. I am also grateful to my committee members, Prof. Havva Ayşe Caner and Assist. Prof. Gökçe Güvercin Seçkin, for their continuous support and constructive feedback throughout this process.

Moreover, I would like to express my immense gratitude to my esteemed colleagues and family:

My dear mentor, Kerim Gürçay,

My dear friend and colleague, Muhlis Murat Akay,

My dear husband, who is my partner in both business and life, Erkan Yenier,

And my most precious and beloved son, Mehmet Şerif Yenier.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION ..... 1

1.1 Background of the study ..... 1

1.2 Andragogy and heutagogy ..... 4

1.3 Learning styles ..... 6

1.4 Learning resources ..... 7

1.5 Study techniques ..... 9

1.6 Critical reflection ..... 9

1.7 Purpose of the study ..... 10

1.8 Research questions ..... 11

1.9 Significance of the study ..... 12

CHAPTER 2: REVIEW OF LITERATURE ..... 15

2.1 Introduction ..... 15

2.2 Pedagogy ..... 16

2.3 Andragogy ..... 17

2.4 Heutagogy: Self-determined learning ..... 19

2.5 Pedagogy-andragogy-heutagogy continuum ..... 30

2.6 Practical implementations of heutagogy ..... 32

CHAPTER 3: METHODOLOGY ..... 35

3.1 Research design ..... 35

3.2 Participants ..... 36

3.3 Measures ..... 38

3.4 Pilot study ..... 42

3.5 Data collection ..... 43

3.6 Data analysis ..... 44
3.7 Exploratory factor analysis (EFA) ..... 45
CHAPTER 4: FINDINGS ..... 54
4.1 Reliability of the SDLSS scores ..... 56
4.2 Descriptive statistics ..... 60
4.3 Finding about research questions ..... 61
4.4 Analyzes addressed outside of research questions ..... 73
CHAPTER 5: DISCUSSION & CONCLUSION ..... 78
5.1 Key findings ..... 78
5.2 Results and contributions ..... 79
5.3 Limitations ..... 89
5.4 Recommendations for future studies ..... 91
5.6 Conclusion ..... 93
APPENDIX A: ETHICS COMMITTEE APPROVAL ..... 97
APPENDIX B: PARTICIPANT INFORMED CONSENT FORM (EN) ..... 98
APPENDIX C: PARTICIPANT INFORMED CONSENT FORM (TR) ..... 100
APPENDIX D: SELF-DETERMINED LEARNING SKILLS SCALE (EN) ..... 102
APPENDIX E: SELF-DETERMINED LEARNING SKILLS SCALE (TR) ..... 105
APPENDIX F: LEARNING PREFERENCES SURVEY (EN) ..... 108
APPENDIX G: LEARNING PREFERENCES SURVEY (TR) ..... 111
REFERENCES ..... 114

LIST OF TABLES

Table 1. Pedagogy and Andragogy ..... 19

Table 2. Pedagogy Andragogy Heutagogy Continuum ..... 31

Table 3. Eigenvalues of The Data and Parallel Analysis ..... 49

Table 4. Total Variance Values Explain ..... 50

Table 5. Summary of EFA Results ..... 51

Table 6. Correlations Between Factor Scores ..... 53

Table 7. Frequencies and Percentages of The Participants ..... 55

Table 8. Cronbach's Alpha Values ..... 57

Table 9. Cronbach Alpha of Subscales and Total Scale ..... 57

Table 10. Item Analysis ..... 59

Table 11. Descriptive Statistics of The SDLSS Scores ..... 61

Table 12. Learning Preferences Descriptive Statistics (N = 273) ..... 62

Table 13. The Relation Between The SDLSS Scores and Learning Preferences ..... 63

Table 14. Learning Resources Descriptive Statistics (N = 273) ..... 64

Table 15. The Relation Between SDLSS and Learning Resources Preferences ..... 65

Table 16. Study Technics Descriptive Statistics (N = 273) ..... 67

Table 17. The Relation Between SDLSS Scores and Study Technique Preferences 68

Table 18. Self-reflective Activities Descriptive Statistics (N = 273) ..... 69

Table 19. The SDLSS Scores and Self-reflective Activities ..... 70

Table 20. The SDLSS Sub-scores and Self-reflective Activities ..... 72

LIST OF FIGURES

Figure 1. Principles of heutagogy ..... 21

Figure 2. Heutagogy design elements ..... 28

Figure 3. Curriculum assumption sample ..... 29

Figure 4. Double-loop learning ..... 29

Figure 5. Heutagogy design elements (Hase, 2025) ..... 82

# CHAPTER 1

# INTRODUCTION

With advances in technology and competitive work environments, employees are now required to learn while carrying out their work. Organizations expect employees to be self-sufficient and able to take charge of their own learning as part of their professional development. As a result, learning is becoming increasingly the responsibility of individuals and teams rather than being controlled by the organization (Lemmetty & Collin, 2019). Therefore, self-determined learning, where individuals manage their own learning, is crucial not only in education and training but also in the context of workplace learning.

In this study, the self-determined learning skills scale (SDLSS) and a questionnaire on learning preferences (study techniques, learning resources, learning methods, and self-reflection preferences) were given to a group of full-time employees in Türkiye. The study evaluated the relationship between the SDLSS results and the learning preferences' questionnaire, and the conclusions discuss the findings on the sample trends.

## 1.1 Background of the study

The need for a sustainable and innovative learning approach has become increasingly apparent, given the changing learner profiles, the global business world's expectations from employees, training costs, and technological developments. It is widely acknowledged that traditional education methods are inadequate to prepare learners to succeed in modern workplace environments (Hase, 2009). The World Economic Forum's Future of Works Report, which provides a comprehensive

overview of the labor market in the 2023-2027 timeframe, highlights the importance of acquiring global skills. According to the report, it is essential for the continuity of individuals' professional lives that fifty percent of employees develop new skills by 2025 (Whiting & Martin, 2020). The report lists the top ten skills that will be in high demand: active learning and learning strategies; analytical thinking and innovation; complex problem-solving; critical thinking and analysis; creativity, originality, and initiative; leadership and social influence; reasoning, problem-solving, and idea generation; flexibility, stress tolerance, and resilience; technology design and programming; and technology use, monitoring and control reasoning, problem-solving, and idea generation (The Future of Jobs Report 2023, 2023). From these skills, common lifelong learning skills such as learner autonomy, agility, creativity, communication, collaboration, critical thinking, digital literacy, self-efficacy, self-management, and self-regulation emerge (Blaschke, 2019). According to the data presented in this report, today's organizations prioritize employee autonomy and self-motivation, favoring agile operations with reduced hierarchies. Consequently, individuals and teams bear greater responsibility for their own learning. Organizations expect their employees to learn independently, without their intervention. Thus, the ability to engage in self-determined, multidimensional learning is vital for workplace learning (Lemmetty & Collin, 2019).

In today's information society, workplace learning is essential for ongoing professional development and growth due to a variety of factors, including demographic shifts, changing skill requirements, technological advancements, and evolving job descriptions within institutions and communities. According to Vaughan, unlike in the past, the transition from school to working life is no longer a simple and straightforward process. Learning is no longer confined to the traditional

classroom setting, and there are no longer clear guidelines for how to structure one's career path. As a result, ongoing learning and development are critical to success in the modern workforce (Vaughan, 2015).

The emphasis on non-formal and informal learning has been a consistent and significant aspect of professional development for a considerable period of time. Non-formal learning refers to learning embedded in planned activities that are not explicitly defined as learning but contain a vital learning element, such as professional skills acquired in the workplace. Informal learning is defined as learning arising from daily life activities related to family, work, or leisure. Learner autonomy is essential to managing the learner's learning process in both formal and non-formal education.

Given the changing demands of the labor market, the decreasing number of existing learners, decreasing funding, increasing use of technology in the classroom, learner and employer demand for more work-based skills and knowledge, and the Covid-19 pandemic, radical changes are required at all levels of education (Blaschke & Hase, 2021). It is imperative to adapt to these changes and adopt a more innovative and sustainable learning approach to meet the needs of learners and the labor market. So, the development of paradigms related to education and learning, especially in adult education, has increasingly brought learner autonomy to the fore. With the emergence of distance learning technologies, the concepts of self-directed learning (andragogy) and self-determined learning (heutagogy) have received significant attention. Unlike the traditional educator-focused model, these frameworks are based on the learners' proactive role in the educational process (Blaschke & Hase, 2021).

## 1.2 Andragogy and heutagogy

Self-directed learning (andragogy) and self-determined learning (heutagogy) are distinct yet interconnected concepts prioritizing learner autonomy. Andragogy involves learners proactively identifying their educational needs, setting learning goals, and evaluating results within a predefined structure while using significant initiative. This method is primarily compatible with adult learning, based on intrinsic motivation for personal development and the pragmatics of immediate application of knowledge, and requires the learner's participation in predetermined educational goals (Knowles, 1973).

On the other side heutagogy, or self-determined learning, strengthens the autonomy of andragogy and provides learners with extensive control over their educational efforts. Heutagogy approach involves identifying learning pathways, formulating goals, and establishing evaluation criteria, encompassing the meta-competence of learning to learn (Copheutagogy, 2014). This approach is suitable for equipping individuals with the adaptive competencies required in the fluid and unpredictable contemporary professional environment (Copheutagogy, 2014). Within the heutagogy approach, the role of the educator is redefined from guiding to supportive, from setting specific learning trajectories to providing resources and scaffolding (Copheutagogy, 2014). Self-directed learning, on the other hand, relates to people's ability to manage their learning and know where to find resources (Knowles, 1973).

The difference between self-determined learning and self-directed learning lies in the degree of autonomy given to the learner. While self-directed learning provides a certain level of autonomy, heutagogy takes it a step further by empowering learners to take control of their own learning. This approach is

particularly relevant in today's rapidly changing professional landscape, where individuals are expected to be equipped with the adaptive competencies necessary to navigate an unpredictable environment (Canning & Callon, 2010). Educators who adopt self-determined learning approach must shift their role from that of a guide to a supporter, providing learners with the resources and scaffolding necessary to facilitate their self-determined learning (Ashton & Newman, 2006).

Self-determined learning (heutagogy) is a multifaceted structure reflecting an individual's learning skills. Heutagogy and andragogy encompass, to varying degrees, motivational aspects, strategic planning abilities, self-monitoring competence, and practical communication skills in learning contexts. Cheng's work in 2010 clarified these components, highlighting the importance of intrinsic motivation and metacognitive skills in developing self-directed learning (Su-Fen Cheng, 2010). This readiness is considered an essential determinant of educational outcomes in university settings and facilitates the acquisition of knowledge and skills necessary for lifelong learning. In 2013 Guglielmino expands on this issue further and emphasizes that autonomous learning ability is crucial in a rapidly developing information environment (Nadi & Sajjadian, 2012). Guglielmino is argued that developing self-directed learning and self-determined learning skills is essential for academic success and a core competency for continuing professional development, these competencies should be developed during formative educational stages, such as high school or higher education, to prepare individuals for the complexities of the professional world (Nadi & Sajjadian, 2012). According to Stewart Hase, one of the researchers and developers of heutagogy, self-learning is not something we do to people; they are learners who make their own decisions by nature from birth

(Copheutagogy, 2014). What self-determined principles advocate is creating the optimal experience and environment for people to become self-determined learners.

So, the purpose of this study is to investigate the necessary self-determined learning skills needed for heutagogical practices within adult learners. Additionally, the study aims to explore the learners' preferred learning styles, their most favored learning resources, study techniques, and critical reflection preferences.

### 1.3 Learning styles

Learning styles suggest that individuals have different preferences in how they learn or work most effectively (Pashler et al., 2008). A lot of research claims that to maximize learning outcomes, it is important to identify individuals' learning styles and then adjust learning strategies according to these preferences. Usually, learning styles research ask individuals to indicate their preferred method of receiving information (e.g., textual, visual, or auditory) and/or their preferred cognitive activities such as auditory processing versus analytical tasks.

Learning styles have become significantly important in the field of education, impacting teaching practices from early childhood education to adult learning contexts. So, the research of learning styles is a widely researched topic, but no universally accepted tool or scale exists. In the studies conducted, the most recommended tools for classifying learning styles are the Myers-Briggs Type Indicator, David Kolb's Learning Style Inventory, and Torres' Language System Diagnostic Instrument (LSDI). The Myers-Briggs tool is a self-report questionnaire that assesses psychological preferences in how people perceive the world and make decisions. Kolb's Learning Style Inventory (Kolb, 1985) groups learners into four different types and views learning as a four-stage cycle that includes concrete

experience, reflective, and reflective experiences. The Learning Style Inventory instrument identifies the student's primary, secondary, and tertiary language representation systems between visual, auditory, and kinesthetic. According to previous studies, a learner's learning style determines their learning preferences. Lee and his colleagues conducted a study in 2000 to determine which of four commonly used activities in learning were preferred by adult part-time graduate students and whether these preferences varied according to learning style and field of study (Lee et al., 2000). The four activities in the questionnaire were lectures, classroom discussions and reflections, individual projects, and a project of the learners' own choosing.

In this study, a questionnaire was developed and administered to understand adult learners' preferences for learning styles classified into four different groups by Lee et al. The research conducted by Lee et al. will provide a basic framework for understanding the learning dispositions of adult learners participating in this study.

### 1.4 Learning resources

Learning resources, including textbooks, multimedia content, online tools, and interactive materials, enable learners to access information through various formats. These resources address to different learning preferences, allowing individuals to access materials that are most effective for their learning process (Mayer, 2014). Digital learning resources empower learners to progress at their own pace and to explore topics of interest beyond structured learning programs. This fosters self-directed learning and helps individuals cultivate lifelong learning skills. Personalized learning resources significantly impact learner engagement and motivation, as

individuals are more likely to actively engage with materials that interest them (Knowles, 1973).

In summary, this study aims to investigate the link between individuals' SDLSS and their preferences for learning resources. Considering the diverse backgrounds and experiential reservoirs characterizing adult learners, this analysis comprehensively spans individual characteristics, technological considerations, and content relevance within the context of educational resources. Adult learners, exhibiting a spectrum of learning styles, manifest distinct preferences for diverse mediums such as texts, videos, podcasts, and expert-led content. Motivational factors, notably intrinsic motivations and goal orientation, exert discernible influence on the nuanced landscape of resource choices (Deci & Ryan, 1985) Additionally, technological considerations encompass preferences for online or offline materials, coupled with the imperative of addressing accessibility concerns (Bates, 2015).

Moreover, the salience of content relevance to real-world applications emerges as a paramount guiding criterion in the discernment and selection of learning resources (Knowles et al., 2015). As educators and instructional designers seek to optimize resource delivery strategies, considerations involve incorporating diverse resource formats, prudent leveraging of technology, and the diligent assurance of practical applicability. This comprehensive understanding, underpinned by scholarly research and pedagogical theories, augments the informed design and implementation of learner-centered environments that empower adult learners through a judicious amalgamation of texts, search engines, videos, expert-led discourse, podcasts, and engagement via social media channels.

## 1.5 Study techniques

In a 2013 study by Dunlosky and his colleagues, the effectiveness of ten standard learning techniques used by university students was examined (Dunlosky et al, 2013). The techniques were evaluated based on their usefulness and effectiveness on students' grades across different courses and students. The study found that practices like summarizing, concept studies, re-reading, and using visuals provided limited benefits, although they were still linked to learning. Another study by Leutner in 2009 found that students who use creative imagery and visuals to learn tend to perform better (Leutner et al., 2009). However, such studies are primarily conducted on students, and there is limited research on adult learners. This study seeks to explore the learning technique preferences of adult learners, and the scales used in this study will be examined in detail. Additionally, educators will be asked about their preferences for learning techniques using the Linkert style. The results of this study will provide valuable insights into the use of study techniques in adult education and how they should be recommended and implemented by learners, instructors, and content developers.

## 1.6 Critical reflection

Being a critical reflector is considered essential for many learners. It can aid in professional development by evaluating decisions and actions, leading to improvements in the learning process (Brookfield, 1987; Mezirow, 1994). Reflective practice, especially in the heutagogical approach, has been found to help learners gain more control over their learning and comprehend and apply what they have learned in practical situations (Blaschke, 2012). Research indicates that reflective techniques, like critical portfolios and reflective diaries, can help students

consolidate and evaluate their learning of a discipline and its practices (Mezirow, 1994). This study explores the relationship between adult learners' preferences for reflective techniques and their self-determined learning scores.

Elizabeth Smith's 2011 study on reflective techniques for health education identified several methods for reflective learning, including reflective writing, reflective summary, diagrammatic representation, creative representation, perspective-taking, and interaction (Smith's, 2011). One of the most critical elements of heutagogy is the learners' evaluation of their own learning process. Therefore, it is essential to understand which techniques adult learners prefer to evaluate their learning and their tendencies. This understanding is crucial for both learning and including these techniques in their learning designs.

## 1.7 Purpose of the study

Due to rapidly developing technology and increasing data, lifelong learning has become more critical than ever. Continuing the professional development of people in professional life has become one of the most sought-after features in every sector. Considering these developments, different learning methods have been developed, and it has been a priority for individuals to gain the skills to manage their learning path. Three approaches were adopted in the approach to learning-teaching processes: pedagogy, andragogy, and heutagogy, which differentiated the roles of teacher and learner. These approaches differ depending on how the learner and the instructor are positioned in the learning process rather than the biological age of the learner. Considering the twenty first century resources, the ideal form of learning suitable for the age is heutagogy (Copheutagogy, 2014). Heutagogy is an approach in which the individual can draw his/her own learning road map. The learner is an active and

decision-maker at every step, from learning planning to the measurement and evaluation process. Although heutagogy is a new field of research in recent years, research has been concentrated on k12 level and university students. Studies in adult education regarding this approach, which is vital for lifelong learners in professional development, are limited in Türkiye. Therefore, research studies need to be conducted to determine self-determined learning skills in adults and to develop these skills. In this sense, this research aimed to apply the SDLSS and evaluate total score obtained from a measurement for adult participants.

Besides, the study aims to investigate the relationship between the SDLSS of adult learners and their preferences for learning resources, study techniques, critical reflection activities, and learning styles. Through this investigation, the study aims to uncover valuable insights into how individuals approach learning. It could reveal the correlation between specific self-determined learning skills and the best resources or methods. This exploration could also shed light on which resources and practices align with self-determined learning styles, providing a deeper understanding of how adults can effectively acquire knowledge and skills.

The study results can be utilized by adult learners, program designers, and instructors to design and implement effective learning strategies. The findings of this study can serve as a roadmap for adult learners who aspire to become independent learners by providing them with an in-depth understanding of various learning approaches and study techniques.

## 1.8 Research questions

This quantitative study implements the SDLSS to evaluate diverse adult learners' self-determined learning skills. In addition, with correlational research, the

relationship between the SDLSS of adult learners and their learning styles, learning resources, study techniques, and critical reflection preferences will be examined. This study aims to explore specific research questions, which are outlined below:

1. To what extent is there a relationship between learners' style preferences of adult learners and their scores on the self-determined learning skills scale?
2. To what extent is there a relationship between the learning resource preferences of adult learners and their scores on the self-determined learning skills scale?
3. To what extent is there a relationship between the study technique preferences of adult learners and their scores on the self-determined learning skills scale?
4. To what extent is there a relationship between adult learners' preferences for reflective activities and their scores on the self-determined learning skills scale?

## 1.9 Significance of the study

With the emergence of new generation learning tools, new learning approaches have begun to be studied in addition to existing traditional learning theories. Heutagogy is one of the newest learning approaches offered to help learners take responsibility for and manage their own learning. So, this study is crucial as it aims to apply the SDLSS to various professional groups, contributing to both national and international literature. Various scales have been developed to measure heutagogy skills and tendencies in adults and are available in international publications. Some examples include the Instrument of Heutagogical Teaching and Learning Activities Questionnaire (Jailani, 2020), Perception of Heutagogically Professional Learning (Miller et al., 2021), and Self-Driven Learning Readiness Scale (Torabi et al., 2013). These scales have predominantly been applied to university students, master's students, and educators. A potential contribution to the existing literature could be

made by measuring self-determined learning skills scores of professional adults actively engaged in full-time jobs across diverse sectors. Examining the correlation between skills and various factors such as learning styles, available learning resources, study techniques, and the tendency towards critical reflection preferences could provide valuable insights into this domain.

Although research on heutagogy has increased in recent years, research in Türkiye, especially in the field of adult education, is quite limited. Studies by Oktay (2021), Ceylan (2019), Dulkadir & Yaman (2018) focused on distance learning processes and independent learning, which have increased with technology. Hence, when it comes to heutagogy, national literature has certain limitations. Nevertheless, in 2023, Şahin Sargın and Güvercin Seçkin's development of the SDLSS in Turkish opened avenues for further research. The scale comprises four subcategories (learning to learn, learner autonomy, self-motivation, self-direction) and 22 items. The scale's reliability and validity tests were carried out on 574 university students. In this study, the scale will be conducted on full-time adult learners from various occupational groups, and the results will provide valuable contributions to the literature for a conceptual framework and practical value.

In addition, this study will contribute to the literature by analyzing how self-determined learning skills correlate with different learning styles and strategies employed by adults. It explores how self-determined learning skills relate to adult learning processes, such as learning styles, reflective practices, study habits, and preferences for learning resources. This study will hope to valuable insights into how adult learners navigate and construct their educational experiences.

The research will also enhance our understanding of how reflective practices facilitate self-determined learning skills, which is essential given the increasing

emphasis on reflection in professional learning contexts. Although similar studies focused on specific groups such as nurses (Green & Huntington, 2017), adults with special needs (Friedman & Nash-Luckenbach, 2023), etc., academic studies applied to a diverse group are limited. By discerning the relationship between self-determined learning skills and study practices, the research could offer valuable strategies for adult learners to optimize their study approaches and improve their educational outcomes.

Moreover, this study will assess learning resource preferences concerning self-determined learning skills. This will inform the design and selection of learning materials and resources that align with self-determined learning paradigms, thereby supporting more effective adult learning. This study's findings can influence adult education policy, instructional design, and professional development programs, ultimately fostering an educational environment that is more conducive to the principles of heutagogy and lifelong learning.

By bridging this regional research gap, the study contributes meaningfully to enhancing adult learning theories and practices, advocating for education systems that recognize and harness the full potential of self-determined learning strategies in pursuing lifelong learning and professional development in a Turkish context. The acquisition of data from the study is deemed important in terms of generating insights into the learning patterns that are essential to transforming adults into lifelong learners who proactively assume responsibility for their own learning. The outcomes of this research have the potential to be beneficial for adult learners, educational institutions, instructional designers, educators, and organizations that prioritize the professional development of their workforce.

# CHAPTER 2

# REVIEW OF LITERATURE

## 2.1 Introduction

In this chapter, pedagogy, andragogy, and heutagogy are discussed as learning approaches for adult learners. Heutagogy is then analyzed in terms of its design elements and basic principles. Furthermore, studies on the learning preferences of adult learners are reviewed, and the items that need to be addressed are identified and analyzed.

Global demographic expansion increasing demand for educational services exceeds the capabilities of traditional solutions, such as the expansion of physical education infrastructure or the proliferation of teaching staff. It is essential to replace these approaches with an improvement in educational efficiency. Classroom methodologies and educational resources, including these learning resources, require significant improvements to meet contemporary educational needs effectively (Skinner, 1958). Skinner developed an instant feedback system using developing technology to meet this need, which he identified in 1958, and tried to put the learner at the center of the education process (Skinner, 1958). Afterward, robust learning approaches in which the learner element is at the forefront were studied, especially humanism (Carl Rogers, 1969) and constructivism (Vygotsky, 1978) are the strongest of these approaches (Blaschke et al., 2014). In 2001, Chris Kenyon and Stewart Hase presented heutagogy, in which the human agency is at the center, by saying it is a natural advancement from earlier educational methodologies and may furnish the optimal strategy for learning in the twenty first century.

In parallel with these developments, the increasing maturity of technological resources has introduced a multitude of audiovisual aids complemented by adaptive feedback systems that are always accessible. These advances are crucial in promoting individualized learning trajectories and thus meeting individual learners' different educational needs and rhythms.

In the literature review part of the study, we will focus on the fundamental tenets of heutagogy and descriptions of the basic principles (human agency, capability development, self-reflection/metacognition, double-loop learning, and non-linear learning) (Blaschke, 2016). In addition, learning approaches affected by heutagogy, predominantly the continuum of pedagogy, andragogy, and heutagogy (PAH), will be discussed. The self-reflective approach will also be included, which is very consequential for individuals who learn and take responsibility for learning. Finally, the practical implementation of the essence of heutagogy in adult education and studies in Türkiye will also be discussed.

## 2.2 Pedagogy

The word "pedagogy" is rooted in Ancient Greek culture and has been adapted from Latin and French (Watkins, 1999). In ancient Greece, people who were responsible for educating children (usually boys) from wealthy families were called "paid-agogus." The term comes from the word "pais", which is commonly used for boys, and "agogus" meaning leader, thereby "pais-agogus" refers to the teacher (Knowles, 1973). Additionally, the word "pedagogy" comes from the French "pédagogie" and the Latin "paedagogia", both with similar meanings. In modern times, pedagogy refers to the conscious activities of one person to teach or help another person learn (Jones et al., 2019). Over time, the concept of pedagogy has become more complex

and interrelated as the process of transferring knowledge from an expert to a novice has become more challenging. The main reasons for this difficulty are the differentiation between compulsory education and informal education, the abundance of knowledge resources, and the large class sizes (Watkins, 1999). However, even though knowledge transfer is still important, the acquisition of new skills and knowledge with the help of technology has become significant, and learning how to learn has become a critical skill to be taught. Furthermore, inflation and the rapid development of technology make knowledge obsolete quickly, resulting in the need for constant updates. Therefore, education is no longer just about transferring knowledge and skills but also about learning how to learn, which encompasses lifelong inquiry (Knowles, 1988).

## 2.3 Andragogy

Andragogy refers to the practice of adult learners taking greater responsibility for their learning outcomes and developing independent learning skills, distinct from traditional pedagogical approaches (Jones et al., 2019). The term was first used by Alexander Kapp, a high school teacher, in 1833. Although the origins of the term are unclear, it is often attributed to Kapp's reference to adult education in his book (Reischmann, 2004). However, it was Malcolm Knowles who made the most significant contribution to the development of the concept of andragogy, Knowles believed that adult education must be demand-oriented and responsive to the needs of learners (Knowles, 1988). According to his philosophy, adult learners should be empowered to take responsibility for their learning experiences. This approach was based on three fundamental assumptions: the learner's experience, readiness, and meaningful learning (Jarvis, 2001). Unlike pedagogy, which is instructor-centered,

andragogy on emphasizing on the learner's experience and needs. In contrast to pedagogy, which assumes that learners are ready to learn at the same age and time, andragogy assumes that learners are ready when they need to learn. Additionally, andragogy promotes acquiring skills and competencies that immediately apply to the learner's needs (Knowles, 1988).

Despite Knowles' contributions, the distinction between andragogy and pedagogy has been the subject of academic debates. McKenzie's critique that adult and child learning should be different raised questions about whether gender differences should be considered in learning (McKenzie, 1977). Knowles eventually revised his book's title and emphasized the continuum between pedagogy and andragogy (Jarvis, 2001). These concepts represent an approach rather than a theory and have continued to be studied in relation to one another (Blaschke, 2019). A comparison of the assumptions in pedagogical and andragogical approaches is given in Table 1 which is adapted from Knowles study (Knowles, 1980).

Table 1. Pedagogy and Andragogy

| Pedagogy | Andragogy |
|---|---|
| Dependent learner | Self-directed and independent learner |
| The teacher is full responsibility for what/how/when is to be learned | The teacher has a facilitator role that helps the learners identify their needs and organize their learning. |
| The teacher is fully responsible for the assessment | The student should also be able to make self-reflection (single-loop reflection) |
| The experience of the teacher and resources play an important role rather than the experience of the learner. | Learning from own and others' experiences rather than passive learning. |
| The determined curriculum is ready to learn in the determined way, time and standards | Real life related tasks based on the needs of the learner are learned. |
| There is a subject-focused education, there is no data on when this learning will be used in life. | Competency development-oriented learning takes place, and those learned in this way can be used directly in real life. |

## 2.4 Heutagogy: Self-determined learning

While technological developments lead to rapid social change, this pace of change in societies should evolve into individuals who decide what and how to learn. Based on this requirement, Hase and Kenyon developed the concept of heutagogy in 2000, stating that heutagogy, self-determining learning, is not a theory but an advance of previous educational approaches, notably move from andragogy to heutagogy (Kenyon & Hase, 2001). Besides, Hase states that while revealing this concept, they make use of theories such as constructivism, humanism, and self-determined learning and are affected by them (Hase, 2017). While this paper provides a general

description of learning theories and their connections, it does not delve into the details of learning theories but instead focuses on the heutagogical (self-determined learning) approach.

In 1969 as Roger emphasized, based on the principles of a student-based approach (constructivism- humanism), we cannot teach people; in particular, we can just make them learn by playing a facilitator role. Therefore, Hase and Kenyon define heutagogy as an approach in which the instructor offers the source in line with the needs, the learners design the course and evaluate themselves in terms of the course and their learning (Kenyon & Hase, 2001). In the heutagogical approach, the human (learner) agency is at the center of the process in which the individual has high control and internal motivation over what to learn, how to learn, and whether the outcome is achieved or not. If the individual gains control of his / her learning, self-efficacy will develop, and this will cause an increment of self-confidence, thus increasing capability (Bandura, 1977). The learners' ability to lead their own learning process, metacognition, and reflection will feed this trust, and double-loop learning will take place. The learner's self-confidence and metacognition skills will enable him/her to be more active in learning and making his/her own decisions. These decisions include determining the curriculum, what questions to answer, how to evaluate it, and, if necessary, how to improve the process.

Since 2000, Blaschke, Hase, and Kenyon have been instrumental in defining and refining the fundamental principles of heutagogy through their published works. These principles are illustrated in Figure 1 (Blaschke, 2015).

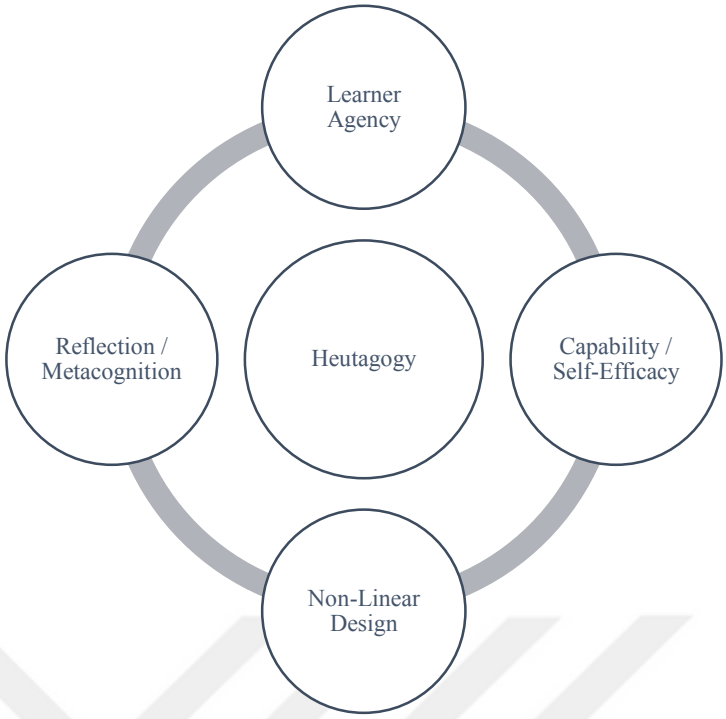



Figure 1. Principles of heutagogy

Based on their most recent contributions, the fundamental principles of heutagogy are provided below in a summarized format (Hase & Kenyon, 2013; Blaschke, 2012).

- To optimize learning, individuals should understand the significance of informal learning, while instructors should only facilitate it instead of controlling it.
- The learner should be considered a partner in developing their learning curriculum and process, with a flexible curriculum that allows for new questions and understandings to be explored as they arise.
- Sample resources should be provided, and learners should be encouraged to explore independently.
- It is important to distinguish between acquiring knowledge and skills for proficiency and deep learning.

- One should trust the learners and understand that teaching and teacher control can hinder learning.
- The assessment and evaluation process should be flexible.
- To encourage better learning outcomes, learners should be encouraged to contextualize concepts, knowledge, and new understandings, leverage experiential learning techniques, and learn collaboratively.
- Learning is not a linear process; it should be individualized as much as possible.
- The primary learning techniques that should be used include reflection, double-loop, and triple-loop learning.

As evidenced by the points, the heutagogical approach places the learner at the forefront of their learning experience. Hase and Kenyon emphasize the importance of the individual learner as "the primary driver of their own learning, which is shaped by their unique personal experiences" (Hase & Kenyon, 2007, p. 112). By taking control of their own learning, individuals can oversee the entire process, from planning to evaluation. A learner who embodies this approach is capable of creating a non-linear design and making informed decisions about the content. By doing so, they develop the ability and self-efficacy to learn the desired outcome, with mastery leading to increased metacognition and reflection (Bandura, 1977). Hase and Kenyon (2000) and Blaschke (2012) have argued that double-loop learning is essential for heutagogy. As complications are not always systematic, learners may encounter problems with their actions, requiring them to identify the deficiency and make the necessary adjustments correctly. The learning process may involve both single-loop and double-loop learning.

Blaschke and Hase (2015) have developed basic guidelines for achieving these principles, which have been revised over time. In order to assess self-

determination learning skills, five fundamental principles serve as the foundation. These principles are crucial in determining the level of self-determination learning skills an individual possesses and will be elaborated upon in greater detail. However, the following five items remain fundamental.

1. Human agency,
2. Capability development,
3. Self-reflection/metacognition,
4. Non-linear teaching-learning.
5. Single and Double Loop Learning

### 2.4.1 Human agency

The principle of learning agency posits that individuals possess an inherent ability to make their own decisions. In his book, Hase expounds upon this idea, arguing that individuals consciously and unconsciously make choices and are active agents in their own learning experiences (Copheutagogy, 2014). A point of contention between Hase and Kenyon concerns the role of pedagogy and heutagogy in learning. While Hase believes that individuals are guided from pedagogy to heutagogy, Kenyon contends that individuals learn with heutagogy from birth but eventually adopt pedagogical methods over time. However, Hase maintains that both approaches are essentially the same and that individuals must develop their heutagogical skills in early life or adulthood. This approach grants learner's full autonomy and accountability in their learning process, permitting them to determine what, how, and how to evaluate their learning.

### 2.4.2 Capability development

The concept of capability is a fundamental principle in the heutagogy approach. This approach emphasizes the importance of learners acquiring both competencies and capabilities (Blaschke, 2012). In the mid-1980s, the concept of 'capability' emerged in the UK as a response to the quickly changing work environment and the need for increased competitiveness (Hase & Davis, 1999). According to Cairns (2000, p. 1), the most widely accepted definition of capability is 'having justified confidence in one's ability to take appropriate and effective action to formulate and solve problems in both familiar and unfamiliar and changing environments'. Cairns (2000, p. 2) also explains the relationship between capability and competence, stating that 'competence is the set of individual and measurable skills that are demonstrated and evaluated against agreed standards'; capability, on the other hand, is a versatile human quality that involves integrating knowledge, skills, and personal qualities effectively and appropriately in response to diverse, familiar, and unfamiliar circumstances. Capability is a holistic concept that encompasses talented individuals who can effectively cope with the rapid developments in an ever-changing world. Such individuals possess a versatile capacity to manage change (Hase & Kenyon, 2000). Capable people tend to have high levels of self-efficacy, which enables them to learn, work cooperatively with others, and apply their skills to new situations (Hase & Davis, 1999). Skilled people are more likely to manage complex and nonlinear challenges (Phelps et al., 2005).

Phelps and his colleagues conducted a four-year action research study to investigate the development of skilled computer users among preservice teachers (Phelps et al., 2005). The study examines the changes in end-user computer education in both theory and practice. With the constant advancements in

technology, it is challenging to determine what end-user computer students will need to know in the future. Therefore, the study focuses on equipping computer users with the necessary skills to adapt to uncertain, changing, and complex futures (Phelps et al., 2005). In Phelps and his colleagues' study, the characteristic features of competent computer users are outlined as follows:

1. Possess confidence in their own skills and capabilities.
2. Exhibit determination and calmness.
3. Take risks, are courageous in testing new things, and are not afraid to make mistakes.
4. Use systematic and analytical thinking.
5. Have confidence and are provocative, with a positive attitude towards using computers.
6. Possess technological wisdom.
7. Have a love of learning.
8. Exhibit steadiness of use.
9. Possess problem-solving abilities.

In conclusion, Phelps and colleagues (2005) emphasized that the goal of the learning experience is to develop the ability to learn (Phelps et al., 2005).

### 2.4.3 Self-reflection/metacognition

Metacognition and self-reflection are required for double-loop learning management in the heutagogical approach. Metacognition is evaluating knowledge and regulations about cognitions (planning the learning path, monitoring performance, organizing learning, and evaluating learning outcomes) for individual learning (Öztürk, 2017). Hase determined that the frontal lobe of the brain is important for metacognition, and this function can be damaged by serious illnesses and drug use. It can also be improved by various activities (Copheutagogy, 2014). Mezirow defines metacognition as a high level of skill and informing and regulating cognitive strategies (Mezirow et al, 1990). Mezirow states that a lot of what we learn while living in constant change comes from our struggle to solve problems. However, it should not be confused with the "thoughtful action" we learn from our past experiences, which affects our subsequent behavior. Thoughtful action may be reflective, but it does not involve making critical decisions. Reflective action is to critically question what the learner did wrong. It requires the ability to evaluate the problem, the meaning of the problem, how the process works on the way to a solution, and the result, i.e. everything. (Mezirow et al, 1990). It also includes self-regulation within metacognition and can be discussed under three headings: planning, regulation and monitoring, and evaluation (efficiency of learning). In this definition, making and evaluating the distinction between monitoring and regulating is the most complex part. While monitoring is the evaluation of learning and performance in the learning process, the regulation includes the course objectives and behavior and cognitive change of the person (Öztürk, 2017).

So, how can we measure the validity of our metacognition or post-reflection thinking? Mezirow suggestions are, first, the process we follow during problem-

solving is a way that has been found logical before. Secondly, we must have empirical data showing whether we are successful without solving the problem. (Mezirow et al, 1990). In this way, metacognition may have an effect that triggers transformative learning in individuals with increased awareness.

### 2.4.4 Non-linear learning

The learning path is a crucial concept in the learning process, as it defines the sequence in which learning outcomes are acquired. Typically, courses are determined by central systems subject-matter experts and standardized for different age groups. However, it is imperative to revise this approach to accommodate individual learner preferences and pace. Two types of learning paths exist: linear and non-linear (Rahayu et al., 2021). The linear path follows the curriculum and comprises three primary stages. The first stage involves transferring the learning objectives to the learner. The second stage involves evaluating the learner's results, providing feedback, and measuring their success. Finally, the learner is directed to the missing or incomplete learning outcomes or the next stage of acquisition (Rahayu et al., 2021).

The heutagogical approach, on the other hand, emphasizes self-determined learning, talent development, self-reflection, double-loop learning, and non-linear learning design (Blaschke, 2019). The non-linear learning path allows students to design their own learning outcomes and supports various learning activities, such as exploring, creating, collaborating, connecting, sharing, and reflecting as indicated in Figure 2 (Blaschke & Hase, 2014).

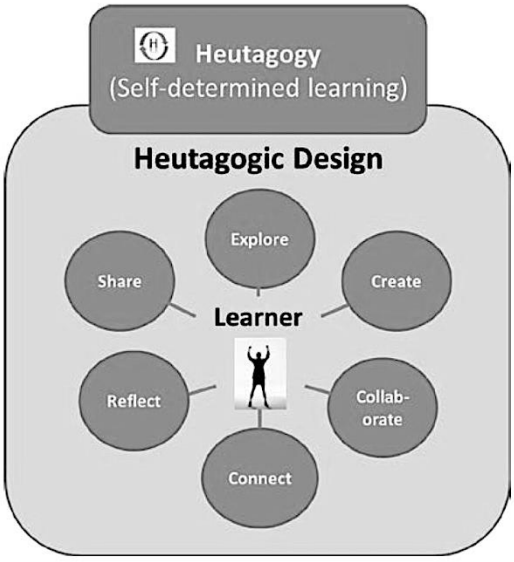



Figure 2. Heutagogy design elements

As a result, learning objects and stages of learning may differ among students, as they can choose according to their interests, backgrounds, or experiences. This approach empowers students to take charge of their learning and tailor it to their individual needs (Rahayu et al., 2021).

### 2.4.5 Double loop learning

Chris Argyris says that perhaps learning should be defined as detecting and correcting mistakes. Learning took place when used within an implementation where we can correct mistakes with what has been learned. Single-loop learning is used to find and solve errors without changing/ interfering with policies. Double-loop learning also requires intervention in the governing values, and the competence of the person is crucial (Argyris, 2002). Along with Argyris' famous thermostat example, another sample from Tagg's curriculum example that clearly clarifies the distinction between single and double-loop learning. Assume that there is a curriculum which delivered by the teacher of the course or the central administration

with a series of lessons in Figure 3. Therefore, the action strategy is to plan the lessons following this curriculum and transfer them to the students, and the problem that may arise may be that the expected learning is not realized.

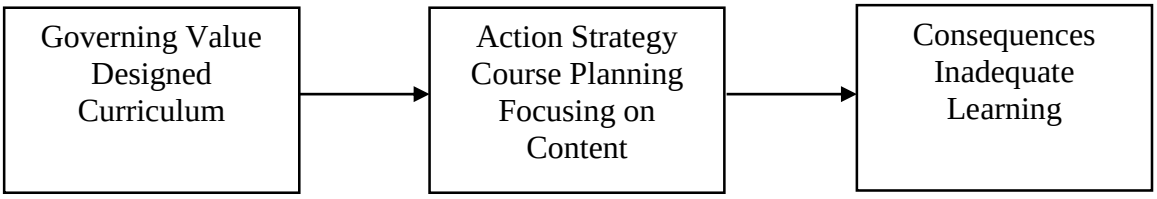



Figure 3. Curriculum assumption sample

The single loop tries to solve the problem by interfering with the planning of the course without changing the curriculum and content. However, if there are other factors and there is a problem with the curriculum and content prepared for the course, then double-loop learning aims to solve the problem by intervening in the curriculum as indicated in Figure 4 which is adapted from Tagg (Tagg, 2010).

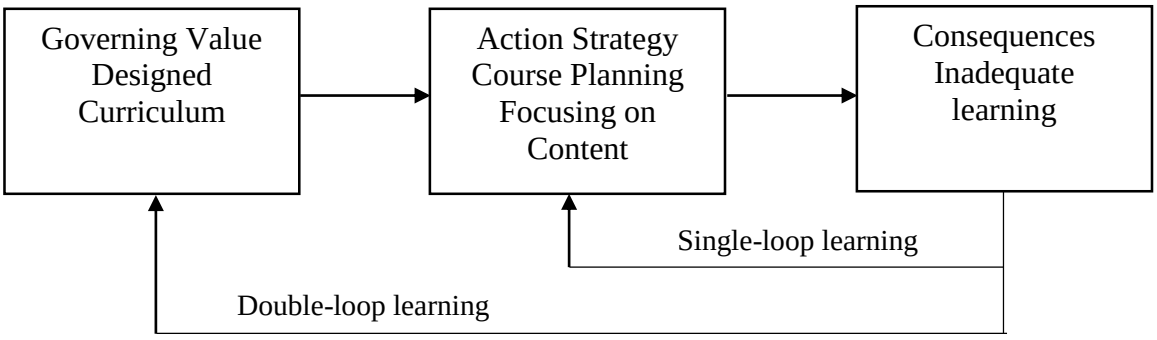



Figure 4. Double-loop learning

Double-loop learning allows to take the problem as a transition and re-evaluate what the curriculum is, how it works, and what it is for because the curriculum should be about what the learner should learn rather than what the teacher teaches (Tagg, 2010). The level of learning, what, how much, and how they learn are the most significant feedback for creating and changing governing values. This is the same in educational institutions and organizations/institutions in business life, but it is crucial beyond the institution that employees who are in decision-making positions in professional organizations can perform double-loop learning.

## 2.5 Pedagogy-andragogy-heutagogy continuum

Heutagogy, andragogy, and pedagogy should appear as extensions of each other rather than as interchangeable or better learning approaches (Moore, 2020). The major difference between the three approaches can be stated that learner autonomy increases as we move from pedagogy to heutagogy, and the individual becomes a more independent learner. However, these three approaches also have elements that contain each other (Blaschke, 2012).

Table 2. Pedagogy Andragogy Heutagogy Continuum

| Pedagogy<br>Instructor-directed | Andragogy<br>Self-directed | Heutagogy<br>Self-determined |
|---|---|---|
| Single loop learning | Single loop learning | Double loop learning |
| Know-how and skill transfer | Gaining competency | Gaining capability |
| Linear design by instructor | Linear design by instructor and learner | Nonlinear design by learner |
| Getting students to know the content | Getting students to know the content | Getting students understand how they learn |
| Lowest learner autonomy | Higher learner autonomy | Full learner autonomy and maturity |

As the student progresses through the PAH process, an increase in learner sophistication and independence is expected, whereas a decrease in the need for the instructor occurs (Blaschke, 2012). In pedagogy, which is at the beginning of the continuum, learner autonomy is minimal; this type of training has a higher level of instructor control, so face-to-face or physical cooperation is needed (Blaschke, 2019). As the transition from pedagogy to andragogy further develops students' competencies, the single loop learning phase will continue (Hase & Kenyon, 2000). In heutagogy, the third stage of continuity, students take full responsibility for their learning and less intervention from the instructor (Blaschke, 2019). Here, learner autonomy and maturity are at their highest, and there is double-loop learning (Argyris, 1976).

Although it is claimed that the studies on these three learning approaches point to continuity, both Knowles (1988) and Hase & Kenyon (2000) claim in their studies that people who are educated with the traditional (pedagogical) approach weaken the learning skills they have after birth and make individuals dependent on the teacher. Therefore, andragogy and heutagogy undertake the mission of helping regain lost learning skills (Hase & Kenyon 2000).

## 2.6 Practical implementations of heutagogy

The advent of Web 2.0 technologies has greatly facilitated the implementation of heutagogy, allowing for its greater practicality and convenience. The use of innovative tools such as smartphones and web-based applications has enabled users to collaborate and communicate in ways that were not previously possible. Through the utilization of these latest tools, learners can produce content and share it online, thereby supporting the principles of heutagogy (Blaschke, 2012). Although it is a new and developing approach in practice and theory, the number of international research and practice in the field of heutagogy is increasing day by day. In this section, some of these applications are shared in relation to the study.

Jean Ashton, an esteemed educator in the early childhood education department at the University of Sydney in 2005 and 2006, implemented two courses, Multiliteracies and Contemporary Perspectives, using distance education and heutagogical principles. Ashton & Newman reported that assessment proved to be one of the greatest challenges preschool teachers who adopted heutagogical approaches in their education faced (Ashton & Newman, 2006). According to heutagogy, learners are expected to be able to assess their own learning (Hase & Kenyon, 2000). However, the study revealed that while participants actively

participated in the learning process, they were unable to fully meet the assessment requirements. This led to discussions about whether over-teaching was being performed, and trainers in distance education were found to have to spend three times more effort on face-to-face training. Furthermore, the study highlighted the challenges posed by differences in learners' technology literacy and access to technology (Ashton & Newman, 2006). To overcome these difficulties, pre-course workshops were conducted to familiarize participants with the tools and practices used in online learning. However, participants still encountered challenges such as accessing materials, slow internet speeds, downloading and opening files in various formats, and other similar issues. Despite these challenges, the study revealed that online learning offered several benefits, including the ability to save time that would have been spent traveling to the university for face-to-face education and the usefulness of online discussion platforms. Nonetheless, it was found that the literacy and access gap between learners must be addressed for online training to be practical.

In 2020, Wismaningrum and colleagues conducted a study in Indonesia to explore how online learning practices aligned with a heutagogic approach during the pandemic. Their findings emphasized the effectiveness of a self-determined approach to teaching and learning in higher education, contributing to the development of lifelong learners (Wismaningrum et al. 2020).

Kline (2015) also reported that heutagogy is beneficial for healthcare professionals and nursing students in complex learning environments (Kline, 2015). Another study in the UK highlighted how the heutagogic approach supports student autonomy, collaborative reflection, and critical thinking. Reflective practice was found to help students take control of their learning and apply knowledge in real-

world situations, leading to greater motivation and engagement (Canning & Callan, 2010).

The heutagogical learning approach is being adopted in Malaysian higher education institutions as a transformation initiative to enhance the quality of education and produce graduates who are equipped for the twenty first century workforce (Tiew & Abdullah, 2021). Although it is still in its early stages' implementation, 26 local studies have been examined to assess learner-centered, double-loop learning, non-linear learning, and capability & capacity development (Tiew & Abdullah, 2021). The findings of the study revealed that the most applied component was student-centered learning, while the least utilized was double loop learning which is directly related with self-assessment and reflection. It has been noted that one of the biggest challenges is that students lack the twenty first century skills and are not prepared for this approach, and similarly, lecturers are resistant to change and don't have the necessary skills to implement the heutagogical learning approach (Tiew & Abdullah, 2021).

The examples examined in this study highlight the significance of incorporating the heutagogical approach within field practices. Both online and offline materials and approaches are worthy of careful consideration in program designs to support heutagogical approach. Additionally, although self-assessment / reflection of learning outcomes is a crucial element for fostering learner autonomy, there is scope for improvement in its practical implementation. In this context, understanding the connection between self-determined learning skills and learning preferences proves to be of importance for program designers, lecturers, and learners.

# CHAPTER 3

# METHODOLOGY

In this chapter, a comprehensive outline of the methodology used in the research is provided. This includes a detailed explanation of the research design that was employed, the selection criteria that were used to choose participants, and an overview of the participants' profiles. Furthermore, the data collection procedures and tools that were utilized are elaborated upon, as well as the methods of analysis that were implemented to interpret the data. Finally, the strategy for analyzing the collected data is presented, offering a clear roadmap for understanding how the research findings were derived.

## 3.1 Research design

This study employs a correlational research design within a quantitative research framework to explore the relationship between adult learners' learning style preferences and their self-determined learning skills. The SDLSS used to measure these skills. The correlational design is suitable for examining the strength and direction of associations between these variables. By using statistical techniques, the study aims to identify potential patterns or trends that suggest how different learning preferences may influence or relate to self-directed learning capabilities. The primary goal is to determine the degree of correlation between the variables under investigation.

## 3.2 Participants

This study included adult learners with diverse educational and professional backgrounds. They were selected to investigate the relationship between their learning style preferences and self-determined learning skills. The sample comprised individuals who met the study's inclusion criteria, ensuring a representative range of learning experiences and preferences. It is important to note that participation in the survey was entirely voluntary. The researcher received permission from the Ethics Committee for Master's and Ph.D. Theses in Social Sciences and Humanities to protect participant privacy given in Appendix A. In addition, the consent form used to inform participants about the purpose of the research and obtain their consent is presented in Appendix B. The researcher recruited participants through technological means, such as social media, and all data collected were anonymous. The study used data from participants who met specific criteria,

- holding a four-year university degree,
- having participated in at least one compulsory or voluntary professional and personal development study within the last year,
- full-time employee,
- no bachelor's degree distinction was made.

The reason for selecting this particular group for research is to investigate the self-determined learning skills of adult learners from various professional backgrounds. While most previous studies have focused on educators, university students, and specific professionals, this research aims to contribute by examining adult learners from mixed vocational groups. The sample was chosen to ensure maximum diversity in terms of sectors worked and professional experiences. However, to maintain some uniformity in terms of educational background, all

participants were required to have a four-year college education, to be full-time employees, and to have completed at least one training course within the past year.

Determining an adequate sample size considers the complexity of these analyses, including the number of items, dimensions, and the desired precision of estimates. Following guidelines by Hair for structural equation modeling, a rule of thumb is to aim for a minimum of five to ten participants per item (Hair et al., 2010). Therefore, with 22 items for scale and 27 items for questionnaires, a suggested sample size might range from 245 to 490 participants. This approach ensures that the study is adequately powered to detect meaningful relationships, contributing to the robustness of validity and reliability assessments.

When the study was completed, a total of 341 participants were reached. Two participants did not meet the full-time work experience requirement, and six were excluded for not participating in a professional development program in the last year. Additionally, the results of 60 participants were incomplete and, therefore, not included in the final data set. This resulted in a total of 273 results being used in the study. The age distribution of the valid participants was as follows: 20.1% were aged 20-30, 48.0% were aged 31-40, and 31.9% were 45 or above. In terms of full-time working experience, 21.6% had one to five years of experience, 42.5% had 6-15 years, and 35.9% had over 15 years of experience.

Regarding educational background, 33.0% of participants graduated from a faculty of education, 24.2% from the faculty of arts and sciences, 23.8% from engineering, 7.0% from medical and nursing, and 12.1% from other faculties.

In terms of occupation, most of the participants were teachers (43.2%), followed by engineers (22.0%). Other represented occupations included sales professionals (5.5%), analysts (4.0%), doctors (3.7%), and psychologists (2.9%).

Various other occupations were represented in smaller numbers, including architects, HR professionals, pharmacists, and others.

## 3.3 Measures

To address the research questions, participants completed the SDLSS created by Bahar Şahin Sarkın and Gökçe Güvercin Seçkin in 2023, as well as four questionnaires (learning styles preferences questionnaire, learning resources preferences questionnaire, study techniques preferences questionnaire, and critical reflection preferences questionnaire) developed by the researcher. The SDLSS and questionnaires are given in Appendix D and the questionnaire shared in Appendix F.

### 3.3.1 Self-determined learning skills scale

The SDLSS is a comprehensive tool that has been developed to assess the self-determined learning abilities of university students. The scale, which was created by Bahar Şahin Sarkın and Gökçe Güvercin Seçkin, comprises a total of 22 items that have been categorized into four distinct sub-dimensions, namely learning to learn, learner autonomy, self-motivation, and self-direction. The development process of the SDLSS involved defining the variable to be measured and creating the items, which were then subjected to expert opinions to ensure their accuracy and relevance. Furthermore, to ensure that the scale was practical and easy to understand, a pre-test was conducted with six university students, and data were collected from three different study groups to validate and analyze its reliability. The results of the original study showed that the SDLSS is a valid and reliable measurement tool for assessing self-determined learning skills among university students. In fact, all 22 items of the scale accounted for 42.17% of the total variance in Experiential Factor

Analysis (EFA), which indicates that it is a comprehensive tool that covers a wide range of factors related to self-directed learning. Moreover, its reliability was verified through high internal consistency and test split methods, and item analysis also demonstrated its discriminative qualities. Overall, the SDLSS is a valuable tool for educators and researchers who are interested in assessing and improving the self-determined learning abilities of university students.

### 3.3.2 Learning styles preferences

This part of the questionnaire aims to understand the frequency with which adult learners prefer the learning styles. Lee and his colleagues conducted research in 2000 based on four primary learning styles recommended in the literature (Lee et al., 2000). These four learning styles are;

(a) lectures,

(b) in-class discussions and feedback,

(c) group-based projects, and

(d) individual projects (Caffarella & Barnett, 1994)

Inspired by this study by Lee et al., learning style preference questions were created to understand the tendencies of adult learners. The question, "Indicate how often you prefer the following types of learning styles for efficient learning in a new learning process (online or face-to-face)," will be asked to the participants, and they will be asked to indicate their preference as rating style for the four learning styles based on Lee and colleagues above (Lee et al., 2000). Participants will be asked to mark each item by choosing one of the following: never (1), rarely (2), sometimes (3), often (4), always (5). To make this question inclusive, the participant is asked to consider all online and face-to-face options to evaluate all learning processes.

### 3.3.3 Learning resources preferences

As part of a questionnaire to understand the learning process of adult learners, a question was included to identify their preferences for learning resources. The question asked respondents to indicate their preferred resources for both face-to-face and online learning experiences using a rating scale (ranging from "Never" to "Always"). The survey categorized learning resources into six groups:

1. Sites, blogs, and other web pages found through search engines
2. Readings such as books and articles
3. Videos
4. Listening tools, including podcasts
5. Experts
6. Social media tools

The categories were created to understand trends in watching, listening, getting expert opinions, using social media tools, learning by reading, and learning by surfing the internet.

### 3.3.4 Study techniques preferences

Blaschke and Hase conducted a study in 2015, where they identified seven important elements in designing a heutagogical learning environment. These elements are exploration, creativity, collaboration, community, openness, reflection, and assessment (Blaschke & Hase, 2015). These elements provide a framework for creating an effective learning environment. One of the core principles of heutagogy is that learners are actively involved in the learning design process and have the autonomy to design their own learning.

In this context, a questionnaire was created to understand the study technique preference tendencies of adult learners who participated in the study. The most used study techniques were included in the survey (Dunlosky et al, 2013):

- working by solving questions
- self-lecture
- study on concepts
- rereading
- visualization
- study with underlining
- study with the instructor
- summarizing
- listening/monitoring
- peer and group discussion

Participants will be asked to mark each item by choosing one of the following: never (1), rarely (2), sometimes (3), often (4), always (5) to understands learner study technique preferences.

### 3.3.5 Critical reflection activity preferences

As part of a critical reflection activity preferences questionnaire, adult learners were asked to evaluate their learning by identifying their preferred techniques for both the formative and summative assessment. The following techniques were included in the survey:

- learning logs,
- taking notes/listing,
- feedback forms,

- concept maps,
- visualization (video/drawing),
- stakeholders' and service users' opinions,
- peer/group discussions.

These techniques were compiled from Elizabeth Smith's study on reflective techniques for healthcare education in 2011, which included methods for reflective writing (learning logs), reflective summary (taking notes/listing), diagrammatic representation (concept maps), creative representation (visualization), perspective-taking (stakeholders' and service users' opinions), and interaction (peer group discussions) fields (Smith, 2011).

The participants were asked about their preferred techniques for managing their learning throughout the learning process. The question was designed to avoid using the concepts of formative and summative assessment and reflection. The question was framed as follows: "To what extent would you use the following techniques to manage or improve your learning during and after a new learning experience?" Participants were expected to choose one of the following options for each item: never (1), rarely (2), sometimes (3), often (4), and always (5).

## 3.4 Pilot study

Before conducting the SDLSS and the questionnaire to adult learners, a pilot implementation was carried out first to evaluate and understand the questions. Despite a lack of academic studies on the number of participants required for the pilot application, it was decided to apply it to five participants. The pilot study aimed to administer the scale and the questionnaires to five participants and collected feedback on the questionnaire to examine the clarity of the questions and give them

their final shape. Participants were asked to make a general evaluation of the clarity and understanding of the questions and to answer timed questions to determine the completion time of the survey. Based on participants' feedback and the researcher's experience during the pilot, the scale and the questionnaire were reported to be clear, and according to the data obtained from the survey software used, the questionnaire was completed in an average of eight minutes. Therefore, no changes were made to the questionnaire and the scale, and they were conducted.

### 3.5 Data collection

To ensure a smooth data collection process for this study, the researcher used a user-friendly online survey tool (Survey Monkey) that can be accessed easily through various platforms, including e-mail groups, social media, and education-related forums. Necessary measures were taken to ensure their identities remained anonymous and ethical standards were adhered to by implementing data privacy measures throughout the survey process. The researcher was available during the specified timeframe to assist participants with any issues they may encounter while completing the survey. The scale and the questionnaire were accessible through various platforms, such as email groups, social media, and education-related forums, to reach a diverse and extensive participant base. Announcements and dissemination made on Facebook, LinkedIn, WhatsApp and targeted email groups and forums. Demographic information, such as graduate faculty, study field, years of work experience, age, and number of learning activities attended in 2023, were collected to control for key variables and interpret the obtained results.

In summary, this data collection process was designed to be a positive, helpful, and safe experience for all participants involved. The researcher had

provided a clear and detailed description of the approach to ensure transparency and gain participants' trust.

### 3.6 Data analysis

The first step was to investigate the reliability and validity of the SDLSS in determining the skills of diverse adult learners. The initial phase commenced with data cleaning, an essential prerequisite for ensuring the quality and integrity of the dataset. This involved importing the collected data into a statistical software suite, followed by a comprehensive screening for missing values and outliers and a verification that the data adheres to the necessary analytic assumptions.

The subsequent stage involved descriptive statistical analysis to establish a foundational understanding of the data's distribution, central tendencies, and variability. Key metrics such as means, standard deviations, and frequencies provided a snapshot of the data's overall characteristics. The essence of the analysis concerns the assessment of reliability, which is usually measured through Cronbach's alpha to measure internal consistency. An item analysis was also conducted to examine item-total correlations, potentially identifying and excluding items that did not contribute to the consistency of the scale. Construct validity was investigated through exploratory factor analysis to determine whether the data were consistent with the hypothesized factor structure. The next step involved synthesizing the findings into a comprehensive report, interpreting the statistical results within the self-determined learning context, and discussing the results of the reliability and validity coefficients.

In the correlational research section of the study, the researcher explores the associations between adult learners' SDLSS scores and their self-reported learning

styles preferences, learning resources preferences, study techniques preferences, and critical reflection preferences as captured through items with rating scales. The point-biserial correlation was employed to measure linear relationships between normally distributed variables, or Spearman's rho for ordinal data or non-normal distributions, to identify the strength and direction of these associations.

Statistical significance was tested against an alpha level of 0.05 to determine the probability of the correlations occurring by chance. The resulting correlation matrix displayed the inter-variable relationships. While significant correlations were be highlighted, we emphasize that correlation did not equate to causation. Findings were interpreted in the context of their educational significance and theoretical implications, recognizing the limitations inherent to correlational analysis. This section aims to enrich the dialogue on self-determined learning by examining the interplay between diverse learning processes and outcomes.

### 3.7 Exploratory factor analysis (EFA)

Before testing reliability and validity, EFA was conducted to ensure that the scale items were consistent with the underlying factor structure.

#### 3.7.1 Assumption check

Prior to conducting factor analysis, it is imperative to assess the sufficiency of the sample size. Variability in correlation coefficients across samples is a noteworthy concern, particularly given that smaller samples are prone to greater fluctuations than their larger counterparts, which in turn affects the reliability of factor analysis outcomes. Field (2017) has extensively discussed the intricacies related to the required sample size for factor analysis, ultimately positing that the determination of

an adequate sample size is contingent upon a multitude of factors. In this study, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was employed (Kaiser, 1970) as a methodological tool. The KMO measure, which can be computed for both individual and multiple variables, quantifies the proportion of the squared correlation among variables relative to the squared partial correlation among them. The resultant KMO statistic, which oscillates between 0 and 1, serves as an indicator of the suitability of factor analysis. Specifically, a KMO value of 0 suggests that the sum of partial correlations significantly outweighs the sum of correlations, signaling a disorganized pattern of correlations and, consequently, rendering factor analysis potentially inappropriate. Conversely, a KMO value approaching 1 denotes a cohesive correlation pattern, thereby implying that factor analysis is likely to segregate distinct and reliable factors. Kaiser (1974) posits that KMO values exceeding 0.5 are to be deemed acceptable, cautioning that values below this threshold necessitate either the acquisition of additional data or a reevaluation of the variables under consideration. Furthermore, values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great and values above 0.9 are superb (Hutcheson & Sofroniou, 1999).

The KMO value calculated as 0.79 in this study shows that the data are at a good level for factor analysis. In advancing the methodology of factor analysis, an initial step involves the scrutiny of variable correlation magnitudes. As delineated by Andy Field, this examination unveils two principal challenges: firstly, the presence of insufficiently robust correlations, and secondly, the occurrence of excessively elevated correlations among the variables under study. The correlation procedure facilitates the construction of a correlation matrix encompassing all pertinent variables, a process integral not only as a standalone operation but also as an

embedded component within the primary factor analytical procedure. In scenarios where either concern arises, the recommended corrective action excludes problematic variables from the analysis. Bartlett's test of sphericity is operated to assess the congruence of the population correlation matrix with an identity matrix systematically. The significance of Bartlett's test serves as an indicator that the observed correlation matrix significantly deviates from an identity matrix, thereby affirming the variables' suitability for factor analysis.

Within the context of this research, Bartlett's test of sphericity yielded a $\chi 2$ value of 1,110.383 with a p-value less than .05, substantiating the presumption of multivariate normality. This result suggests that the individual variables and their linear combinations within the scale adhere to a normal distribution, aligning with the requisite conditions for factor analysis.

Andy Field suggested examining the variables in the correlation matrix that do not correlate with any other variables or correlate very highly (r = .9) (Field, 2017). Looking at the correlation matrix in this study, all items in the SDLSS correlated reasonably well with others and none of the correlation coefficients were excessively large; Therefore, it was observed that no item would be eliminated at this stage. In addition, the determinant is used for evaluating multicollinearity within statistical analyses. Field (2017) posits that the determinant should exceed a threshold of .00001. This value, located beneath the Correlation Matrix, serves as a diagnostic tool to assess the presence of multicollinearity. Determinant values surpassing .00001 signify the absence of multicollinearity concerns. Given that our obtained value exceeds .00001, we can infer that multicollinearity does not compromise the integrity of our analysis. In this research, we adhere to this guideline by employing a determinant of .015, thereby satisfying the stipulated criterion.

### 3.7.2 Result of exploratory factor analysis

The assumptions were checked regarding the data, sample size and variables. When applying factor analysis, the choice of rotation method depends on whether the researcher thinks the underlying factors should be linked (Field, 2017). Andy Field has suggested that if there are theoretical grounds for considering the factors to be independent (unrelated), choose one of the orthogonal rotations. However, if the theory suggests that the factors may be related to each other, then one of the oblique rotations (direct oblimin or promax) should be chosen (Field, 2017). In this study, direct oblimin from oblique rotation method in EFA was preferred because the factors were thought to be theoretically related to each other.

Andy Field recommends looking at the communalities to decide the number of factors. If these row values are all 0.7 or above and have fewer than 30 variables, remove the factors by keeping the factors with Kaiser's eigenvalues greater than 1. He stated that the criteria are suitable. Likewise, the default option is appropriate if the sample size exceeds 250 and the ensemble mean is 0.6 or greater. However, in this study, values below 0.7 are found in the communalities were calculated as 0.520. Therefore, Horn's parallel analysis was preferred the determination of the number of factors. Horn's parallel analysis, an empirical technique established in 1965, facilitates the identification of the requisite number of components in a factor analysis essential for adequately explaining the variance observed within a dataset (Horn, 1965). The procedure involves the generation of random eigenvalues via SPSS syntax, followed by a comparative analysis between these values and the eigenvalues derived from the dataset under investigation. The comparison revealed that the first four eigenvalues from the original dataset surpassed those generated

randomly, thus substantiating the adoption of a four-factor solution for this study. The results are presented in Table 3.

Table 3. Eigenvalues of The Data and Parallel Analysis

| Factor | Eigenvalue of the actual data | Eigenvalue of the random data |
|---|---|---|
| 1 | 4.09 | 1.55 |
| 2 | 2.01 | 1.45 |
| 3 | 1.59 | 1.38 |
| 4 | 1.45 | 1.31 |
| 5 | 1.11 | 1.26 |

In this research, oblique rotation technique was used to determine to what extent the four factors explained the variance and to ensure the relationship between the factors. In the direct oblimin rotation method, items with a factor loading of the items 0.30 are generally processed as the lower value point (Strangor, 2010). According to the EFA result, the four-factor component explains 42.24% of the variance in this study. The eigenvalue information about the four factors and the explained variance are presented in Table 4.

Table 4. Total Variance Values Explain

| Factor | Total eigenvalue | Variance explained % | Cumulative % |
|---|---|---|---|
| 1 | 4.34 | 19.74 | 19.74 |
| 2 | 1.96 | 8.89 | 28.63 |
| 3 | 1.52 | 6,91 | 35.55 |
| 4 | 1.48 | 6.69 | 42.24 |

As seen in Table 4, the first component contributed 19.74%, the second component 8.89%, the third component 6.91%, and the fourth component 6.69%, resulting in a total variance of 42.24%.

Table 5 shows the factor loadings after rotation. The scale items used throughout the study were named as in the original study to achieve parallelism in comparing and interpreting the results.

Table 5. Summary of EFA Results

| Item | Rotated factor loadings | | | |
|---|---|---|---|---|
| | Learning to learn | Learner autonomy | Self motivation | Self direction |
| m30 | .74 | | | |
| m27 | .65 | | | |
| m18 | .57 | | | |
| m25 | .55 | | | |
| m10 | .42 | | | |
| m29 | .37 | | | |
| m9d* | | .61 | | |
| m13d* | | .60 | | |
| m2d* | | .58 | | |
| m21d* | | .51 | | |
| m19d* | | .49 | | |
| m23d* | | .47 | | |
| m11d* | | .46 | | |
| m12 | | | .79 | |
| m8 | | | .68 | |
| m20 | | | .64 | |
| m22 | | | .48 | |
| m4 | | | .32 | |
| m1 | | | | .71 |
| m24 | | | | .68 |
| m3 | | | | .65 |
| m17 | | | | .41 |

*Negative items

As indicated in Table 5, the scale items are categorized into four distinct factors, determined through an integrative approach that considers both the theoretical framework and the empirically derived factor loadings. The titles for these factors are as follows: Learning-to-Learn, Learner Autonomy, Self-Motivation, and Self-Direction. These categorizations were initially proposed by Bahar Şahin Sarkın and Gökçe Güvercin Seçkin in their 2023 scholarly contribution.

The empirical findings of the current investigation exhibit a notable alignment with those reported by Bahar Şahin Sarkın and Gökçe Güvercin Seçkin, particularly in their work with university student cohorts. However, specific variations are observable. In the context of this study, which surveyed university alumni and full-time employed adult learners, items m17 and m24 were attributed to the self-direction factor. This contrasts with the 2023 study, where these items were associated with the learning-to-learn factor. Furthermore, item m10, which falls under the learning-to-learn category for the adult learner sample in the current analysis, was classified under the self-direction factor in the work of Bahar Şahin Sarkın and Gökçe Güvercin Seçkin. Additionally, item m4 is allocated to the self-motivation group in this study, diverging from its association with the self-direction factor in the 2023 research, as mentioned earlier.

The correlation Table 6 shows the relationships between four factors: learning to learn, learner autonomy, self-motivation, and self-direction. The values in the table represent Pearson correlation coefficients, indicating the strength and direction of the linear relationships between these factors.

Table 6. Correlations Between Factor Scores

| | Learning to learn | Learner autonomy | Self-motivation | Self-direction |
|---|---|---|---|---|
| Learning to learn | | | | |
| Learner autonomy | .28** | | | |
| Self-motivation | .34** | .12 | | |
| Self- direction | .44** | .25** | .22** | |

** p < .01, *p < .05

The results in Table 6 show that learning to learn has significant positive correlations with learner autonomy ($r = 0.28$, $p < 0.01$), self-motivation ($r = 0.34$, $p < 0.01$), and self-direction ($r = 0.44$, $p < 0.01$). This suggests that individuals who have high score in learning to learn tend to exhibit higher levels of leaner autonomy, self-motivation, and self-direction in their learning processes.

Learner autonomy is also significantly positively correlated with self-direction ($r = 0.25$, $p < 0.01$), but it is not statistically significant with self-motivation ($r = 0.12$). This indicates that while learner autonomy may contribute to self-direction, it has a limited direct effect on self-motivation. Additionally, self-motivation is positively correlated with self-direction ($r = 0.22$, $p < 0.01$), suggesting that higher scores of self-motivations are associated with greater self-direction in learning.

# CHAPTER 4

# FINDINGS

In this chapter, the findings obtained from the research will discuss. The study's results offer valuable insights into the relation between adult learners' learning style preferences and their self-determined learning skills. By conducting statistical analysis, the study identified important correlations between the variables, which shed light on significant trends and patterns in how learning preferences may impact or be connected to the development of self-determined learning capabilities.

First, the distribution explaining the demographic characteristics of the study population was examined, and the results are summarized in Table 7. The study participants have an average age of 37 (M = 37) and an average full-time working experience of 12.8 years. 33% graduated from the faculty of education, 24% from the faculty of arts and science, 24% from the faculty of engineering, and 19% from other faculties. Most participants were teachers (n = 118), and engineers (n = 60) with participants from 24 different professional groups. Additionally, based on the survey responses regarding learning environment preferences, 42 participants (15%) indicated a preference for online learning, 83 participants (30%) indicated a preference for face-to-face learning, and 148 participants (55%) preferred a hybrid approach.

Table 7. Frequencies and Percentages of The Participants

| Variable | Categories | F | % |
|---|---|---|---|
| Age | 20-30 years | 55 | 20.1 |
| | 31-40 years | 131 | 48.0 |
| | 41 years and above | 87 | 31.9 |
| Full time working experience | 1-5 years | 59 | 21.6 |
| | 6-15 years between | 116 | 42.5 |
| | 16 years and above | 98 | 35.9 |
| Graduated faculty | Education | 90 | 33.0 |
| | Arts & Sciences | 66 | 24.2 |
| | Engineering | 65 | 23.8 |
| | Other | 52 | 19.1 |
| Occupation | Academician | 2 | .7 |
| | Analyst | 11 | 4.0 |
| | Chef | 1 | .4 |
| | Lawyer | 3 | 1.1 |
| | Banker | 2 | .7 |
| | Biologist | 1 | .4 |
| | Translator | 1 | .4 |
| | Doctor | 10 | 3.7 |
| | E-Commerce | 10 | 3.7 |
| | Pharmacist | 5 | 1.8 |
| | Editor | 3 | 1.1 |
| | Nurse | 4 | 1.5 |
| | HR | 6 | 2.2 |
| | Captain | 1 | .4 |
| | Chemist | 1 | .4 |
| | Finance | 1 | .4 |
| | Architect | 6 | 2.2 |
| | Engineer | 60 | 22.0 |
| | Musician | 1 | .4 |
| | Teacher | 118 | 43.2 |
| | Psychologist | 8 | 2.9 |
| | Sales | 15 | 5.5 |
| | Sociology | 1 | .4 |
| | Designer | 1 | .4 |

The study findings were analyzed in two main stages. Firstly, the validity and reliability of the SDLSS scores were evaluated within the context of the sample used. In the second part, the study examined the correlation between adult learners' the SDLSS scores and their learning preferences, learning source preferences, study technique preferences, and reflective activity preferences.

## 4.1 Reliability of the SDLSS scores

In this part of the study, the reliability analysis findings for the SDLSS scores are presented. Cronbach's alpha coefficient for the internal consistency of scale items, indicating how well these items measure the same concept (Field, 2017). It is denoted by "α," with its values ranging from 0 to 1, where values closer to 1.0 signify higher reliability (Cronbach, 1951). Alpha represents the classical definition of reliability (DeVellis, 1991) The interpretation of Cronbach's alpha values is as follows: a coefficient below 0.50 suggests the scale is unreliable; values between 0.50 and 0.60 indicate low reliability; a scale is considered sufficiently reliable if the coefficient falls between 0.60 and 0.80, and highly reliable with values from 0.80 to 1.00 (Pışkın et al., 2014). Internal consistency interpretation based on Cronbach's alpha value is explained in Table 8 (Cronbach, 1951).

Table 8. Cronbach's Alpha Values

| Cronbach's Alpha value | Internal consistency |
|---|---|
| $\alpha \geq 0.9$ | Excellent |
| $0.9 > \alpha \geq 0.8$ | Good |
| $0.8 > \alpha \geq 0.7$ | Good and acceptable |
| $0.7 > \alpha \geq 0.6$ | Acceptable |
| $0.6 > \alpha \geq 0.5$ | Unacceptable / low reliability |
| $0.5 \geq \alpha$ | Poor / unreliable |

Furthermore, Cronbach (1951) posited that in instances where multiple factors are present, the formula ought to be utilized individually for items corresponding to disparate factors (Field, 2017). The reliability coefficients of Cronbach's alpha value for the total and factors of the SDLSS are detailed in Table 9.

Table 9. Cronbach Alpha of Subscales and Total Scale

| Subscales | Number of items | Cronbach alpha |
|---|---|---|
| Learning to learn | 6 | .65 |
| Learner autonomy | 7 | .62 |
| Self-motivation | 5 | .64 |
| Self-direction | 4 | .64 |
| Total Scale | 22 | .76 |

As delineated in Table 9, the Cronbach's alpha coefficients were computed for both the total score of the SDLSS and four subscale scores dimensions. The calculated Cronbach's alpha values manifested as 0.65 for the learning to learn

dimension, 0.63 for learner autonomy, 0.63 for self-motivation, and 0.63 for self-direction. The Cronbach's alpha value ascertained for the comprehensive scale stood at 0.76. According to the standards articulated in Table 10, alpha values ranging from 0.60 to 0.70 are deemed to represent acceptable levels of internal consistency, whereas values of 0.70 and above are considered both sufficient and satisfactory. Cronbach's alpha for the 22-item the SDLSS was .76, this can be considered adequate for research purposes; a closer examination of the scale item-total statistics indicated that no item should be removed to increase alpha.

Item-total correlation refers to the calculation of the relationship between the score of each item and the subscale scores. The correlation coefficient is expected to be at least 0.20 or 0.25. Büyüköztürk, Çakmak, Akgün, Karadeniz, and Demirel (2017) states that items with correlation coefficient values below 0.20 should be removed from the scale. In this study item correlation values in the scale vary between 0.23 and 0.71. This shows that the construct validity and reliability of the scale are moderate. The findings of the analysis are shown in Table 10.

Table 10. Item Analysis

| Items | Subscale | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|
| m30 | Learning to learn | .71 | .65 |
| m29 | | .44 | .35 |
| m25 | | .43 | .34 |
| m10 | | .46 | .34 |
| m18 | | .31 | .34 |
| m27 | | .51 | .32 |
| m2d* | Learner autonomy | .69 | .62 |
| m9d* | | .38 | .45 |
| m11d* | | .42 | .44 |
| m13d* | | .42 | .44 |
| m19d* | | .58 | .42 |
| m21d* | | .29 | .46 |
| m23d* | | .23 | .47 |
| m12 | Self motivation | .68 | .64 |
| m8 | | .45 | .41 |
| m20 | | .38 | .42 |
| m22 | | .50 | .40 |
| m4 | | .50 | .40 |
| m1 | Self direction | .62 | .64 |
| m24 | | .43 | .24 |
| m3 | | .43 | .25 |
| m17 | | .48 | .25 |

The correlation coefficients between individual item scores and the subscale scores ranged from .23 to .71. Şahin and Gülleroğlu (2013) have articulated that the coefficients of correlation between item scores and the total test score furnish

empirical evidence regarding the efficacy of items in measuring the construct purportedly assessed by the scale. While it is deemed optimal for the coefficient of item-total correlation to surpass .30 to ensure discriminative validity in identifying the intended trait, a coefficient as low as 0.20 is considered acceptable, according to Tavşancıl (2009). Consequently, it has been ascertained that, the items on the self-determined learning skills subscale exhibit discriminative power. Given these results, evaluating the association between self-determined learning skills subscale scores and learning preferences is advisable.

The SDLSS comprises 22 items, with 15 positive and seven negatively phrased items. It assesses the self-determined learning skills of adult learners who graduated from university and have a full-time job. Research has demonstrated the scale's validity and reliability for the tested sample. The items on the scale are in a five-point rating scale, with response options ranging from "never" (1) to "always" (5). Positive statements are scored from one to five, while negative items are reverse scored. Possible score range is 22 to 110 points. Higher scores indicate a greater frequency of engaging in vital self-learning skills. The scale has four sub-dimensions: learning to learn, learner autonomy, self-motivation, and self-direction.

## 4.2 Descriptive statistics

In the study the SDLSS conducted 273 participants, with the scores ranging from a minimum of 49 to a maximum of 104, thereby generating a mean average score of 84.54 (SD = 7.97). Analysis of the distribution revealed that 138 participants (constituting 50.5% of the sample) achieved scores below the mean, whereas 135 individuals (accounting for 49.5% of the sample) were above the mean.

Table 11. Descriptive Statistics of The SDLSS Scores

| Subscales | Min | Max | Mean | SD |
|---|---|---|---|---|
| Learning to learn | 16 | 30 | 26.23 | 2.48 |
| Learner autonomy | 7 | 34 | 25.73 | 3.91 |
| Self-motivation | 6 | 20 | 13.30 | 2.89 |
| Self-direction | 11 | 20 | 16.10 | 1.85 |
| Total Scale | 49 | 104 | 84.54 | 7.97 |

The results of the scale, in terms of four subscales (learning to learn, learner autonomy, self-motivation, and self-direction), provided insights into the participants' learning behaviors. The mean score for the learning to learn subscale was 26.23 (SD = 2.48), indicating that participants generally had confidence in their learning skills. Learner autonomy had a mean score of 25.73 (SD = 3.91), showing a strong sense of independence, though with more variability. Self-motivation scored lower, with a mean of 13.30 (SD = 2.89), revealing challenges in maintaining motivation. On the other hand, the self-direction subscale indicated a good level of self-direction in learning, with a mean score of 16.10 (SD = 1.85).

## 4.3 Finding about research questions

Since both the learning preferences questionnaire results and the SDLSS results were determined using the rating scale, Spearman's Rho was used to determine the relationship between them, as they both represent ordinal data to answer the research questions. In this context, findings related to the research questions are given below.

Research question 1: To what extent is there a relationship between learners' style preferences of adult learners and their scores on the Self-Determined Learning Skills Scale?

The research findings, the relationship between the SDLSS scores of adult learners and their preferred learning styles (including lectures, class discussions, group work, individual work, project-based learning) was explored to address the first research question.

Table 12 shows that the frequency distribution of responses to the learning style question indicates that the majority of respondents have a positive view of all learning styles. Individual work method was preferred more often than other methods. Specifically, 67% of the respondents indicated that often or always they preferred individual work methods. Additionally, 41% of the respondents often and 17% always agreed that they preferred project-based learning. On the other hand, lecture was least preferred method. Participants sometimes or less often preferred other three methods: 55% for lecture, 54% for class discussion 49% for group work.

Table 12. Learning Preferences Descriptive Statistics (N = 273)

| | Never (1) | | Rarely (2) | | Sometimes (3) | | Often (4) | | Always (5) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | F | % | F | % | F | % | F | % | F | % |
| Lecture | 10 | 4 | 49 | 18 | 91 | 33 | 106 | 39 | 17 | 6 |
| Class discussion | 4 | 1 | 44 | 16 | 73 | 27 | 128 | 47 | 24 | 9 |
| Group work | 9 | 3 | 43 | 16 | 83 | 30 | 109 | 40 | 29 | 11 |
| Individual work | 1 | 0 | 7 | 3 | 81 | 30 | 122 | 45 | 62 | 22 |
| Project-based | 12 | 4 | 29 | 11 | 74 | 27 | 112 | 41 | 46 | 17 |

After descriptive analysis, the Spearman's Rho correlation was used to measure the relationship between scores on the SDLSS and learning preferences. The Spearman's Rho correlation calculated between the variables, and the results are shown in Table 13.

Table 13. The Relation Between The SDLSS Scores and Learning Preferences

| | Total SDLSS | Lecture | Class discussion | Group work | Individual work | Project-based |
|---|---|---|---|---|---|---|
| Total SDLSS | | | | | | |
| Lecture | -.046 | | | | | |
| Class discussion | .17** | -.04 | | | | |
| Group work | .24** | -.16** | .42** | | | |
| Individual work | -.05 | .26** | -.12* | -.27** | | |
| Project-based | .27** | -.08 | .11 | .32** | .09 | |

** p < .01, *p < .05

When Table 13 is examined, it is seen that there is a statistically significant positive relationship between the SDLSS total scores of adult learners and the learning styles of class discussion preferences ($r_s$ = .17, $p$ < .01), the learning styles of group work preferences ($r_s$ = .24, $p$ < .01), project based preferences ($r_s$ = .27, $p$ < .01), while the results indicated that in the descriptive statistics, there is a slight variation in lecture and individual work. The variation is low since one of these styles is the least and the other is the most preferred method. As a result, there is no statistically significant correlation between SDLSS score and these learning preferences. In other words, as the self-determined learning skills total score increases, adult learners tend to prefer project-based, group work and class discussions more frequently. Adult learners who tend to prefer group work also favor

class discussions ($r_s$ = .42, $p$ < .01) and project based ($r_s$ = .32, $p$ < .01) as a learning style.

Research question 2: To what extent is there a relationship between the learning resource preferences of adult learners and their scores on the Self-Determined Learning Skills Scale?

In the examination of the second research question, an investigation into the disparity among adult learners' self-determined learning skill scores and their affiliation with preferred learning resources (websites, blogs, etc. accessed through search engines, reading materials (books, articles, etc.), videos, auditory tools such as podcasts, experts, and social media) was conducted. Results presented in Table 14

Table 14. Learning Resources Descriptive Statistics (N = 273)

| | Never (1) | | Rarely (2) | | Sometimes (3) | | Often (4) | | Always (5) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | F | % | F | % | F | % | F | % | F | % |
| Browser | 1 | 0 | 10 | 4 | 56 | 21 | 134 | 49 | 72 | 26 |
| Reading | 2 | 1 | 16 | 6 | 60 | 22 | 144 | 52 | 51 | 19 |
| Videos | 0 | 0 | 9 | 3 | 62 | 23 | 152 | 56 | 50 | 18 |
| Podcasts | 23 | 8.5 | 78 | 29 | 91 | 33 | 58 | 21 | 23 | 8.5 |
| Experts | 4 | 2 | 13 | 5 | 42 | 15 | 173 | 63 | 41 | 15 |
| Social media | 23 | 8 | 70 | 26 | 110 | 40 | 57 | 21 | 13 | 5 |

Upon examining their preferences for learning resources as presented in Table 14, the participants predominantly preferred for resources beyond social media platforms and podcasts, as delineated in the recommended resources list. Participants often and always preferred other learning recourses: 78% for experts, 75% for browser, 74% for videos and 71% for reading materials. A mere 26% of the participants reported that they often or always utilize social media as a learning tool.

In a similar vein, only 29.5% of the participants indicated often or always preference for using podcasts as a learning resource.

The measurement of the relationship between the scores on the SDLSS and the preferences for various learning resources was undertaken by employing the Spearman's Rho and the correlation between the variables was calculated, with the findings being presented in Table 15.

Table 15. The Relation Between SDLSS and Learning Resources Preferences

| | Total SDLSS | Browser | Reading | Videos | Podcasts | Experts | Social media |
|---|---|---|---|---|---|---|---|
| Total SDLSS | | | | | | | |
| Browser | .05 | | | | | | |
| Reading | .31** | .13* | | | | | |
| Videos | .10 | .45** | .24** | | | | |
| Podcasts | .26** | .05 | .31** | .24** | | | |
| Experts | .14* | .16* | .30** | .22* | .34** | | |
| Social media | .07 | .24** | -.06 | .18** | .20** | .21** | |

** p < .01, *p < .05

When the findings in Table 15 are examined, adult learners' SDLSS total scores and their learning source preferences as reading materials ($r_s$ = .31, $p$ < .01), listening materials such as podcasts ($r_s$ = .26, $p$ <.01), experts ($r_s$ = .14, $p$ < .05), it is seen that there is a statistically significant positive relationship. In addition, the results showed that the relationship between learners' SDLSS total scores and browser use, videos, social media preferences was not significant. In other words, as the SDLSS total score increases, adult learners tend to prefer reading materials, listening materials

and experts as a learning resource more frequently. Adult learners who tend to prefer experts also favor reading materials ($r_s = .30$, $p < .01$) and listening materials ($r_s = .34$, $p < .01$) as a learning resource.

Research question 3: To what extent is there a relationship between the study technique preferences of adult learners and their scores on the Self-Determined Learning Skills Scale?

For the third research question, the examination was on the relationships between adult learners' self-determined learning skills scores and their preferred study techniques.

As presented in Table 16, there is generally a favorable attitude towards the recommended study methods, except when collaborating with instructors and peers the respondents' study technic preferences. The most favored approach among the participants is watch/listen method, with 79% indicating that they often or always employ this method. Conversely, 79% of the participants do not strongly prefer working with an instructor. Similarly, only 31% indicated that they often or always prefer working with a peer.

Table 16. Study Technics Descriptive Statistics (N = 273)

| | Never (1) | | Rarely (2) | | Sometimes (3) | | Often (4) | | Always (5) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | F | % | F | % | F | % | F | % | F | % |
| Solving Question | 4 | 1.5 | 26 | 9.5 | 74 | 27 | 130 | 48 | 39 | 14 |
| Self-telling | 11 | 4 | 32 | 12 | 82 | 30 | 115 | 42 | 33 | 12 |
| Study on concepts | 4 | 1.5 | 15 | 5.5 | 85 | 31 | 132 | 49 | 37 | 14 |
| Repeating | 2 | 1 | 23 | 8 | 72 | 26 | 135 | 50 | 41 | 15 |
| Visualization | 4 | 1.5 | 16 | 6 | 61 | 22 | 129 | 47.5 | 63 | 23 |
| Highlighting | 7 | 3 | 25 | 9 | 62 | 22 | 114 | 42 | 65 | 24 |
| Study with instructor | 18 | 7 | 58 | 21 | 112 | 41 | 71 | 26 | 14 | 5 |
| Summarizing | 9 | 3 | 18 | 7 | 64 | 23 | 123 | 45 | 59 | 22 |
| Watch & listen | 1 | 0 | 7 | 3 | 50 | 18 | 153 | 56 | 62 | 23 |
| Study with peers | 8 | 3 | 48 | 18 | 96 | 35 | 97 | 35 | 24 | 9 |

The measurement of the strength and direction of the relationship between total scores on the SDLSS and preferences for various learning techniques was conducted through the Spearman's Rho and the findings are presented in Table 17.

Table 17. The Relation Between SDLSS Scores and Study Technique Preferences

| | Total SDLSS | Solving Question | Self-telling | Study on concepts | Repeating | Visualization | Highlighting | Study with intructor | Summarizing | Watch & listen | Study with peers |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total SDLSS | | | | | | | | | | | |
| Solving Question | .15* | | | | | | | | | | |
| Self-telling | .16** | .20** | | | | | | | | | |
| Study on concepts | .20** | .22** | .39** | | | | | | | | |
| Repeating | .12* | .23** | .40** | .42** | | | | | | | |
| Visualization | .27** | .12* | .13* | .19** | .22** | | | | | | |
| Highlighting | .18* | .07 | .24** | .24** | .38** | .22** | | | | | |
| Study with intructor | .09 | .02 | .09 | .09 | .08 | .14* | .08 | | | | |
| Summarizing | .19* | .09 | .23** | .18* | .32** | .34** | .34** | .21** | | | |
| Watch & listen | .10 | .08 | .01 | .09 | .15* | .19 | .17* | .13* | .25** | | |
| Study with peers | .19* | .10 | .13* | .14* | .06 | .22** | .18** | .38** | .17** | .15* | |

** p < .01, *p < .05

The study techniques preferences used for the research question are studying by solving questions, self-telling, studying concepts, re-reading, visualizing, studying by underlining, working with the instructor, summarizing, listening/watching, working with peers and groups. The findings in Table 17 show that adult learners' SDLSS total scores were associated with solving question ($r_s$ = 0.15, $p$ < 0.05), self-telling ($r_s$ = 0.16, $p$ < 0.01), studying with concepts ($r_s$ = 0.20, $p$ < 0.01), visualization ($r_s$ = 0.27, $p$ < 0.01), repeating ($r_s$ = 0.12, $p$ < 0.05) summarizing ($r_s$ =

0.19, $p < 0.05$), and study with peers ($r_s = 0.19$, $p < 0.05$), there is a statistically significant positive relationship. In other words, as the SDLSS total score increases, adult learners tend to prefer solving questions, self-telling, studying with concepts, visualization, repeating, summarizing and study with peers more frequently. In addition, the results also showed that the relationship between adult learners' the SDLSS total scores and other recommended techniques (study with instructor, watch and listen) was insignificant.

Research question 4: To what extent is there a relationship between adult learners' preferences for reflective activities and their scores on the Self-Determined Learning Skills Scale?

In the descriptive analysis of the participants, it is evident that they have positive attitudes towards organizing their learning, setting goals, and working on concepts. Although other options are occasionally used, recording the item (preferred by 36% of the participants often or always) and visualization (preferred by 38% of the participants often or always) are the least favored self-reflective activities.

Table 18. Self-reflective Activities Descriptive Statistics (N = 273)

| | Never (1) | | Rarely (2) | | Sometimes (3) | | Often (4) | | Always (5) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | F | % | F | % | F | % | F | % | F | % |
| Records | 43 | 16 | 55 | 20 | 75 | 28 | 72 | 26 | 28 | 10 |
| Organize learning | 7 | 3 | 31 | 11 | 53 | 19 | 125 | 46 | 57 | 21 |
| Setting goals | 10 | 4 | 32 | 12 | 66 | 24 | 118 | 43 | 47 | 17 |
| Concepts | 1 | 0 | 16 | 6 | 81 | 30 | 140 | 51 | 35 | 13 |
| Visual formatting | 25 | 9 | 60 | 22 | 85 | 31 | 80 | 29 | 23 | 9 |
| Expert feedback | 11 | 4 | 50 | 18 | 92 | 34 | 103 | 38 | 17 | 6 |
| Peer feedback | 4 | 1.5 | 45 | 16.5 | 87 | 32 | 118 | 43 | 17 | 6 |

The Spearman's Rho correlation was used to measure the relationship between the self-determined learning skills scale and preferences for various self-reflective activities and the findings obtained from the calculation are presented in Table 19.

Table 19. The SDLSS Scores and Self-reflective Activities

| | Total SDLSS | Records | Org. learning | Setting goals | Concepts | Visual formatting | Expert feedback | Peer feedback |
|---|---|---|---|---|---|---|---|---|
| Total SDLSS | | | | | | | | |
| Records | .23** | | | | | | | |
| Organize learning | .35** | .52** | | | | | | |
| Setting goals | .34** | .38** | .53** | | | | | |
| Concepts | .27** | .27** | .33** | .43** | | | | |
| Visual formatting | .34** | .28** | .33** | .27** | .25** | | | |
| Expert feedback | .25** | .34** | .25** | .31** | .30** | .21** | | |
| Peer feedback | .15* | .19** | .15* | .28** | .17** | .10 | .52** | |

** $p < .01$, * $p < .05$

The calculation results showed that there was a positive and statistically significant relationship between adult learners' self-determined learning skills scores and recommended self-reflective activity preferences. In short, the higher the total SDLSS score, the more likely one is to prefer the recommended self-reflective activities.

Self-reflection is a crucial part of self-determined learning and metacognition, strengthening the connection between the two. Self-reflection involves looking inwardly to examine one’s thoughts, actions, and experiences about their learning

journey (Blaschke, 2012). In the context of heutagogy, self-reflection is essential as it allows learners to critically assess their learning journey, identify strengths and weaknesses, and make adjustments to their learning strategies.

When learners participate in metacognitive activities, such as planning how to approach a topic, setting goals, monitoring their progress, and evaluating the effectiveness of their strategies with expert or peer feedback, self-reflection is inherently involved. This reflective process helps learners become more aware of how they learn, which is central to the heutagogical approach emphasizing learner autonomy (Blaschke, 2012).

In essence, self-reflection heightens metacognitive awareness, empowering learners to take charge of their learning, adapt their strategies as necessary, and engage more deeply in the self-determined learning process advocated by heutagogy. The findings of this study emphases that higher SDLSS scores indicate that self-reflective activities are more preferred, it was decided to conduct a detailed analysis within the subscales.

The Spearman's Rho correlation was also used to measure the relationship between the subscales (learning to learn, learner autonomy, self-motivation and self-direction) and preferences for various self-reflective activities and the findings obtained from the calculation are also shown in Table 20.

Table 20. The SDLSS Sub-scores and Self-reflective Activities

| | Learning to Learn | Learner Autonomy | Self-Motivation | Self-Direction |
|---|---|---|---|---|
| Records | .13** | .02 | .23** | .25** |
| Organize learning | .30** | .10 | .26** | .29** |
| Setting goals | .27** | .15** | .16** | .30** |
| Concepts | .22** | .06 | .13* | .40** |
| Visual formatting | .25** | .15* | .31** | .26** |
| Expert feedback | .16** | .07 | .30** | .17** |
| Peer feedback | .15* | .02 | .14** | .02 |

The Spearman's correlation results revealed positive and statistically significant relationships between given self-reflective activities and self-determined learning skills scale and subscales' scores. Specifically, organizing learning ($r = .35$, $p < .01$), setting goals ($r = .34$, $p < .01$), and visual formatting ($r = .34$, $p < .01$) demonstrated strong correlations with the total SDLS score. These activities also showed moderate correlations with specific SDLSS components, such as learning to learn and self-motivation. For instance, "Organizing learning" was significantly correlated with learning to learn ($r = .30$, $p < .01$). At the same time, "Visual formatting" had a moderate correlation with self-motivation ($r = .31$, $p < .01$). Additionally, self-direction was strongly correlated with "Concepts" ($r = .40$, $p < .01$). These findings show that structured and goal-oriented self-reflective strategies are closely associated with higher levels of self-determined learning skills.

## 4.4 Analyzes addressed outside of research questions

In addition to the research questions, additional analyses were conducted to enhance the study using the data obtained. These analyses are explained briefly below.

### 4.4.1 The relationship between demographic info and the SDLSS

A point-biserial correlation was calculated to evaluate the relationship between the self-determined learning skills score of adult learners and the age variable, no statistically significant relationship was observed. When the participants' age and subscale scores are compared, the results indicated that the relationship between the learning to learn score and age was a positive and statistically significant relationship ($r_{pb}$= .14, $p$ < .05). However, there is no statistically significant relationship between other subscales and age.

In addition, when looking at the relationship with years of work experience, there was a statistically significant positive relationship between adult learners' full-time work experience and their self-determined learning skills scores ($r_{pb}$ = .12, p< .05). In addition to the total score, according to the sub-categories, the analysis was carried out, and the analysis shows a positive and statistically significant correlation between full-time work experience and learning to learn ($r_{pb}$ = .14, $p$ < .05) and self-direction ($r_{pb}$ = .12, $p$ < .05) scores. Whereas no statistically significant relationship was found with the others (learner autonomy and self-motivation).

### 4.4.2. Attended trainings numbers and the SDLSS score

Among the questions asked of the participants was the number of training programs (workshops, seminars, courses, etc.) they attended in the last year. When the number of training the participants attended was compared with their SDLS scores with

Pearson correlation coefficient method, there was a positive and statistically significant ($r$ = .17, $p$ < .01) relationship. Similarly, when analyzing the relationship between subscale scores (Leaning to learn, learner autonomy, self-motivation and self-direction) and number of trainings, it was calculated that learning to learn scores ($r$ = .15, $p$ < .01) and self-direction scores ($r$ = .14, $p$ < .01) also had a statistically significant relationship.

4.4.3. Graduated faculty and the SDLSS score

A one-way between-groups analysis of variance (ANOVA) indicated to explore the influence of graduation faculty on the self-determined learning scores of adult learners. The comparison was made between the three faculties (education, arts and science, engineering), with the highest number of participants based on the graduated faculties. Prior to conducting the ANOVA, the researchers confirmed that the normality and homogeneity of variance assumptions were met. The ANOVA revealed a significant difference in mean scores across the faculty specializations (education, arts and science, engineering), indicating that the mean score of at least one group was different from the others. Post hoc pairwise comparisons using the Tukey HSD test were conducted to further examine these differences.

Specifically, the mean score difference between the education and arts and science faculty groups was found to be not statistically significant (M = 1.35, SE = 1.25, $p$ = .701). Conversely, the comparison between the education and engineering faculty groups showed a significant mean difference (M = 5.22, SE = 1.25, $p$ < .001). The arts and science faculty group did not significantly differ from the education faculty group (M = -1.35, SE = 1.25, $p$ = .701).

In contrast, the comparison between the arts and science and engineering groups yielded a statistically significant difference (M = 3.87, SE = 1.35, $p$ = .023). Furthermore, the engineering faculty group differed significantly from both the education faculty group (MD = -5.22, SE = 1.25, $p$ < .001) and the arts and science faculty group (MD = -3.87, SE = 1.35, $p$ = .023).

These findings suggest that the engineering faculty group has significantly different mean scores compared to both the education and arts and science faculty groups, while the differences between the education and arts and science faculty groups were not statistically significant.

In short, the SDLSS scores of the participants who graduated from engineering faculties were higher than the participants who graduated from other faculties. This indicates that engineering faculties may be more compatible with the skills, knowledge or attitudes measured by the scale. Additionally, the effect size for the engineering faculty group was determined to be d = 0.79, indicating a large effect size according to Cohen's criteria (Muller & Cohen, 1989).

### 4.4.4. Occupation and the SDLSS score

In addition to the faculty from which they graduated, the relationship between the participants' current professions and SDLSS was also examined. For this purpose, occupational groups with at least ten participants (teacher, engineer, salesperson, doctor, e-commerce specialist, and analyst) were selected.

A one-way between-groups analysis of variance (ANOVA) indicated to explore the influence of occupation on the self-determined learning scores of adult learners. Before conducting the ANOVA, the researchers confirmed that all assumptions were met.

An ANOVA was executed to investigate the impact of various professions on self-determined learning skill scores. The analysis yielded a significant main effect, $F(5, 218) = 9.98$, $p < .001$, suggesting notable differences in the outcome variable across the profession groups. Subsequent post hoc analyses employing Tukey's HSD test were conducted to clarify the nature of these differences among specific profession pairs.

The results of the post hoc analyses revealed that individuals in the teacher category exhibited significantly higher scores compared to their counterparts in the engineer, sales and doctor professions, with mean differences of 7.18, $p < .001$; 6.83, $p = .012$; and 8.06, $p = .015$, respectively. Additionally, a further comparison indicated that those identified as engineer scored significantly lower than individuals in the analyst category, with a mean difference of -7.87, $p = .018$. It should be noted that no other pairwise comparisons reached statistical significance, $p > .05$. Moreover, the effect size for the teacher profession was determined to be $d = 0.82$, indicating a large effect size according to Cohen's criteria (Muller & Cohen, 1989).

These findings show a distinct variance in the outcome variable attributed to the professional roles of the participants. Such inconsistencies underscore the potential influence of professional background on the measured outcome, thereby contributing to the existing body of knowledge within the field. Further research is warranted to explore the underlying mechanisms that may account for these differences.

### 4.4.5. Learning environment preferences and the SDLSS score

An analysis was performed to investigate the variances in the SDLSS scores among adult learners with differing preferences for learning environments (online, face to face and hybrid). Utilizing a one-way ANOVA, the investigation found no statistically significant differences in SDLSS scores across the groups, with an $F(2, 270) = 0.626$, $p = .536$. Furthermore, the effect size, quantified by partial eta squared, was minimal, indicating that in this sample, the preferences for learning environments do not markedly influence SDLSS scores.

# CHAPTER 5

# DISCUSSION & CONCLUSION

The findings of this study are discussed in this section based on the literature on the relationship between adult learners' self-determined learning skills scores, learning preferences and demographic characteristics. The SDLSS and learning preferences questionnaire were conducted online with 273 participants, and data was collected. The aim was to explore the relationship between self-determined learning skills and the learning preferences of adult learners. The participants were graduate adults from various universities who were employed full-time and had attended at least one training program in the previous year. To ensure diversity, participants from any occupation were included.

## 5.1 Key findings

This section includes key findings and a summary of the main results related to the research questions. Firstly, the study conducted validity and reliability analyses of the self-determined learning scale for adult learner participants. The study concluded that the scale was a valid and reliable tool for the study sample.

The analyses were then conducted for the research questions. For the first research question, the study examined the relationship between adult learners' self-determined learning skills and their learning preferences. It was observed that adult learners with higher self-determined learning skill scores preferred project-based learning, group work, and class discussions.

Next, the study looked at the relationship between adult learners' self-determined learning skills and their learning resource preferences. It found that as

adult learners' self-determined learning skill scores increased, they tended to prefer reading materials, listening materials, and learning from experts more frequently.

The study also examined adult learners' preferences for study techniques in relation to their self-determined learning skill scores. It observed that as the self-determined learning skill scores of adult learners increased, they preferred study techniques such as solving questions, self-testing, studying concepts, visualization, repetition, summarization, and studying with peers.

For the last research question, the study explored the relationship between adult learners' self-determined learning skill scores and their self-reflective activity preferences. It found that adult learners with high scores frequently used and preferred all self-reflective activities.

In additional analyses, no statistically significant relationship was found between the self-determined learning skills score and the age of the adult learner. However, a statistically significant and positive relationship was found between professional experience, the number of trainings attended, graduated faculty, profession and the self-determined learning skills score.

## 5.2 Results and contributions

In this section, the findings in terms of theory and preferences are discussed separately.

### 5.2.1 The SDLSS for adult learners

An analysis of internal structure of the self-determined learning skill scale for the target population was conducted by the examination of factor loadings on learning to learn, learner autonomy, self-motivation, and self-direction factors. Despite these findings being in alignment with those from the original study conducted by Sarkın and Seçkin (2023), discrepancies in the allocation of four items across different factors were noted. Specifically, three items were categorized differently between the factors of learning to learn and self-direction from the original study.

In the determination of the factors, it was highlighted by the literature review the basic guidelines had been established by Blaschke and Hase (2015), which incorporated considerations of human agency, capability development, self-reflection/metacognition, non-linear teaching-learning, single and double-loop learning. This framework identified the overlap between the learning-to-learn factor and the double-loop learning dimension, as well as between the self-direction and the self-reflection (metacognition) dimension (Sarkın & Seçkin, 2023).

It was mentioned by Tagg that double-loop learning allows for the problem to be taken as a transition and for the curriculum to be re-evaluated in terms of how it works and what it is for, because the curriculum should be about what should learn rather than what the instructors teaches (Tagg, 2010). Therefore, for double-loop learning management, metacognition and self-reflection are required since knowledge and regulations about cognitions (planning the learning path, monitoring performance, organizing learning, and evaluating learning outcomes) for individual learning are evaluated by metacognition (Öztürk, 2017). In other words, to evaluate not only the result but also the outcome, these two concepts become essential to each other. Items 17 (I can incorporate my new learning method using the experience I

have gained from my previous learning.) and item 24 (Throughout my learning processes, I can identify the skills and competencies that are open to improvement.) , which were included in the learning to learn factor in the original study, were evaluated in the self-direction factor in this sample.

Both double loop learning, and self-direction emphasize the importance of reflection in learning. In self-direction, learners must reflect on their needs and progress (Garrison, 1997). Double-loop learning takes this further by requiring reflection on the very frameworks guiding their decisions.

As a result, when examining the relationship between subscales in this study, a statistically significant relationship was found between the scores of the "learning to learn" and the "self-direction" scores. This may have led to the overlap of items 17 and 24, and their categorization as subscales in different factors than in the original study.

Moreover, in the original study (Sarkın & Seçkin, 2023), item 4 was part of the self-direction subscale, but in this study, it was included in the self-motivation subscale. Self-motivation is linked to the non-linear learning dimension, which is one of the elements of heutagogy (Sarkın & Seçkin, 2023). Blaschke (2016) mentioned that heutagogy recognizes the differences in each learner's experiences and paths, and this principle considers learning to be a process of discovery by the learner. Garrison's comprehensive model for self-direction involves three interconnected dimensions: self-management, self-monitoring, and motivation (Garrison, 1997). He stresses that these dimensions are interdependent and should be assessed collectively. The learner's motivation significantly influences goal setting, the creation of an appropriate plan to achieve the goal, and the decision-making process for implementation (Garrison, 1997). Therefore, the learning paths that can be preferred

and the choices to be made in the learning process are included in non-linear learning. For item 4 (I easily communicate with people who I think will contribute to my learning process.), it is meaningful to exchange its placement between the self-motivation and self-direction subscales.

In conclusion, the SDLSS used in this study is a valid and reliable tool for the sample. However, the differences in the items determined for the subscale measurements suggest that the scale may benefit from evaluation with a larger number of participants, providing an opportunity to improve its applicability for adult learners.

### 5.2.2 Understanding learning preferences of adult learners

The study aimed to explore the relationship between adults' learning preferences and the heutagogical design elements described by Hase (2015), with an objective to shed light on the learning preferences of learners who are capable, creative, and self-determined. These elements shown in Figure 5.

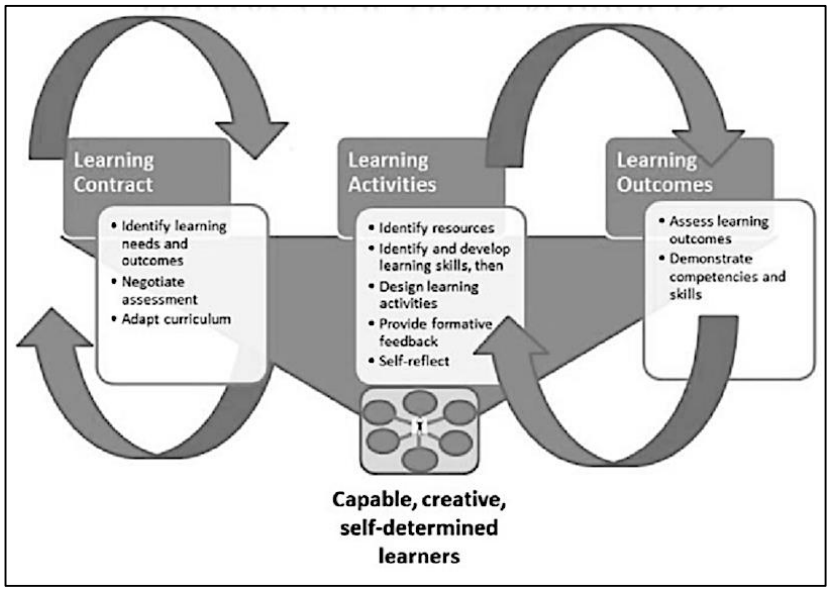



Figure 5. Heutagogy design elements (Hase, 2025)

Hase (2015) posited that in designing heutagogical learning elements, identifying the source should precede the design of learning activities (Hase, 2015). Within this framework, the findings are intended to inform the creation of learning programs employing a heutagogical approach. While the study does not propose specific learning preferences to enhance self-determination skills, it offers insights into the preferences of learners with high SDLSS scores. Thus, the goal is not necessarily to adopt these learning activities directly but to recognize that they are preferred by learners with high scores.

As a result, this part of the study primarily examined how learning preferences were related to SDLSS scores. The study found that while individual study style is widely preferred by adult learners, there is no statistically significant relationship between this method and SDLSS scores. Lecture is not a preferred method either, and there is no statistically significant relationship between it and SDLSS scores. The reason behind this result can be unlike other recommended methods, the learning outcomes of these methods are not clear. Kolb (1985) mentioned that concrete and reflective experiences are practical in the learning process, while Lee et al. (2000) highlighted the importance of providing opportunities for adult learners to reflect on their past and professional experiences in their learning preferences. The study suggests that class discussion, group work, and project-based learning styles yield better results compared to others, possibly because these activities provide adults with opportunities to reflect on their experiences. In light of the findings, it has been revealed that the selection of learning methods allowing adult learners to create learning outcomes that reflect their past learning and experiences may be linked to self-determined learning skills.

The findings about the preferences of learning sources for adult learners, it has been observed that while social media and podcasts are not widely favored, adults do use all sources at times. However, the preference for reading, experts, and podcasts among the recommended sources has a statistically significant relationship with SDLSS scores. When suggesting learning sources, three main factors were taken into account: individual characteristics, technological considerations, and content relevance (Bates, 2015). Among these, content relevance and the content are the primary considerations when choosing reading materials, podcasts, and experts (Bates, 2015). In this study the findings indicate that adults tend to engage with all recommended types of resources and place more emphasis on content features. Although, the ability to make choices regarding content in learning objectives is associated with non-linear learning (Blaschke, 2016) and may impact SDLSS scores.

In terms of learning preferences, the study also looked at the study techniques preferred by adult learners. It was found that participants showed less tendency for working with instructors and peers. Additionally, there was no statistically significant relationship observed between working with instructors, watching, and listening techniques and the SDLSS score. The recommended study techniques were chosen based on their effectiveness and creativity (Dunlosky et al, 2013). Participants may prefer techniques such as visualization and summarization because they offer a more creative approach to learning. It is possible that participants do not prefer working with a peer or instructor due to the difference in productivity between working independently and with someone else. Therefore, there may be a connection between SDLSS scores and methods that allow learners to work independently and reinforce learning by presenting it in different ways.

One of the significant findings of this research is the statistically significant relationship between the self-reflective activity preferences of adult learners and their SDLSS scores. All the activities suggested in the survey were highly preferred by adult learners. In the heutagogic approach, learner autonomy is a crucial element, giving the learner full control over the learning process (Blaschke, 2016). This autonomy is particularly important for individuals with strong self-assessment and metacognition skills, enabling them to better manage their own learning responsibilities. Although self-evaluation and metacognition have an essential place in studies prepared and implemented with the self-determined learning approach, studies indicate that it is an area that needs to be developed. Again, some research shows that reflective techniques can help students consolidate and evaluate what they have learned about a discipline and its applications (Mezirow, 1994). Bahar Şahin Sarkın and Gökçe Güvercin Seçkin identified self-direction as one of the four factors they used when developing the SDLSS and drew attention to the elements of reflection, and metacognition emphasized in the heutagogical approach (Sarkın and Seçkin, 2023). Anning and Callan, in their study in 2010, found that reflective practice leads to greater motivation and participation by helping students take control of their learning and apply knowledge in real-world situations (Canning and Callan, 2010). A study noted that one of the significant difficulties in using the heutagogical approach is that students do not have self-evaluation skills (Tiew and Abdullah, 2021).

In designing learning programs, adult learners need to develop the skill of evaluating their own learning (self-evaluation, self-direction). This skill is crucial, and it's important to create opportunities for learners to demonstrate and evaluate their own learning in learning designs. As a result of this research, upon examining

the correlation between subcategories and self-reflective activities, it was observed that competencies in organizing learning, setting goals, and visualizing learning progress were significantly elevated in adult learners who exhibited high scores on all subscales. These results illuminate the necessity for adults to conceptualize their learning outcomes in diverse modalities and from a holistic perspective to cultivate self-determination in their learning journey. Additionally, based on the findings, the highest correlation appears to be with self-direction in relation to self-reflective activities, whereas the weakest correlation is with learner autonomy. Learner autonomy is related to the capacity of learners to take control of their learning journey. It requires learners to take responsibility for determining learning goals, choosing learning methodologies, managing their time effectively, and evaluating their progress. Autonomous learners are self-directed, actively seek resources, reflect on their learning experiences, and adjust their approaches to achieve their goals. It is compatible with and necessary for approaches such as self-determined learning (heutagogy), which see learners as primary agents in the learning process and develop the skills to learn independently and critically evaluate information (Blaschke, 2019). Therefore, the weak correlation between self-reflective activity preferences and the learner autonomy subcategory should be examined in further studies. So, the data gains form this study made a significant contribution to supporting about self-determined learning, where individuals take responsibility for their own learning, requires high self-direction skills.

### 5.2.3 Workplace and life-long learning

The relationship between education and the labor market has sparked extensive debate among educators, economists, policy makers, and sociologists. The debate revolves around the purpose of education, with some advocating for a direct alignment of education with the needs of the market to enhance economic convenience and employability. Others support a more holistic approach focused on personal and social development.

The Human Capital Theory suggests that investing in education increases the productivity and earnings of individuals, benefiting the economy (Becker, G. S., 1994). Critics argue that a labor market-oriented approach might lead to a narrow focus on vocational skills at the expense of broader education, neglecting critical thinking, creativity, and civic engagement.

On the other hand, opponents of this model believe that education should not be reduced to job preparation alone and should emphasize personal development, critical thinking, and civic engagement. They advocate for a broad-based education that encourages adaptability and lifelong learning, essential in a rapidly changing world (Jover et al., 2018).

Balancing models have also emerged, emphasizing the importance of education serving both the labor market and broader societal goals. While it is crucial for education to meet labor market demands, it should not do so at the expense of other educational goals (Whiting & Martin, 2020).

In the midst of these discussions encouraging individuals to take responsibility for their own learning and become self-determined learners can contribute significantly to both workforce readiness and comprehensive education. Self-determined learners can adapt quickly to changes in the labor market, remain

competitive, and contribute to economic growth. They also become more engaged and informed citizens, supporting democratic participation and social justice. By managing their own learning, individuals can develop skills that align with labor market demands and participate in broader educational experiences that encourage critical thinking, creativity, and active citizenship. Taking responsibility for their learning increases individuals' sense of responsibility and self-efficacy, leading to greater motivation and active participation in both their education and careers. Promoting self-directed learning can help education systems meet both the immediate needs of the labor market and the broader goals of comprehensive education, benefiting individuals, the workforce, and society.

The balancing approach may seem to provide an acceptable solution, but it also risks overloading the learner. At this stage, having highly self-determined learning skills emphasizes the importance of self-direction and autonomy. One of the key findings of this research is that possessing high self-determined skills can enhance individuals' ability to accurately evaluate their learning processes and take appropriate action. This study helps us understand that self-determined learning skills are crucial for the development of individuals who can positively impact the social and personal outcomes of education.

### 5.2.4 Graduated faculty, profession and the SDLSS score

One particularly notable finding in this study relates to the statistically significant relationship observed between the faculties from which adult learners graduated and their self-determined learning skills scores. This analysis reveals that for engineering graduates, the marked rise in SDLSS scores is primarily attributable to the educational background inherent in their graduation degree. In contrast, for

individuals engaged in the teaching profession, the increase in SDLSS scores appears to be heavily influenced by their professional practice rather than their graduated faculty.

These findings may call into question whether instruction in approaches to learning in university settings has an impact on the acquisition of self-determined learning skills. In particular, it warrants further research on whether the learning approaches and educational content courses delivered to prospective educators directly contribute to the advancement of SDLSS and, if so, why the increase in these skills is not evident among graduates of education faculties. Furthermore, this phenomenon may indicate that educators' leadership of learning in the professional context simultaneously improves their SDLSS or, alternatively, that there are other underlying factors that contribute to this improvement that need to be further examined. In addition, it can be discussed whether the university that graduated makes a difference here.

Therefore, a comprehensive investigation addressing these queries is warranted. The findings from such research could significantly illuminate the processes underlying the development of SDLSS, providing critical insights into the optimization of educational strategies aimed at fostering these essential competencies among future educators and professionals alike.

## 5.3 Limitations

The limitations of this study are multifaceted and warrant careful consideration. Firstly, Kline explains that Exploratory Factor Analysis (EFA) is pivotal in exploring and developing initial models (Kline, 2015). In contrast, Confirmatory Factor Analysis (CFA) is indispensable for confirming hypothesized factor structures and

rigorously evaluating measurement models. Nevertheless, he highlights instances were proceeding directly to CFA may not be warranted if the scale in question has been well-established through precedent research or if the investigative focus is geared towards exploring the overall factor structure instead of validating a specific theoretical model across varied samples (Kline, 2015). The primary aim of the present study is to investigate the correlation between scale results and learning preferences amongst adult learners, eschewing the validation of the theoretical model with the results garnered from the scale. Consequently, EFA was employed for the scale within this study, while the application of CFA was foregone. In addition, it is recommended to consider a different research group for the CFA application. Furthermore, the number of participants in the study group is limited. Out of the 341 participants who responded to the scale and questionnaire, data from 273 were deemed usable for analysis. Exploratory Factor Analysis (EFA) was conducted utilizing this dataset. However, the sample size did not meet the required threshold to proceed with Confirmatory Factor Analysis (CFA), due to the inability to reach a sufficient number of participants.

One of the aims of the study was creating meaningful participant groups using cluster analysis. Since groups at the desired level could not be formed as a result of cluster analysis, alternative statistical methods were utilized to interpret the demographic information and scale results. A study in a more homogeneous group could have supported obtaining clearer results.

Moreover, the methodology employed, specifically the use of rating-scale based instruments, relies heavily on self-reported data. This reliance introduces the potential for generalized responses, as participants may not have provided specific insights into their reasoning or the contexts influencing their perspectives.

Additionally, the deployment of the survey in an online format presents further limitations. The anonymity and accessibility of the online survey may have allowed for responses from individuals outside the intended sample population, thereby introducing extraneous variables. Furthermore, the lack of control over the survey environment means that the interpretation of questions by participants and the context in which they responded remain unknown, potentially affecting the validity of the data collected.

## 5.4 Recommendations for future studies

The fact that the heutagogical approach can be applied by learners and the individual taking responsibility for and managing his/her learning has become an essential skill, especially in the twenty first century. In this context, suggestions for further studies to improve individuals' self-determined skills may be as follows:

The field of self-determined learning skills in adults is still in its early stages, leaving plenty of room for further studies. Many factors influence adult education, including learners' educational, family, and work backgrounds. The self-determined learning approach underscores the cultivation of an individual's autonomy over their learning trajectories, promoting a sense of self-agency and the acquisition of skills pertinent to lifelong learning. Given its new emerging situation, the field holds substantial promise for expansive research endeavors to elucidate its practical applications, merits, challenges, and optimal practices across diverse educational and professional contexts. Key avenues poised for further scholarly investigation encompass:

The efficacy on adult learning outcomes: This involves a rigorous analysis of the extent to which self-determined learning skills influence the motivational levels,

engagement, and educational outcomes of adult learners in comparison to more traditional approaches.

Technological development: An in-depth exploration concerning the integration of digital frameworks and online platforms in supporting self-determined learning, alongside an assessment of the most effective technologies that facilitate this educational philosophy. In this study, although the difference in learning environment (online, face to face, hybrid) does not seem to be effective on SDLS scores, adult learning programs in Türkiye where technological tools use is available or only traditional methods are preferred can be compared.

Curriculum Design: The process of formulating and empirically evaluating curricula that embed principles of self-determined learning, with an emphasis on pinpointing the most efficacious strategies tailored for distinct arenas of study or professional advancement.

Assessment and self-reflection: The development and empirical validation of assessment techniques that resonate with self-determined learning's core tenets, with a focus on fostering learners' competencies in self-appraisal and progress reflection.

Longitudinal research: Conducting extended longitudinal inquiries to gauge the enduring effects of self-determined learning on professional growth, personal development, and the perpetuation of lifelong learning inclinations.

By understanding the connection between adults' learning preferences and high self-determined learning scores, online and face-to-face programs can design that addressed to these preferences. This kind of program can be developed, and practice analysis can be conducted to improve self-determined learning skills for adult learners and collect implementation result practical data locally. Also, evaluating adults' self-determined learning scores before and after participating in

these programs can provide insights into adult learning. Furthermore, experimental studies can help us better comprehend the relationship between pedagogic skills and learning dynamics.

Moreover, a study can be conducted to obtain detailed opinions about how they manage their learning processes and their preferences by conducting structured interviews with adult learners who have high self-determination skills.

## 5.6 Conclusion

This study aimed to explore the connection between scores in self-determined learning skills and the learning preferences of adult learners. Understanding this relationship is vital for developing effective adult learning programs and for gaining insights into the preferences of adult learners as they strive to become lifelong learners.

The study involved administering the self-determined learning skills scale to assess the learning skill scores of 341 adult learners. Subsequently, a questionnaire was used to investigate the correlation between the scores in self-determined learning skills and learning preferences. The findings were then analyzed in the context of existing literature.

The primary research question of this study comprises four specific inquiries aimed at understanding the relationship between self-determined learning skill scores and the learning preferences of adult learners.

When examining the learning preferences of adult learners, it's been observed that although they generally prefer to work individually, individuals with highly self-determined learning scores tend to favor project-based studies and class discussions. So, it's important to incorporate project-based studies and class discussions into

instructional designs for adult learners with high self-determined learning skills scores, as well as to provide such learning opportunities.

Although adult learners are open to using diverse learning sources, the number of those who use social media tools as a source is low. Participants with high self-determined learning skills scores tend to prefer listening tools such as podcasts and learning from experts as their primary sources. It's interesting to note that individuals with high skills in taking responsibility for their own learning prefer experts and podcasts as sources in today's world, where there is a high diversity of information sources. The high diversity of information is criticized for causing information pollution and making it challenging to access target information. These challenges may have led learners to experts in terms of difficulties in sorting information and questioning the reliability of the information. This issue may have been assessed in conjunction with other learning preferences, possibly resulting in adult learners preferring experts for acquiring knowledge, discussing, and evaluating knowledge in their learning processes.

An important point to note here is that the relationship between adult learners' preference for experts as a source of learning and the instructor's role cannot be explained with this finding. This study indicates that experts are heavily preferred as a source of learning, but it doesn't clarify whether the instructor is considered an expert or not. This shouldn't be linked to the role and duty of the instructor in the self-determined learning approach.

When it comes to study techniques, adult learners are willing to use many different methods, but they rarely prefer to work with experts. Similarly, while watching and listening materials are often chosen as learning sources, they are not usually preferred when it comes to study techniques. Instead, techniques such as

question-solving, self-telling, summarizing, repetition (individually and with peers), visualization, and working with concepts are favored. These techniques enable learners to be more active themselves and have been found to be linked to self-determined learning skills. It's important to include elements that support these study techniques in adult learning programs. Encouraging individuals to use these techniques in formal education and training processes will contribute to the development of self-determined learning skills.

Based on this study, it was found that there is a clear and strong link between self-determined learning skills and the use of self-reflection activities. In the self-determined learning approach, some key principles include learner agency, capability, non-linear learning, and reflection/metacognition (Blaschke, 2015). All of these principles are based on the learner's autonomy, which means their ability to decide their own learning path. To do this, learners need the skills to assess and reflect what they have learned and what they have not, and to be able to use self-reflection activities in the learning process. The study revealed that the most preferred self-reflection activities are organized learning, setting goals, and working with concepts. These preferences are integral as they furnish robust reflective instruments which empower adult learners to identify and engage with their learning needs.

In addition, the study indicates there is no statistically significant relationship between the demographic information (such as age, and learning environment preferences) of the participants, except for their professional experience, graduated faculty, occupation and their self-determined learning skills. The study also shows that there is no strong correlation between the backgrounds of the adult learners who participate the study and their self-determined learning skill scores. However, their

self-determined learning skill scores do increase as their professional experience increases. Based on this, it is evident that the impact of work experience on self-determined learning skills merits further investigation in future studies.

In conclusion, despite its limitations, this study has demonstrated that the self-determined learning skills scale is reliable and valid for the adult learners for this study. It has also helped to clarify the relationship between self-determined learning skills and the learning preferences of the participants.

# APPENDIX A

# ETHICS COMMITTEE APPROVAL

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ REKTÖRLÜĞÜ
Sosyal ve Beşeri Bilimler İnsan Araştırmaları Etik Kurulu (Sbinarek)

Sayı : E-84391427-050.01.04-172962 21.03.2024
Konu : 2024-02T Kayıt Numaralı Başvurunuz Hakkında

Sayın Doç. Dr. Bengü BÖRKAN AYDINER

Tez danışmanlığını yürüttüğünüz öğrenciniz Ayşegül Dilaver Yenier'in "Yetişkin Öğrenenlerin Öz-Belirlenimli Öğrenme Becerileri ve Öğrenme Tercihleri" başlıklı projesi ile Boğaziçi Üniversitesi Sosyal ve Beşeri Bilimler İnsan Araştırmaları Etik Kurulu (SBİNAREK)'e yaptığınız 2024-02T kayıt numaralı başvuru 14.03.2024 tarih ve 2024/02 sayılı kurul toplantısında incelenmiş ve projeye etik onay verilmesi uygun bulunmuştur.

Bu karar tüm üyelerin toplantıya on-line olarak katılımıyla ve oybirliği ile alınmıştır. Onay mektubu tüm üyeler adına Komisyon Başkanı tarafından e-imzalanmıştır. Bilgilerinizi rica ederiz.

Saygılarımızla,

Dr. Öğr. Üyesi Işıl ERDUYAN
Kurul Başkanı

Bu belge, güvenli elektronik imza ile imzalanmıştır.
Belge Doğrulama Kodu : 0157-6S7Z-08DK Belge Doğrulama Adresi : https://www.turkiye.gov.tr/bogazici-universitesi-ebys

34342 Bebek-İSTANBUL
Telefon No:
e-Posta:
Kep
Adresi: bogaziciuniversitesi@hs01.kep.tr
Fax No :
İnternet Adresi : www.bogazici.edu.tr
Bilgi İçin :Nurşen MUNAR
Mühendis
Telefon No:

APPENDIX B

PARTICIPANT INFORMED CONSENT FORM (ENGLISH)

T.C.

BOĞAZİÇİ ÜNİVERSİTESİ

SOCIAL AND HUMAN SCIENCES HUMAN RESEARCH ETHICS COMMITTEE

PARTICIPANT INFORMED CONSENT FORM

Research title: Self-Determined Learning Skills and Learning Preferences of Adult Learners

Name of the Project Manager/Researcher: Assoc. Prof. Dr. Bengü BÖRKAN / Ayşegül DİLAVER YENİER

E-mail address: XXXXXXXXXXXX@boun.edu.tr

Telephone: 0 XXX XXX XXX XX XX

Dear Participant

The aim of this study is to measure adult learners' heutagogical (self-determined learning) skills and to examine the relationship between these skills and their learning preferences (learning environment preferences, learning styles preferences, learning resources preferences, study techniques preferences, assessment methods preferences). In this context, participants will be administered the Self-Determined Learning Skills Scale and a questionnaire consisting of four questions to learn adult learners' learning preferences. These studies will be conducted online with the

approval of Boğaziçi University Social Sciences and Humanities Human Research Ethics Committee (SBİNAREK).

We invite you to participate in the survey to measure your self-determined learning skills as an adult learner and to understand your learning preferences. Within the scope of this study, we hope to understand the preferences of adult learners regarding their dispositions.

If you agree to participate in the study, we ask you to answer the questionnaire, which will take a maximum of 15 minutes, and provide the requested information. During the study, your personal data such as your name and e-mail will not be requested, and your answers will be kept completely anonymous. Your participation in the study is completely voluntary. Your responses to the survey may be used for other studies in the future. You can withdraw from the study at any time.

Before approving this form, please ask any questions you may have about the study. If you have any questions later, you can ask Assoc. Prof. Dr. Bengü BÖRKAN (Telephone: 0 XXX XXX XX XX). You can also consult Boğaziçi University Social and Human Sciences Human Research Ethics Committee (XXXXXXXX@boun.edu.tr) about your rights regarding the research. I understand what I have been told and what is written above, and I agree to participate in the study.

APPENDIX C

PARTICIPANT INFORMED CONSENT FORM (TURKISH)

T.C.

BOĞAZİÇİ ÜNİVERSİTESİ

SOSYAL VE BEŞERÎ BILIMLER İNSAN ARAŞTIRMALARI ETIK KURULU

KATILIMCI BİLGİ ve ONAM FORMU

Araştırmanın adı: Yetişkin Öğrenenlerin Öz-Belirlenimli Öğrenme Becerileri ve Öğrenme Tercihleri

Proje Yürütücüsü/Araştırmacının adı: Doç. Dr. Bengü BÖRKAN / Ayşegül DİLAVER YENİER

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

Telefonu: 0 XXX XXX XX XX

Sayın Katılımcı,

Bu çalışmanın amacı yetişkin öğrenenlerin hetagojik (öz-belirlenimli öğrenme) becerilerini ölçerek, bu becerilerinin öğrenim tercihleri (öğrenim ortamı tercihleri, öğrenim stilleri tercihleri, öğrenim kaynakları tercihleri, çalışma teknikleri tercihleri, değerlendirme yöntemleri tercihleri) ile ilişkisine bakmaktır. Bu bağlamda katılımcılara öz-belirlenimli öğrenim becerileri ölçeği ile yetişkin öğrenenlerin öğrenim tercihlerini öğrenmek için dört sorudan oluşan bir anket uygulanacaktır. Bu çalışmalar çevrim içi olarak Boğaziçi Üniversitesi Sosyal ve Beşerî Bilimler İnsan Araştırmaları Etik Kurulu (SBİNAREK) onayı ile yapılacaktır.

Sizi yetişkin öğrenen olarak öz-belirlenimli öğrenim becerilerinizi ölçmek ve öğrenim tercihlerinizi anlamak için yapacağımız ankete katılmaya davet ediyoruz. Bu çalışma kapsamında yetişkin öğrenenlerin eğilimleri ile ilgili tercihlerini anlamayı umuyoruz.

Araştırmaya katılmayı kabul ettiğiniz takdirde sizlerden, en fazla 15 dk sürecek anketi yanıtlamanızı ve istenen bilgileri sağlamınızı rica ediyoruz. Çalışma sırasında isminiz, e-postanız gibi kişisel verileriniz istenmeyecek ve vermiş olduğunuz cevaplar tamamen isimsiz olarak tutulacaktır. Çalışmaya katılmanız tamamen isteğe bağlıdır. Ankete verdiğiniz yanıtlar ileride başka çalışmalar için de kullanılabilir. İstediğiniz zaman çalışmaya katılmaktan vazgeçebilirsiniz.

Bu formu onaylamadan önce, çalışmayla ilgili sorularınız varsa lütfen sorun. Daha sonra sorunuz olursa, Doç. Dr. Bengü BÖRKAN (Telefon: 0 XXX XXX XX XX). sorabilirsiniz. Araştırmayla ilgili haklarınız konusunda Boğaziçi Üniversitesi Sosyal ve Beşerî Bilimler İnsan Araştırmaları Etik Kurulu'na (XXXXXXXX@boun.edu.tr) da danışabilirsiniz.

Bana anlatılanları ve yukarıda yazılanları anladım, çalışmaya katılmayı kabul ediyorum.

APPENDIX D

SELF-DETERMINED LEARNING SKILLS SCALE (ENGLISH)

Dear Participant,

Below are various statements about your learning processes. When answering the scale, you can generally think about all your learning processes and experiences throughout your working life, both compulsory and voluntary (professional development trainings). Answer the university, school, course, assignment descriptions in the scale by evaluating your professional trainings. Please read each statement by thinking about your professional learning processes and evaluate the extent to which each statement describes you on the 5-point scale below.

Please mark each item by choosing one of the following responses: never (1), rarely (2), sometimes (3), most of the time (4), always (5).

Thank you very much for your contribution to science.

The faculty you graduated from: _____

Occupation: _____

Years of experience working full-time: _____

Age: _____

Number of vocational trainings you attended in the last year: _____

Learning environment preference:

☐ Face to face

☐ Online

☐ Hybrid (face-to-face and online)

Self-determined Learning (Hetagogy) Skills Scale (Şahin Sarkın & Güvercin Seçkin, 2023)

| | Please indicate your level of agreement (x) with the statements below. | Never (1) | Rarely(2) | Sometimes (3) | Often (4) | Always(5) |
|---|---|---|---|---|---|---|
| 1)m1 | Before a new learning experience, I can identify what I do not know. | | | | | |
| 2)m2* | I expect my teachers to prioritize what I need to learn. | | | | | |
| 3)m3 | In the process of learning a new subject, I can identify what I need to solve a problem I encounter. | | | | | |
| 4)m4 | I can easily communicate with people who I think will contribute to my learning process. | | | | | |
| 5)m8 | I like to share my learning that I find special on social media. | | | | | |
| 6)m9* | I do not like it when my friends/teachers criticize my homework. | | | | | |
| 7)m10 | I do not have difficulty in accessing materials that facilitate my learning activities in virtual environments. | | | | | |
| 8)m11* | When learning a new subject, I do not need to question its connection with other subjects. | | | | | |
| 9)m12 | I enjoy learning by being a member of learning groups in social networks. | | | | | |
| 10)m13* | Even if I do not feel competent, if I am successful in a lesson, my learning of that lesson is over. | | | | | |
| 11)m17 | I can organize my new learning method with the experience I have gained from my previous learning. | | | | | |
| 12)m18 | I can easily accept difficulties in my learning experiences. | | | | | |
| 13)m19* | I am willing to learn when it is worth a grade (point). | | | | | |
| 14)m20 | I enjoy suggesting solutions to questions related to my field in virtual environments. | | | | | |
| 15)m21* | In my university courses, whatever the lecturer says is right for me. | | | | | |
| 16)m22 | I set learning goals for myself by making weekly plans. | | | | | |
| 17)m23* | My learning experiences are limited to school. | | | | | |
| 18)m24 | In my learning processes, I can identify my skills and competencies that are open to improvement. | | | | | |
| 19)m25 | I accept the experiences I gain in my learning processes as an investment in my future. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 20)m27 | I see learning as a need in daily life. | | | | | |
| 21)m29 | Determining my learning method makes me feel free. | | | | | |
| 22)m30 | I am enthusiastic when learning the subject, I am interested in. | | | | | |

## APPENDIX E

## SELF-DETERMINED LEARNING SKILLS SCALE (TURKISH)

Değerli Katılımcı,

Aşağıda öğrenme süreçlerinize ilişkin çeşitli ifadeler yer almaktadır. Ölçeği yanıtlarken genel olarak çalışma hayatınız boyunca zorunlu ve gönüllü (mesleki gelişim eğitimlerinizi) tüm öğrenme süreç ve deneyimlerinizi düşünebilirsiniz. Ölçekte belirtilen üniversite, okul, ders, ödev açıklamalarını mesleki eğitimlerinizi değerlendirerek cevaplayınız. Lütfen her bir ifadeyi mesleki öğrenme süreçlerinizi düşünerek okuyunuz ve her bir ifadenin sizi ne ölçüde tanımladığını aşağıdaki 5 aralıklı ölçek üzerinde değerlendiriniz.

Her bir maddeyi hiçbir zaman (1), nadiren (2), bazen (3), çoğu zaman (4), her zaman (5) yanıtlarından birini seçerek işaretleyiniz. Bilime sağladığınız katkıdan dolayı çok teşekkür ederiz.

Üniversiteden mezun olduğunuz fakülte: _____

Meslek: _____

Tam zamanlı çalışma deneyim yılınız: _____

Yaşınız: _____

Son bir yılında katıldığınız mesleki eğitim sayısı: _____

Öğrenme ortamı tercihiniz :

☐ Yüz yüze

☐ Çevrim içi

☐ Hibrit (Yüz yüze ve çevrim içi)

Öz-belirlenimli Öğrenme (Hetagoji) Becerileri Ölçeği (Şahin Sarkın & Güvercin Seçkin, 2023)

| | Aşağıda ifadelere katılma derecenizi (x) ile belirtiniz. | Hiçbir zaman(1) | Nadiren(2) | Bazen(3) | Çoğu zaman(4) | Her zaman(5) |
|---|---|---|---|---|---|---|
| 1)m1 | Yeni bir öğrenme deneyimi öncesi, neyi bilmediğimi tespit edebilirim. | | | | | |
| 2)m2* | Neyi öğrenmem gerektiğine dair öncelikleri hocalarımın belirlemesini beklerim. | | | | | |
| 3)m3 | Yeni bir konuyu öğrenme sürecinde, karşılaştığım bir problemi çözmek için neye ihtiyacım olduğunu belirleyebilirim. | | | | | |
| 4)m4 | Öğrenme sürecime katkıda bulunacağını düşündüğüm kişilerle rahatlıkla iletişime geçerim. | | | | | |
| 5)m8 | Kendimce özel bulduğum öğrenmelerimi sosyal medyada paylaşmaktan hoşlanırım. | | | | | |
| 6)m9* | Hazırladığım ödevi arkadaşlarımın/hocalarımın eleştirmelerinden hoşlanmam. | | | | | |
| 7)m10 | Sanal ortamlarda öğrenme etkinliklerimi kolaylaştıran materyallere ulaşmakta zorlanmam. | | | | | |
| 8)m11* | Yeni bir konuyu öğrenirken bunun diğer konularla bağlantısını sorgulamaya gerek duymam. | | | | | |
| 9)m12 | Sosyal ağlarda öğrenme gruplarına üye olarak öğrenmeler gerçekleştirmekten zevk alırım. | | | | | |
| 10)m13* | Kendimi yeterli hissetmesem de, bir derste başarılı olduysam o derse dair öğrenmelerim sona erer. | | | | | |
| 11)m17 | Önceki öğrenmelerimden edindiğim tecrübe ile yeni öğrenme yöntemimi düzenleyebilirim. | | | | | |
| 12)m18 | Öğrenme deneyimlerimde zorlandığım durumları rahatlıkla kabul ederim. | | | | | |
| 13)m19* | Not (puan) karşılığı olduğunda öğrenmeye istekli olurum. | | | | | |
| 14)m20 | Sanal ortamlarda alanımla ilgili sorulara çözüm önerileri getirmekten zevk alırım. | | | | | |
| 15)m21* | Üniversitedeki derslerimde dersin hocası ne söylüyorsa benim için doğru odur. | | | | | |
| 16)m22 | Haftalık planlar yaparak kendime öğrenme hedefleri belirlerim. | | | | | |
| 17)m23* | Öğrenme deneyimlerim okul ile sınırlıdır. | | | | | |
| 18)m24 | Öğrenme süreçlerimde, geliştirmeye açık beceri ve yetkinliklerimi belirleyebilirim. | | | | | |
| 19)m25 | Öğrenme süreçlerimde edindiğim deneyimleri, geleceğime yatırım olarak kabul ederim. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 20)m27 | Öğrenmeyi günlük yaşamda bir ihtiyaç olarak görürüm. | | | | | |
| 21)m29 | Öğrenme yöntemimi belirlemem, kendimi özgür hissetmemi sağlar. | | | | | |
| 22)m30 | İlgi duyduğum konuyu öğrenirken hevesli olurum. | | | | | |

APPENDIX F

LEARNING PREFERENCES SURVEY (ENGLISH)

Learning styles

In a new learning process (online or face-to-face), please indicate how often you prefer the following types of learning for efficient learning.

Mark each item by choosing one of the following responses: never (1), rarely (2), sometimes (3), often (4), always (5).

| | Never (1) | Rarely(2) | Sometimes (3) | Often (4) | Always(5) |
|---|---|---|---|---|---|
| Lecture (listening & watching) | | | | | |
| Class discussion | | | | | |
| Group work | | | | | |
| Individual work | | | | | |
| Projects | | | | | |
| Other | | | | | |

Learning resources

In a new learning process, indicate how often you prefer the following learning resources for more efficient learning.

| | Never (1) | Rarely(2) | Sometimes (3) | Often (4) | Always(5) |
|---|---|---|---|---|---|
| Site, blog, etc. reached from search engines | | | | | |
| Readings (books, articles, etc.) | | | | | |
| Videos | | | | | |
| Listening tools like podcasts | | | | | |
| Experts | | | | | |
| Social media | | | | | |
| Other | | | | | |

Study techniques

Please indicate how often you prefer the following study techniques for more efficient learning during a new learning experience.

| | Never (1) | Rarely(2) | Sometimes (3) | Often (4) | Always(5) |
|---|---|---|---|---|---|
| Working by solving questions | | | | | |
| Self-telling | | | | | |
| Working with concepts | | | | | |
| Re-reading | | | | | |
| Visualization | | | | | |
| Underlining work | | | | | |
| Working with the trainer | | | | | |
| Summarization | | | | | |
| Listening/Watching | | | | | |
| Peer and group discussion | | | | | |
| Other | | | | | |

Critical reflection

To what extent do you use which of the following techniques to manage/enhance learning during and after a new learning experience?

| | Never (1) | Rarely(2) | Sometimes (3) | Often (4) | Always(5) |
|---|---|---|---|---|---|
| I keep regular records (diary, etc.) to track my learning. | | | | | |
| I organize what I have learned in my own way, using methods such as summarizing and listing. | | | | | |
| During the learning process, I set goal(s) for myself and check whether I have reached the goal(s). | | | | | |
| I focus on the concepts I have learned and progress through the concepts. | | | | | |
| I reassemble what I have learned by converting it into different visual formats (such as video, drawing). | | | | | |
| During the learning process, I receive feedback and support from experts such as instructors. | | | | | |
| I get feedback and support from my circle of friends during the learning process. | | | | | |
| Other | | | | | |

APPENDIX G

LEARNING PREFERENCES SURVEY (TURKISH)

Aşağıda öğrenim tercihlerinize ilişkin çeşitli ifadeler yer almaktadır. Her bir maddeyi hiçbir zaman (1), nadiren (2), bazen (3), çoğu zaman (4), her zaman (5) yanıtlarından birini seçerek işaretleyiniz.

Öğrenim türleri

Yeni bir öğrenim sürecinde (çevrim içi veya yüz yüze) aşağıdaki öğrenim türlerini verimli öğrenme için hangi sıklıkta tercih ettiğinizi belirtiniz.

| | hiçbir zaman (1) | nadiren (2) | bazen (3) | çoğu zaman (4) | her zaman (5) |
|---|---|---|---|---|---|
| Düz anlatım (dinleme & izleme) | | | | | |
| Sınıf içerisinde tartışma | | | | | |
| Grup çalışmaları | | | | | |
| Bireysel çalışma | | | | | |
| Proje temelli | | | | | |
| Diğer (Belirtiniz) | | | | | |

Öğrenim kaynakları

Yeni bir öğrenim sürecinde aşağıdaki öğrenim kaynaklarını daha verimli öğrenme için hangi sıklıkta tercih ettiğinizi belirtiniz.

| | hiçbir zaman (1) | nadiren (2) | bazen (3) | çoğu zaman (4) | her zaman (5) |
|---|---|---|---|---|---|
| Arama motorları sonucu ulaşılan site, blog vs | | | | | |
| Okumalar (kitap, makale vs) | | | | | |
| Videolar | | | | | |
| Podcast gibi dinleme araçları | | | | | |
| Uzman kişiler | | | | | |
| Sosyal medya | | | | | |
| Diğer (Belirtiniz) | | | | | |

Çalışma teknikleri

Yeni bir öğrenme deneyimi sürecinde aşağıdaki çalışma tekniklerini daha verimli öğrenme için hangi sıklıkta tercih ettiğinizi belirtiniz.

| | hiçbir zaman (1) | nadiren (2) | bazen (3) | çoğu zaman (4) | her zaman (5) |
|---|---|---|---|---|---|
| Soru çözerek çalışma | | | | | |
| Kendi kendine anlatma | | | | | |
| Kavramlara çalışma | | | | | |
| Tekrar okuma | | | | | |
| Görselleştirme | | | | | |
| Altını çizerek çalışma | | | | | |
| Eğitmen ile çalışma | | | | | |
| Özetleme | | | | | |
| Dinleme/İzleme | | | | | |
| Akran ve grup tartışması | | | | | |
| Diğer (Belirtiniz) | | | | | |

Yansıma etkinlikleri

Öğrenme deneyimi sürecinde ve sonrasında öğrenip öğrenmediğinizi kontrol etmek ve daha iyi düzeyde geliştirmek için aşağıdaki tekniklerden hangilerini ne derecede kullanırsınız?

| | hiçbir zaman (1) | nadiren (2) | bazen (3) | çoğu zaman (4) | her zaman (5) |
|---|---|---|---|---|---|
| Öğrenimimi takip etmek için düzenli kayıt tutarım (günlük vb.). | | | | | |
| Öğrendiklerimi özet çıkarma ve listeleme gibi yöntemlerle kendime göre organize ederim. | | | | | |
| Öğrenme sürecinde kendime hedef/ler koyar, hedefe/lere ulaşıp ulaşmadığımı kontrol ederim. | | | | | |
| Öğrendiğim kavramlara odaklanır ve kavramlar üzerinden ilerlerim. | | | | | |
| Öğrendiklerimi görsel (video, çizim gibi) farklı formatlara dönüştürerek yeniden bir araya getiririm. | | | | | |
| Öğrenim sürecinde eğitmen gibi uzman kişilerden geri bildirim ve destek alırım. | | | | | |
| Öğrenim sürecinde arkadaş çevremden geri bildirim ve destek alırım. | | | | | |
| Diğer (Belirtiniz) | | | | | |

# REFERENCES


Agonács, N., & Matos, J. F. (2019). Heutagogy and self-determined learning: A review of the published literature on the application and implementation of the theory. *Open Learning the Journal of Open Distance and e-Learning*, *34*(3), 223–240. https://doi.org/10.1080/02680513.2018.1562329

Argyris, C. (1976). Single-loop and double-loop models in research on decision making. *Administrative Science Quarterly*, *21*(3), 363. https://doi.org/10.2307/2391848

Argyris, C. (2002). Double-loop learning, teaching, and research on JSTOR. (n.d.). *www.jstor.org*. Retrieved from http://www.jstor.org/stable/40214154

Ashton, J., & Newman, L. (2006). An unfinished symphony: 21st century teacher education using knowledge creating heutagogies. *British Journal of Educational Technology*, *37*(6), 825–840. https://doi.org/10.1111/j.1467-8535.2006.00662.x

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295x.84.2.191

Bartoszewski, B. L., & Gurung, R. a. R. (2015). Comparing the relationship of learning techniques and exam score. *Scholarship of Teaching and Learning in Psychology*, *1*(3), 219–228. https://doi.org/10.1037/stl0000036

Bates, A. (2015). *Teaching in a Digital Age: Guidelines for Designing Teaching and Learning*. Retrieved from https://openlibrary-repo.ecampusontario.ca/jspui/bitstream/123456789/276/14/Teaching-in-a-Digital-Age-1429535678-Vi-15092015.odt

Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry*, *7*(1), 1–15. https://doi.org/10.1207/s15327965pli0701_1

Becker, G. S. (1994). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. University of Chicago Press.

Blackman, D., Connelly, J., & Henderson, S. (2004). Does double loop learning create reliable knowledge? *The Learning Organization*, *11*(1), 11–27. https://doi.org/10.1108/09696470410515706

Blair, K., & Hoy, C. (2006). Paying attention to adult learners online: The pedagogy and politics of community. *Computers & Composition/Computers and Composition*, *23*(1), 32–48. https://doi.org/10.1016/j.compcom.2005.12.006

Blaschke, L. M. (2017). Self-determined learning (heutagogy) and digital media creating integrated educational environments for developing lifelong learning skills. In *Springer eBooks* (pp. 129–140). https://doi.org/10.1007/978-3-658-19925-8_10

Blaschke, L. M. (2019). The pedagogy–andragogy–heutagogy continuum and technology-supported personal learning environments. In *Springer briefs in education* (pp. 75–84). https://doi.org/10.1007/978-981-13-7740-2_9

Blaschke, L. M. (2012). View of heutagogy and lifelong learning: A review of heutagogical practice and self-determined learning. (n.d.-b). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1076/2113

Blaschke, L. M., & Hase, S. (2021). So, you want to do heutagogy: Principles and practice. *EdTech Books*. Retrieved from https://edtechbooks.org/up/pp/pdf_router/print

Blaschke, L. M., Kenyon, C., & Hase, S. (2014). *Experiences in Self-Determined Learning*. Createspace Independent Publishing Platform.

Blaschke, L. M. (2016). Self-determined learning: Designing for heutagogic learning environments. In *Springer eBooks* (pp. 1–22). https://doi.org/10.1007/978-3-319-17727-4_62-1

Brookfield, S. D. (1987). *Developing Critical Thinkers: Challenging Adults to Explore Alternative Ways of Thinking and Acting*.

Büyüköztürk, Ş., Çakmak, E. K., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2017). Bilimsel araştırma yöntemleri. *Pegem Atıf İndeksi*, 1–360. https://doi.org/10.14527/2240

Caffarella, R. S., & Barnett, B. G. (1994). Characteristics of adult learners and foundations of experiential learning. *New Directions for Adult and Continuing Education*, *1994*(62), 29–42. https://doi.org/10.1002/ace.36719946205

Cairns, L. (2000, May). The process/outcome approach to becoming a capable organisation. In *Australian Capability Network Conference* (pp. 1-14). Sydney.

Canning, N., & Callan, S. (2010). Heutagogy: Spirals of reflection to empower learners in higher education. *Reflective Practice*, *11*(1), 71–82. https://doi.org/10.1080/14623940903500069

Canţer, M. (2012). E-heutagogy for lifelong e-learning. *Procedia Technology*, *1*, 129–131. https://doi.org/10.1016/j.protcy.2012.02.025

Cheng, S., Kuo, C., Lin, K., & Lee-Hsieh, J. (2010). Development and preliminary testing of a self-rating instrument to measure self-directed learning ability of nursing students. *International Journal of Nursing Studies*, *47*(9), 1152–1158. https://doi.org/10.1016/j.ijnurstu.2010.02.002

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297–334. https://doi.org/10.1007/bf02310555

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. *Springer eBooks*. https://doi.org/10.1007/978-1-4899-2271-7

DeVellis, R. F. (1991). *Scale Development: Theory and Applications*. Retrieved from https://ci.nii.ac.jp/ncid/BB06453461

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques. *Psychological Science in the Public Interest*, *14*(1), 4–58. https://doi.org/10.1177/1529100612453266

Field, A. (2017). *Discovering Statistics Using Ibm Spss Statistics*. Retrieved from https://dl.acm.org/citation.cfm?id=2502692

Friedman, Z. L., & Nash-Luckenbach, D. (2023). Has the time come for heutagogy? Supporting neurodivergent learners in higher education. *Higher Education*, *87*(6), 1905–1920. https://doi.org/10.1007/s10734-023-01097-7

The Future of Jobs Report 2023. (2024, September 10). Retrieved from https://www.weforum.org/publications/the-future-of-jobs-report-2023/

Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly*, *48*(1), 18–33. https://doi.org/10.1177/074171369704800103

Green, J., & Huntington, A. (2017). Online professional development for digitally differentiated nurses: An action research perspective. *Nurse Education in Practice*, *22*, 55–62. https://doi.org/10.1016/j.nepr.2016.11.009

Greenwood, J. (1998). The role of reflection in single and double loop learning. *Journal of Advanced Nursing*, *27*(5), 1048–1053. https://doi.org/10.1046/j.1365-2648.1998.00579.x

Mortimore, P. (1999). *Understanding Pedagogy: And Its Impact on Learning*. SAGE.

Hair, J. F. (2010). Multivariate data analysis : A global perspective. *Pearson eBooks*. Retrieved from https://ci.nii.ac.jp/ncid/BB03463866

Hase, S., & Davis, L. (1999). From competence to capability: The implications for human resource development and management. *Education, Cybertechnology, and Leadership: Association of International Management*. Retrieved from https://www.researchgate.net/profile/Stewart_Hase/publication/37358999_From_competence_to_capability_the_implications_for_human_resource_development_and_management/links/54adf65f0cf2213c5fe41d3b.pdf

Hase, S. (2009). Heutagogy and e-learning in the workplace: Some challenges and opportunities. *Journal of Applied Research in Workplace E-learning*, *1*(1), 43–52. Retrieved from http://epubs.scu.edu.au/bus_pubs/72/

March 31, 2013 – Heutagogy community of practice. (2013, March 31). Retrieved from https://heutagogycop.wordpress.com/2013/03/31/

Copheutagogy. (2014, October 8). Thinking about thinking: Reflection and metacognition. Retrieved from https://heutagogycop.wordpress.com/2014/10/07/thinking-about-thinking-reflection-and-metacognition/

Hase, S., & Kenyon, C. (2013b). *Self-Determined Learning: Heutagogy in Action*. A&C Black.

Hase, S., & Kenyon, C. (2007). Heutagogy: A child of complexity theory. *Complicity an International Journal of Complexity and Education*, *4*(1). https://doi.org/10.29173/cmplct8766

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, *30*(2), 179–185. https://doi.org/10.1007/bf02289447

Hutcheson, G. (1999). *The Multivariate Social Scientist*. https://doi.org/10.4135/9780857028075

Jailani, A. (2020). How educational practices influence students' motivation in learning foreign languages. *Jurnal Keagamaan Dan Pendidikan, 16*(1), 95–104.

Jarvis, P. (2001). *Twentieth Century Thinkers in Adult and Continuing Education*. https://doi.org/10.4324/9780203819708

Jones, C., Penaluna, K., & Penaluna, A. (2019). The promise of andragogy, heutagogy and academagogy to enterprise and entrepreneurship education pedagogy. *Education + Training*, *61*(9), 1170–1186. https://doi.org/10.1108/et-10-2018-0211

Jover, G., Martín, R. G., & Fuentes, J. L. (2018). Constructing creative democracy at school by reading the classics: A dialogue between Martha Nussbaum and John Dewey. In *Emerald Publishing Limited eBooks* (pp. 61–79). https://doi.org/10.1108/978-1-78743-625-120181010

Kaiser, H. F., & Rice, J. (1974). Little Jiffy, Mark Iv. *Educational and Psychological Measurement*, *34*(1), 111–117. https://doi.org/10.1177/001316447403400115

Kenyon, Chris, & Hase, S. (2001, March). Moving from andragogy to heutagogy in vocational education (Opinion Papers (120) speeches/meeting papers (150)). *Research to Reality: Putting VET Research to Work. Proceedings of the Australian Vocational Education and Training Research Association (AVETRA) Conference*. Retrieved from https://files.eric.ed.gov/fulltext/ED456279.pdf

Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling, Fourth Edition*. Guilford Publications.

Knowles, M. S. (1973). *The Adult Learner: A Neglected Species*. Houston [Tex.] : Gulf Publishing Company.

Knowles, M. S. (1988). *The Modern Practice of Adult Education: Andragogy Versus Pedagogy*.

Knowles, M. S., Holton, E. F., III, & Swanson, R. A. (2005). *The Adult Learner*. Routledge.

Kolb, D. A. (1985). *Learning-style Inventory: Self-scoring Inventory and Interpretation Booklet*.

Lee, D., McCool, J., & Napieralski, L. (2000). Assessing adult learning preferences using the analytic hierarchy process. *International Journal of Lifelong Education*, *19*(6), 548–560. https://doi.org/10.1080/02601370050209078

Lemmetty, S., & Collin, K. (2019). Self-directed learning as a practice of workplace learning: Interpretative repertoires of self-directed learning in ICT work. *Vocations and Learning*, *13*(1), 47–70. https://doi.org/10.1007/s12186-019-09228-x

Leutner, D., Leopold, C., & Sumfleth, E. (2009). Cognitive load and science text comprehension: Effects of drawing and mentally imagining text content. *Computers in Human Behavior*, *25*(2), 284–289. https://doi.org/10.1016/j.chb.2008.12.010

Matsunaga, M. (2010). How to factor-analyze your data right: Do's, don'ts, and how-to's. *International Journal of Psychological Research*, *3*(1), 97–110. https://doi.org/10.21500/20112084.854

Mayer, R. E. (2014). Introduction to multimedia learning. In *Cambridge University Press eBooks* (pp. 1–24). https://doi.org/10.1017/cbo9781139547369.002

McKenzie, L. (1977). The issue of andragogy. *Adult Education*, *27*(4), 225–229. https://doi.org/10.1177/074171367702700403

Mezirow, J. (1994). Understanding transformation theory. *Adult Education Quarterly*, *44*(4), 222–232. https://doi.org/10.1177/074171369404400403

Mezirow, J. (1990). *Fostering Critical Reflection in Adulthood: A Guide to Transformative and Emancipatory Learning*. Jossey-Bass.

Miller, D., & Anthony, A. B. (2021). Professional learning plan: A tool to facilitate teacher collaboration and improve instructional practice. *Journal of Cases in Educational Leadership*, *24*(4), 84–102. https://doi.org/10.1177/15554589211021139

Moliterni, P., De Stasio, S., Carboni, M., & Di Chiacchio, C. (2010). *Motivational and Self Regulated Learning Components of Academic Performance*.

Moore, R. L. (2020). Developing lifelong learning with heutagogy: Contexts, critiques, and challenges. *Distance Education*, *41*(3), 381–401. https://doi.org/10.1080/01587919.2020.1766949

Muller, K., & Cohen, J. (1989). Statistical power analysis for the behavioral sciences. *Technometrics*, *31*(4), 499. https://doi.org/10.2307/1270020

Nadi, M. A., & Sajjadian, I. (2012). Investigating validity and reliability of Guglielmino´s self-directed learning readiness scale (SDLRS) among medical and dentistry students. *Iranian Journal of Medical Education*, *12*(6), 467–479. Retrieved from http://ijme.mui.ac.ir/article-1-1889-en.pdf

Ozturk, N. (2017). Assessing metacognition: Theory and practices. *International Journal of Assessment Tools in Education*, 134. https://doi.org/10.21449/ijate.298299

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles. *Psychological Science in the Public Interest*, *9*(3), 105–119. https://doi.org/10.1111/j.1539-6053.2009.01038.x

Phelps, R., Hase, S., & Ellis, A. (2004). Competency, capability, complexity and computers: Exploring a new model for conceptualising end- user computer education. *British Journal of Educational Technology*, *36*(1), 67–84. https://doi.org/10.1111/j.1467-8535.2005.00439.x

Pituch, K. A., & Stevens, J. P. (2015). *Applied Multivariate Statistics for the Social Sciences: Analyses with SAS and IBM's SPSS, Sixth Edition*. Routledge.

Pışkın, M., Atık, G., Çınkır, Ş., Öğülmüş, S., Babadoğan, C., & Çokluk, Ö. (2014). The development and validation of the teacher violence scale. *Eurasian Journal of Educational Research*, *14*(56). https://doi.org/10.14689/ejer.2014.56.3

Rahayu, N. W., Ferdiana, R., & Kusumawardani, S. S. (2021). Model of nonlinear learning path using heutagogy. *Technology & Education (TALE)*. https://doi.org/10.1109/tale52509.2021.9678642

Reischmann, J. (2004). *Andragogy*. Retrieved from http://andragogy.net/Andragogy-Internet.pdf

Sarkin, D. B. Ş., & SeçkiN, G. G. (2023). Öz-belirlenimli öğrenme (hetagoji) becerileri ölçeğinin geliştirilmesi: geçerlik ve güvenirlik çalışması. *Cukurova University Faculty of Education Journal*, *52*(2), 381–411. https://doi.org/10.14812/cuefd.1197043

Şahin, D. B., & Gülleroğlu, H. D. (2013). Likert tipi ölçeklere madde seçmede kullanılan farklı madde analizi teknikleri ile oluşturulan ölçeklerin psikometrik özelliklerinin incelenmesi. *DergiPark (Istanbul University)*. Retrieved from https://dergipark.org.tr/tr/pub/aji/issue/1536/18817

Marcucci, M., & Sharma, S. (1997). Applied multivariate techniques. *Technometrics*, *39*(1), 101. https://doi.org/10.2307/1270777

Skinner, B. F. (1958). Teaching machines. *Science*, *128*(3330), 969–977. https://doi.org/10.1126/science.128.3330.969

Smith, E. (2011). Teaching critical reflection. *Teaching in Higher Education*, *16*(2), 211–223. https://doi.org/10.1080/13562517.2010.515022

Stoszkowski, J., & Collins, D. (2017). Nirvana or never-never Land: Does heutagogy have a place in coach development? *International Sport Coaching Journal*, *4*(3), 353–358. https://doi.org/10.1123/iscj.2017-0001

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2018). *Using Multivariate Statistics*.

Tagg, J. (2010). The learning- paradigm campus: From single- to double- loop learning. *New Directions for Teaching and Learning*, *2010*(123), 51–61. https://doi.org/10.1002/tl.409

Tavşancıl, E., & Önen, E., (2008). Durumsal üst biliş envanterinin türk lise öğrencileri için uyarlanması. I. Uluslararası Türkiye Eğitim Araştırmaları Kongresi, Çanakkale, Türkiye

Tiew, C. C., & Abdullah, M. N. L. Y. (2021). Heutagogy approach in 21st century teaching and learning: Practices and challenges in malaysian higher education. *Deleted Journal*, *13*(1). https://doi.org/10.17576/ajtlhe.1301.2021.02

Torabi, N., Abdollahi, B., Aslani, G., & Bahrami, A. (2013). A validation of a self-directed learning readiness scale among preliminary school teachers in esfahan. *Procedia - Social and Behavioral Sciences*, *83*, 995–999. https://doi.org/10.1016/j.sbspro.2013.06.185

Vaughan, K. (2015). Workplace learning: A literature review. *Nzcer*. Retrieved from https://www.academia.edu/2057544/Workplace_learning_A_literature_review?auto=download

Vygotsky, L. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Retrieved from https://ci.nii.ac.jp/ncid/BA03570814

Watkins, C., & Mortimore, P. (1999). Pedagogy: What do we know? In *SAGE Publications Ltd eBooks* (pp. 1–19). https://doi.org/10.4135/9781446219454.n1

Whiting, F., & Martin, M. (2020). *Human Resource Practice*. Kogan Page Publishers.

Wismaningrum, Y. D. R., Prayitno, H. J., & Supriyanto, E. (2020). Heutagogy approach: The implementation of new normal era learning. *Advances in Social Science, Education and Humanities Research/Advances in Social Science, Education and Humanities Research*. https://doi.org/10.2991/assehr.k.201015.029

Youde, A. (2018). Andragogy in blended learning contexts: Effective tutoring of adult learners studying part-time, vocationally relevant degrees at a distance. *International Journal of Lifelong Education*, *37*(2), 255–272. https://doi.org/10.1080/02601370.2018.1450303