



People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
Echahid Cheikh Larbi Tebessi University-Tebessa
Faculty of Letters and Languages
Department of Letters and English Language



The Contribution of self-directed Learning to Promote Critical Thinking

The Case of M2 students of English at Echahid Cheikh Larbi Tebessi
University-Tebessa

A Dissertation Submitted to the Department of Letters and English Language in Partial
Fulfilment of the Requirements for the Degree of Master in Language Sciences

Candidates:

Hamada TAROUM

Supervisor:

Dr. Karima TAYAA

Board of Examiners:

President: Dr. Nawal KHELALFA (M.C.B, Larbi Tebessi University -Tebessa)

Supervisor: Dr. Karima TAYAA (M.C.B, Larbi Tebessi University -Tebessa)

Examiner: Dr. Massaouda BOUCHOUCHA (M.A.A, Larbi Tebessi University -
Tebessa)

2022/2023

Abstract

In today's complex and ever-changing world, the development of critical thinking skills is of utmost importance. Educational systems have recognized the significance of self-directed learning (SDL) in fostering these skills among students. This study aims to explore the promotion of critical thinking (CT) abilities through SDL methods. The research design employed a descriptive approach to examine strategies that enhance SDL and CT, while the regression analysis sought to understand the impact of SDL strategies on CT and establish a quantitative understanding of the relationship between the two variables. Additionally, this study aims to identify the most and least utilized strategies by M2 LS students in the English department of Echahid Cheikh Larbi Tebessi University for developing SDL and CT. A quantitative approach was employed, and the data was analysed using quantitative methods to address the research questions and hypotheses. The questionnaire was the sole research tool utilized, administered to a sample of 38 M2 LS students from the English department to further investigate overall and frequently employed strategies for improving SDL and CT. The study findings revealed that M2 LS students are already employing specific strategies to enhance SDL and CT. Furthermore, the results indicated that SDL significantly contributes to the promotion of CT. Therefore, teachers play a crucial role in creating a supportive and empowering learning environment that nurtures students' SDL and CT skills, equipping them for success in their academic endeavours and beyond.

Keywords: Critical thinking, Self-directed learning, skills, Strategies

Acknowledgments

In the name of Allah, the Most Gracious, Most Merciful, all praises are given to Him for providing me with the strength and the ability to finish this dissertation. Special thanks to my supervisor **Dr. Karima TAYAA** for her hard work, patience and the massive efforts she made to provide a proper guidance for me, and I am more than grateful to work under her supervision. I am also thankful to **Dr. Aissa HAMZAOU**, **Dr. Nawal KHELALFA** and **Ms. Asma DOUAIBIA** for their contribution.

Also, I want to express my gratitude to the jury members for taking the time and making the effort to discuss my work.

In addition to that, special thanks to those who volunteered from Master's second year language science at the Department of English language of Echahid Cheikh Larbi Tebessi University, for their collaboration that helped me in gathering data.

Finally, I am not only making this work for academic credit, but also to learn more. Once again, I want to thank everyone who assisted me with this dissertation.

Dedication

I dedicate my study to:

First and most importantly I want to dedicate my work for my precious Mom who always

believed in me even when I didn't believe in myself

For my father who helped me reach this stage in life

For my brothers who helped shape myself into a better person

My classmates who always showed support to me I wish all the best to all of them

Whoever supported me throughout all these years

For the one I love and kept the smile on my face

Table of Contents

Abstract	I
Acknowledgments.....	II
Dedication.....	III
Table of Contents	IV
List of Tables	IX
List of Figures.....	XI
List of Appendices	XII
List of Abbreviations.....	XIII
General introduction	1
1. Background of the Study.....	1
2. Statement of the Problem.....	3
3. Research Questions.....	3
4. Research Assumptions	3
5. Aims of the Study	4
6. Significance of the Study.....	4
7. Methodology	5
8. Structure of the Dissertation.....	5
Chapter One: Literature Review	7
Introduction.....	7

THE CONTRIBUTION OF SDL TO CT	V
1.1. Definition of Self-Directed Learning.....	7
1.2. Importance of SDL in Education.....	8
1.3. Key Principles of SDL.....	10
1.3.1. Autonomy.....	10
1.3.2. Self-Regulation.....	11
1.3.3. Motivation.....	12
1.3.4. Initiative.....	13
1.3.5. Reflection.....	14
1.3.6. Flexibility.....	15
1.3.7. Collaboration.....	15
1.4. Theories and Models of Self-Directed Learning.....	16
1.4.1. Andragogy Theory (Malcolm Knowles).....	17
1.4.2. Self- Determination Theory (Edward Deci and Richrad Rayan).....	18
1.4.3. Social Cognitive Theory (Albert Bandura).....	19
1.4.4. Experiential Learning Theory (David Kolb).....	21
1.4.5. Transformative Learning Theory (Jack Mezirow).....	22
1.4.6. Self- Regulated Learning Theory (David Zimmerman).....	23
1.5. Characteristics and skills of Self-Directed Learners.....	25
1.5.1. Self-awareness and Metacognition.....	26
1.5.2. Goals Setting and Planning.....	27
1.5.3. Time Management and Organization.....	28

THE CONTRIBUTION OF SDL TO CT	VI
1.5.4. Information Seeking and Resource Utilization.....	29
1.5.5. Critical Thinking and Problem Solving.....	30
1.5.6. Reflection and Self-evaluation.....	31
2. Definition and significance e of Critical Thinking.....	32
2.1. Role of critical thinking in problem-solving in EFL context.....	34
2.2. Key Components of Critical Thinking	34
2.2.1. Analysis.....	35
2.2.2. Evaluation	35
2.2.3. Inference	36
2.2.4. Interpretation.....	36
2.2.5. Reflection.....	37
2.3. Characteristics of Critical Thinkers	38
2.3.1. Open-Mindedness and Intellectual Curiosity.....	38
2.3.2. Objectivity and fairness	39
2.3.3. Analytical and Logical reasoning.....	40
2.3.4. Scepticism and Questioning.....	40
2.3.5. Creative and Independent Thinking	41
2.4. Self-Directed Learning and Critical Thinking: A Synergistic Relationship.....	41
2.4.1. Previous Studies on the Impact of Self-Directed Learning on Critical Thinking..	42
Conclusion	44

Chapter Two: Research Methodology, Data Analysis, and Discussion Erreur ! Signet non défini.

Introduction	Erreur ! Signet non défini.
2.1 Section One: Research Methodology	Erreur ! Signet non défini.
2.1.1 Research Design and Method	Erreur ! Signet non défini.
2.1.2 <i>Population and sampling</i>	Erreur ! Signet non défini.
2.1.3. Research Instruments	Erreur ! Signet non défini.
2.1.3.1. Validity of the Questionnaire	Erreur ! Signet non défini.
2.1.3.2. Reliability of the Questionnaire	Erreur ! Signet non défini.
2.1.4. Data Collection/Analysis Procedures	Erreur ! Signet non défini.
2.2. Section Two: Data Analysis	Erreur ! Signet non défini.
Section Two: Self-Directed Learning	Erreur ! Signet non défini.
Section Three: Critical Thinking	Erreur ! Signet non défini.
2.3. Section Three: Discussion of the Results	Erreur ! Signet non défini.
2.3.1. Discussion of the Questionnaire Results	Erreur ! Signet non défini.
2.3.2. Results of Regression Study	Erreur ! Signet non défini.
2.3.3. Summary of the Results	Erreur ! Signet non défini.
2.3.4. Limitations of the study	Erreur ! Signet non défini.
2.3.5. Recommendations of the study	Erreur ! Signet non défini.
Conclusion	Erreur ! Signet non défini.
General Conclusion	83

References..... 85

Appendices 93

List of Tables

Table 1: *Number and percentage of participants compared to the sample* **Erreur ! Signet non défini.**

Table 2: *Age ranges of students* **Erreur ! Signet non défini.**

Table 3: *Participants' gender*..... **Erreur ! Signet non défini.**

Table 4: *The respondents' investing time in preparations* **Erreur ! Signet non défini.**

Table 5: *The students search for a range of materials* **Erreur ! Signet non défini.**

Table 6: *Students follow teachers' explanations* **Erreur ! Signet non défini.**

Table 7: *Students desire to learn*..... **Erreur ! Signet non défini.**

Table 8: *Students and self-reliant learning style*..... **Erreur ! Signet non défini.**

Table 9: *Participants reflecting on and analysing the information received during the session*
..... **Erreur ! Signet non défini.**

Table 10: *Students seeking feedback from teachers* **Erreur ! Signet non défini.**

Table 11: *Students take notes regularly*..... **Erreur ! Signet non défini.**

Table 12: *Students search for topics they are interested in* **Erreur ! Signet non défini.**

Table 13: *Students set their standards to rate their performances* . **Erreur ! Signet non défini.**

Table 14: *Students are aware of their limitations* **Erreur ! Signet non défini.**

Table 15: *Students examine their abilities*..... **Erreur ! Signet non défini.**

Table 16: *Participants set plans in advance to solve learning problems*... **Erreur ! Signet non défini.**

Table 17: *Students set their deadlines* **Erreur ! Signet non défini.**

Table 18: *Learners consider their mistakes as lessons* **Erreur ! Signet non défini.**

Table 19: *Students trying to work on their problem-solving skills and evaluate them* . **Erreur !**

Signet non défini.

Table 20: *Students prepare evidence before engaging in any topic* **Erreur ! Signet non défini.**

Table 21: *Students are trying to make quick and accurate decisions* **Erreur ! Signet non défini.**

Table 22: *The students express their opinions in an understandable way* . **Erreur ! Signet non défini.**

Table 23: *Students take the other perspectives into account before they make a judgment*
..... **Erreur ! Signet non défini.**

Table 24: *Learners with the ability to draw conclusions and make informed judgments*
..... **Erreur ! Signet non défini.**

Table 25: *Students with the ability to identify the gap between logic and a given opinion*
..... **Erreur ! Signet non défini.**

Table 26: *Students who trust their thoughts when they come across a new idea* **Erreur !**
Signet non défini.

Table 27: *Students who are capable of evaluating their conclusions concerning an issue they are facing*..... **Erreur ! Signet non défini.**

Table 28: *Students with the ability to explain and characterize learning problems* **Erreur !**
Signet non défini.

List of Figures

Figure 1 <i>Five Assumptions of Adult Learners</i>	17
Figure 2 <i>Self-Determination Theory</i>	18
Figure 3 <i>Bandura's social learning theory</i>	20
Figure 4 <i>Kolb's four stages of learning</i>	21
Figure 5 <i>Phases of Self-Regulated Learning</i>	24

List of Appendices

Appendix 1: Students'questionnaire on Self-directed learning and Critical Thinking 93

List of Abbreviations

CT: critical thinking

EFL: English as a Foreign Language

SCT: social cognitive theory

SDL: self-directed learning

SDT: self-determinism theory

SRLT: self-regulation learning theory

SPSS: Statistical Package of Social Sciences

TLT: transformative learning theory

General introduction

1. Background of the Study

Self-directed learning (SDL) refers to students taking responsibility for their own learning, setting goals, and making decisions about how to achieve them. The concept of (SDL) encourages learners to learn autonomously as well as to engage them in deliberate and planned learning, which refers to any actions that will serve the purpose of learning (Gibbons,2022). Self-directed learners are capable of designing their own learning programs, which are tailored to their specific objectives Ryan and Deci (2020). Furthermore, Critical Thinking is fundamental for students to thrive in academic, professional, and social contexts, as it equips them with the ability to solve complex problems and make impactful decisions in their daily lives (Elder & Elder,2008).

The SDL has been found to promote critical thinking by encouraging learners to engage in metacognitive processes, such as reflecting on their own learning strategies, identifying areas for improvement, and making adjustments as needed. The foundation for understanding how self-control and metacognition contribute to the development of critical thinking is laid by three academics (Zimmerman, 2000; Elder, 2007; Paul, 1995). They all emphasize how important it is for students to be able to evaluate their own cognitive processes, identify potential growth areas, and adjust their study methods. These skills are essential for fostering critical thinking, which involves assessing, synthesizing, and analysing material in order to come to conclusions and address issues. The authors claim that SDL techniques may also foster critical thinking because actively involved students are better able to engage in thought processes and generate more effective solutions to problems.

Knowles (1975) asserts that SDL promotes critical thinking because it gives students the freedom to direct their own education. This tactic encourages the use of critical thinking abilities like inquiry, information searching, and evidence evaluation. Mezirow (1990) argues that self-directed learning is essential for fostering critical thinking because it allows learners to engage in transformative and emancipatory learning. Students can use this approach to challenge presumptions, evaluate the evidence, and develop their own perspectives—all of which are crucial components of critical thinking. In contrast, Brown (1987) argues that metacognition is essential for encouraging critical thinking because it allows students to keep track of their own thought processes, assess the effectiveness of their methods, and make appropriate improvements. He contends that learners who engage in metacognition are better able to identify areas for improvement, come up with more effective problem-solving techniques, and engage in higher-order thinking, all of which are essential components of critical thinking.

Many studies on SDL and its impact on critical thinking have been done (Rawson, 2000; Giese, 2006; Fredriksson and Hoskins, 2007; Hofmann, 2008); Along with fostering critical thinking, self-directed learning has been demonstrated to benefit students in a variety of other ways, including increasing motivation, engagement, and happiness with the learning process. It is imperative to keep in mind that self-directed learning is not always straightforward or clear, and that children may need guidance and help from professors or peers in order to build effective self-regulation strategies. Overall, the research shows that self-directed learning can be a useful method for fostering critical thinking skills, but it requires that learners engage actively in their learning and employ metacognitive strategies to monitor and assess their own thinking.

2. Statement of the Problem

SDL allow students to take charge of their education, create their own learning goals, and select the most efficient path to achieving those goals. These instructional strategies support learner autonomy, responsibility, and self-motivation, all of which are essential for the development of critical thinking skills. The COVID-19 pandemic in 2019 prevented many students from continuing with their traditional teaching methods; as a result, many people developed a sense of independence and were exposed to more self-directed learning techniques in order to continue their education. It puts an emphasis on considering how SDL might be used to achieve this goal and understanding the benefits and drawbacks of this strategy and how it can be successfully used in a variety of learning environments to improve students' critical thinking skills.

3. Research Questions

The questions that call for answers related to background might include:

What are the overall used strategies to develop SDL and CT?

What are the most and the least frequent strategies used by M2 students to develop SDL?

What are the most frequent strategies used by M2 students to develop Critical thinking?

To what extent the use of SDL contributes to CT?.

4. Research Assumptions

In response to the overarching questions that frame this study, it is hypothesized

Hypothesis for question 1

H₀= M2 students do not follow certain strategies of SDL in order to improve their CT.

H1= M2 students follow certain strategies of SDL in order to improve their CT due to their maturity and the experience they gained throughout the academic years the spent at university.

Hypothesis for question 2

H0. SDL do not contribute to CT

H1. SDL contribute to CT due to the practices that M2 students perform to improve their performances.

5. Aims of the Study

Researchers aim to determine how self-directed learning practices, such as setting goals, planning, self-monitoring, and reflection, contribute to the development of critical thinking abilities. This exploration can shed light on the specific aspects of self-directed learning that enhance critical thinking and provide insights into effective instructional strategies.

6. Significance of the Study

The significance of this study lies in the ability to provide instructional approaches that can support students' development of CT skills. The development of this capacity, which has been identified as a requirement for success in both academic and professional settings, is seen as being promoted by SDL as a potential strategy. By evaluating the effects of self-directed learning activities on the development of critical thinking, this study can provide crucial insights into how educators can help students develop higher-order thinking skills. In order to identify answers, the study also highlights factors that may make self-directed learning approaches ineffective. The study's findings may eventually be used to develop research-backed instructional practices that assist students in developing their critical thinking skills and positioning them to be successful in their future endeavours.

7. Methodology

In this dissertation, a non-experimental descriptive research design was employed to examine in depth the impact of the independent variable (Self-directed learning) on the dependent variable (Critical thinking). The purpose of this investigation was to conduct a comprehensive investigation of the contribution of SDL to Ct . Moreover, a mono-method approach was adopted in order to facilitate the integration of quantitative data conceptually and analytically. In order to collect data, a questionnaire was utilized to gather a considerable amount of information and address a broad range of aspects. This study focuses on a target population comprising 38 M2 LS students at the Department of Literature and English, Larbi Tébessi University. These students have studied English for six semesters through three years in their Licence degree also three semesters through Master's first and second years and have experienced self-directed learning, particularly after the COVID-19 pandemic. The entire target population was selected as the sample for the study, utilizing a non-probability purposive sampling technique.

Questionnaire answers were used to calculate the regression among these instruments. Statistical Package for Social Sciences (SPSS) Version 23 was chosen to track the statistical analyses in the current study. A linear regressions as statistical technique was applied to meet the objective of the current study. Brace, Kemp, and Snelgar (2009) outlined that: linear and multiple regression allows the researchers to predict the contribution of one variable based on other variables.

8. Structure of the Dissertation

The current study intends to ascertain the contribution of SLD to the critical thinking abilities of Master Two EFL students at Echahid Cheikh Larbi Tébessi University who are

enrolled in the Language Sciences stream. The research study is divided into two primary chapters: a theoretical chapter reviewing pertinent literature and a practical chapter discussing the research findings.

The theoretical chapter consists of two sections, each providing an overview of each variable. The first section focuses on self-directed learning, delving into various definitions, key principles of the notion, and the importance of the self-directed learning. Also it tackles the theories and models of self-directed learning, along with characteristics and skills of self-directed learners.

The second section of the theoretical chapter centres on critical thinking. It discusses the definition, the role of CT in problem solving in EFL context. Additionally, it highlights the key components of CT and the characteristics of critical thinkers as well as providing a description about the synergistic relationship between self-directed learning and critical thinking and previous studies about the impact of SDL on CT.

Chapter One: Literature Review

Introduction

This chapter canvasses self-directed learning and critical thinking. The first section provides the definition of self-directed learning and its importance in education. It also highlights the key principles, theories and models of SDL. The following section debates critical thinking as a definition and its importance and the components as well as explaining the characteristics of critical thinkers and the synergistic relationship between SDL and CT. Finally mentioning previous studies conducted on the impact of SDL on CT.

1.1. Definition of Self-Directed Learning

Learning how to learn enables an individual to choose and arrange knowledge that is significant and valuable to them based on their own intellectual processes and awareness of their intellectual strengths and shortcomings. The capacity to learn, which serves as the cornerstone of lifelong learning, comprises organizing one's education, managing one's time and knowledge, and being aware of one's learning needs (Turan & Koç, 2018). Improved cognitive, psychological, and motor skills are results of lifelong learning. One of these skills is the capacity for independent study. Knowles (1975) provided one of the earliest, and most widely adopted, definitions. In his view: SD comprises a five-step process: Individuals take the initiative, with or without the help of others, in (1) diagnosing their learning needs, (2) formulating learning goals, (3) identifying human and material resources for learning, (4) choosing and implementing appropriate learning strategies and (5) evaluating learning outcomes. Knowles, 1975, p. 18).

Francis (2017) claims that SDL allows students the freedom and autonomy to decide what, why, how, and where they will learn, which will enable the dimensions of the SDL to be

extracted. Moreover, additionally Candy (1991) indicates that SDL refers to a process where individuals assume responsibility for their learning journey, whether they receive assistance or not. They actively assess their learning requirements, establish learning objectives, identify the necessary resources (both human and material), select and apply suitable learning strategies, and assess the outcomes of their learning endeavors. In this line, SDL is a process in which learners actively and independently identify their requirements for learning, establish clear learning objectives, find the resources (both human and material) they need for learning, make defensible choices about appropriate learning strategies, and evaluate the outcomes of their learning experiences Garrison (1997),.

In the previous definitions, key terms like learner initiative, assessing learning requirements, goal-setting, resource identification, approach selection, and result evaluation were highlighted. They emphasize the importance of the learner's active involvement and responsibility for managing their own learning, frequently with the opportunity to enlist the aid of others.

1.2. Importance of SDL in Education

SDL has existed even from classical antiquity. Self-study, for instance, was crucial to the careers of Greek philosophers like Socrates, Plato, and Aristotle. Alexander the Great, Caesar, Erasmus, and Descartes are some further historical figures who demonstrated self-directed learning. Colonial America's social circumstances and the consequent absence of official educational institutions made it necessary for many people to learn on their own.

SDL is important in the educational setting of today. Students in impoverished countries now have practically continuous access to vast amounts of data. Due to these factors, society is

rapidly changing, which makes it challenging for educational institutions to properly prepare students for labor market demands. In addition to subject-specific knowledge, these requirements call for skill-based competencies in problem-solving, reflection, and curiosity. They also call for creativity, collaboration, written and verbal communication, accepting and using critical feedback, applying knowledge to real-world problems, and managing and supporting ongoing change (Toit-Brits, 2019). According to Elias and Merriam (1995) (as cited in Morris, 2019), the individual nature of (SDL) emphasizes autonomy, choice, and self-actualization. Therefore, learners are viewed as autonomous and capable of smart decision-making, have a sense of responsibility to themselves and others, are inherently good-natured, have a desire to reach self-actualization, and have a unique and unlimited potential for growth. In this vein, Hiemstra (2001) stated that self-directed learning encourages continuous improvement in abilities and a development attitude. Learners become autonomous and adaptive by learning how to recognize their own educational needs, create objectives, and track their advancement. They develop the abilities required to seek lifelong learning and adjust to the demands of society and the changing state of knowledge.

SDL is now commonly regarded as a beneficial educational strategy. It is regarded as crucial for generating intrinsic motivation, advancing lifelong learning, and improving critical thinking abilities. Self-directed learning is incorporated into the curriculum of many educational institutions and programs, encouraging students to take charge of their own education. For educational systems to prepare students for success in a world that is always changing, self-directed learning methodologies must be implemented.

1.3. Key Principles of SDL

The main tenets of SDL center on giving students the freedom to determine their own educational paths and developing their initiative, self-awareness, and independence as learners. Some of the key principles of self-directed learning are as follows:

1.3.1. Autonomy

SDL provides a strong emphasis on the learner's autonomy and controlling their education. Learners have control over what they learn and may decide how, what, and when they study. Knowles (1975) underlined that autonomy in self-directed learning refers to the flexibility that learners have to choose their learning objectives, approaches, and tools. Students actively engage in the educational process and accept accountability for their choices and deeds. Furthermore, Candy (1991) claimed that autonomy requires students to manage their own education through self-direction. It includes the capacity of learners to recognize their learning requirements, establish objectives, and track their advancement. As given the freedom to choose their own learning path, autonomous students may do so without outside assistance or direction as necessary. In addition, Merriam and Bierema (2013) stated that having the flexibility to use one's own discretion and come to decisions that are congruent with one's values, desires, and aims constitutes autonomy in self-directed learning. Students can tailor their learning experiences by using their goals and motivations. Researchers frequently define autonomy in self-directed learning as the ability of the student to be self-directed, autonomous, and inspired in their educational process. Students' enthusiasm, sense of control, and capacity for lifelong learning increase when they are given the freedom to make their own decisions, take responsibility, and actively engage in their studies.

1.3.2. Self-Regulation

Self-Regulation is the ability to plan, direct, and control one's emotions, thoughts, and behaviors during a learning task. Self-directed students demonstrate self-regulation by effectively planning their time, setting goals, and managing their workload. They develop self-control, focus, and tenacity to sustain their motivation and continue working toward their learning goals. Boekaerts (1997) emphasized the significance of learners' motivation and emotional regulation in this regard. In order to increase their involvement and endurance in learning tasks, self-regulated learners can manage their enthusiasm by setting goals, generating assignment interest, and managing their sentiments. Zimmerman (2002) claims that self-regulation includes a learner's skill to set goals, evaluate their progress, and adjust their methods as appropriate. It includes three essential procedures: self-reflection (examining results and attributions), accountability (continuous assessment and modifications), and foresight (thinking and objective formulation). Self-regulated learners actively participate in these processes to effectively manage their learning. In particular, Efklides (2006) stressed that a crucial aspect of self-regulated learning is the ability of students to manage cognitive activities, such as memory, concentration, and problem-solving. Self-regulated learners regularly evaluate and adjust their cognitive strategies to optimize their learning outcomes. The previous researchers (Aly et al., 2003; Mamary and Charles, 2003; Beach, 2017; Sawatsky et al., 2017) emphasized that learners' abilities establish objectives, check their advancement, modify their techniques, control their motivation and feelings and fully participate in metacognitive processes all contribute to self-regulation in SDL. In order to maximize their educational prospects, self-regulated learners employ a number of cognitive and metacognitive strategies in addition to deftly managing their emotions and motivation.

1.3.3. Motivation

Motivation is crucial for self-directed learning because it influences students' interest in, dedication to, and success in their academic activities. In their research on motivation, scholars have highlighted that motivation plays a significant role in engaging learners in SDL activities and sustaining their efforts throughout the learning process (Lepper, Corpus, & Iyengar, 2005; Gillet, Vallerand, & Lafreniere, 2012; Gottfried, Marcoulides, Gottfried, Oliver, & Guerin, 2007; Scherrer & Preckel, 2019). By actively participating in setting their own learning goals, selecting appropriate strategies, and monitoring their progress, learners who are motivated to engage in SDL demonstrate increased autonomy, perseverance, and a sense of ownership over their learning. Harter (1996) emphasized the significance of students' evaluations of their skill and proficiency in self-directed learning. Students are more motivated to learn and more ready to engage in self-directed learning activities when they feel competent and capable of succeeding in their academic undertakings. Vygotsky (1978) emphasized the requirement for outside motivation in order to promote learners' growth. Different factors, such as the support and encouragement students receive from professors and classmates, can serve as inspiration for learners. Collaborative learning environments can boost motivation by encouraging a sense of belonging and a common goal. Meanwhile Deci and Ryan (1985, 2000) focused on the importance of the internal motivation like), contend that internal motivation, which includes internal elements like curiosity and satisfaction, is essential for self-directed learning. Students that are naturally motivated have a genuine interest in learning, seeking out challenges, and achieving their academic goals. Together, the perspectives of these researchers showed how both intrinsic and extrinsic factors, such as interest and enjoyment, may affect motivation in self-directed learning. It is critical to take into account learners' motivational tenets, achievement

goals, views of independence, and competency in order to inspire them and encourage engagement and perseverance in self-directed learning (Wang et al., 2017).

1.3.4. Initiative

Initiative is a fundamental element of (SDL), highlighting the learner's proactive and active involvement in directing their learning journey. As stated by Knowles (1975), self-directed learners exhibit initiative by assuming control over their education. They take proactive measures to identify their educational needs, establish learning objectives, and select optimal learning methods. Moreover, demonstrating initiative in SDL entails students investing effort to develop a personalized educational strategy and undertaking the necessary actions to achieve their learning goals. Learners take the lead in directing their own learning by conducting independent research and making choices (Hiemstra, 1994). Self-directed learners choose and put into practice effective learning techniques on their own. Based on their goals, requirements, and preferred methods of learning, they modify their strategies (Garrison, 1997).

In nutshell, initiative in SDL requires learners to be actively involved, make proactive decisions, and take initiative in their own actions. Self-directed learners use the initiative to determine their learning requirements, create objectives, choose tactics, and look for help and resources. Their initiative leads their learning process and gives them the opportunity to customize their educational opportunities to suit their individual interests, preferences, and objectives.

1.3.5. Reflection

Self-directed learners engage in reflective practices to evaluate their progress, identify their strengths and weaknesses, and adapt their learning strategies as needed. They actively reflect on their learning experiences and make necessary adjustments to enhance their learning outcomes. The importance of reflection in professional growth and development was emphasized by Schön (1983). Reflective practice involves critically analyzing one's observations and behaviors to acquire knowledge, improve effectiveness, and make informed decisions. Boud et al. (1985) introduced the concepts of reflection-on-action and reflection-in-action to capture different dimensions of reflective practice. While reflection-on-action refers to looking back on prior events to evaluate and gain insight from them, reflection-in-action describes the capacity to reflect and make modifications in real-time while an assignment or activity of learning is continuing.

Reflection, according to Moon (2004), involves reflecting analytically and in-depth about one's life events, views, and presumptions. In order to obtain knowledge and enhance their educational techniques, students who are reflective participate in metacognitive procedures including questioning themselves, self-evaluate, and awareness of themselves. It is important for learners to be able to critically analyze their knowledge, views, and presumptions during reflecting on self-directed learning to derive significance from what they are learning. Learning via reflection helps students discover new perspectives, comprehend concepts better, and constantly refine their methods and tactics for learning. It promotes critical thinking, transformational learning, and self-awareness (Moon ,2004)

1.3.6. Flexibility

Flexibility is a key concept in self-directed learning because allows students to alter their educational plan in response to their shifting needs, preferences, and circumstances. Garrison (1997) stressed the value of flexibility in self-directed learning by emphasizing that students have the option to choose and modify their learning strategies in accordance with their individual learning preferences, wants, and goals. Students can tailor their educational experiences to meet their own needs and interests because to flexibility. According to Candy (1991), self-directed learners have a flexible approach to learning. They are flexible and willing to try out different teaching methods, techniques, and resources. Students that are flexible may adjust to challenges, look into new learning possibilities, and change their strategies to maximize the learning process. Self-directed learners are adaptable in their learning styles and recognize the need of ongoing study and improvement. They are adaptable when it comes to changing their goals and looking into new options when circumstances change or new interests arise. Moreover, opportunities for learning and modifying their approaches (Hiemstra, 1994); the capacity of students to evolve, modifies, and investigates various ways, assets, and tactics is referred to as flexibility in self-directed learning. Students who are self-directed are flexible in their learning objectives, open to new concepts, and receptive to alterations in their educational setting. Thus, flexibility helps students to tailor their educational experiences, seize new possibilities, and maximize their progress (Hiemstra, 1994).

1.3.7. Collaboration

Self-directed learning places emphasis on autonomy while acknowledging the significance of collaboration. Learners engaging in self-directed learning actively seek

meaningful connections with peers, mentors, and teachers to exchange thoughts, receive input, and benefit from shared wisdom and experiences. Vygotsky (1978) emphasized the value of teamwork in the learning process, asserting that interacting with individuals who possess greater knowledge assists learners in acquiring information and skills. In collaborative educational environments, students are afforded opportunities to exchange ideas, collaborate on problem-solving, and support each other's academic development. In line with the aforementioned perspective, collaborative learning settings have been found to be advantageous for self-directed learning, as highlighted by Johnson and Johnson (1999). Collaborative endeavors facilitate positive interconnections, personal responsibility, and the development of interpersonal skills. When students collaborate to achieve shared learning objectives, a sense of community and shared accountability is fostered. Dillenbourg (1999) asserts that collaborative learning involves the joint construction of knowledge through interactions with others. Learning in collaborative settings promotes deeper comprehension and the co-creation of information through stimulating debates, discussions, and the exchange of ideas. In the context of self-directed learning, collaboration involves learners actively engaging in interactions with others, participating in teamwork, and experiencing collaborative educational opportunities. Learners can benefit from the diverse experiences, perspectives, and support provided by others in educational contexts. Collaboration enhances students' self-directed learning by fostering the development of interpersonal skills, critical thinking, and a deeper understanding of the subject matter.

1.4. Theories and Models of Self-Directed Learning

Self-directed learning can be characterized by a number of prominent theories and models

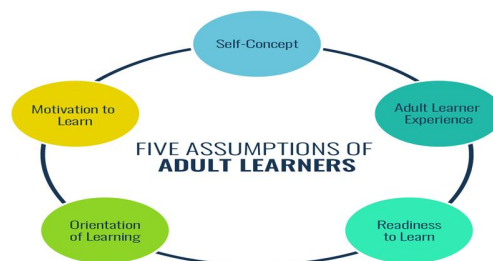
1.4.1. Andragogy Theory (Malcolm Knowles)

The andragogy theory, a paradigm focused on adult learning and the unique needs and characteristics of adult learners, was developed by Malcolm Knowles (Knowles, 1980). Knowles published several significant andragogy concepts that distinguish adult learning from that of children or teenagers. A few of these concepts are self-direction, experience, willingness to learn, learning orientation, motivation to learn, and adult learner experience (Knowles, 1984).

Following is an illustration of this:

Figure 1

Five Assumptions of Adult Learners



Note. From “*WHAT IS MALCOLM KNOWLES’ ADULT LEARNING THEORY?*”, by A. Virtanen, 2023, . <https://www.growthengineering.co.uk/what-is-malcolm-knowles-adult-learning-theory/>

Knowles (1984) presented a figure outlining the five defining characteristics of adult learners. According to Knowles, adult learners are characterized as independent and self-directed individuals who assume responsibility for their own education. Drawing upon their wealth of past experiences, adult learners serve as a valuable resource in the learning process. When the learning content is perceived as relevant and beneficial to their current jobs, needs, and

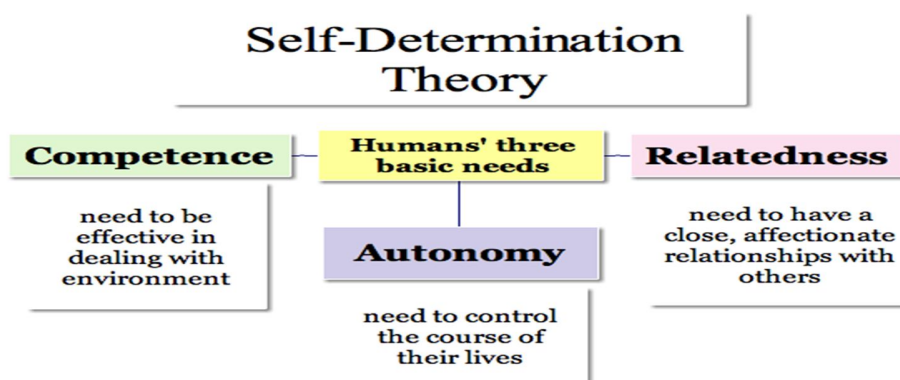
aspirations, adult students exhibit heightened motivation to engage in studying. They approach education from a problem-centered perspective and are primarily driven by intrinsic motivation. In the context of andragogy, instructors take on the role of facilitators or guides, encouraging students to take ownership of their learning while fostering an environment that promotes active participation and collaborative projects (Knowles, 1980). These principles provide guidance for instructors to develop and deliver captivating lessons tailored to the specific requirements and characteristics of adult learners.

1.4.2. Self-Determination Theory (Edward Deci and Richard Ryan)

The Self-Determination Theory (SDT), developed by Edward Deci and Richard Ryan (1985), is a psychological paradigm that focuses on human motivation and the conditions that support ideal performance and satisfaction (Deci & Ryan, 1985). Autonomy, competence, and relatedness are depicted in figure 2 as the three fundamental psychological conditions that persons must satisfy in order to be motivated and act of their own free will.

Figure 2

Self-Determination Theory



Note. From “*Self Determination Theory and How It Explains Motivation*”, by C. Ackerman, 2023, <https://positivepsychology.com/self-determination-theory/>

The figure presented above depicts Self-Determination Theory (SDT) and its three fundamental needs, as outlined by Deci and Ryan (1985). Autonomy, as defined by Deci and Ryan, refers to the desire for initiative and the awareness of being able to actively participate in one's activities. It involves living in alignment with one's ideals, interests, and goals. Autonomy-supportive environments foster intrinsic motivation and yield optimal outcomes in academic and professional achievements by affording individuals the opportunity to make meaningful decisions and engage in independent pursuits (Deci & Ryan, 2000). According to SDT, individuals perform better when they perceive themselves as competent in their tasks, possess a sense of proficiency, and experience success (Deci & Ryan, 1985). Environments that offer opportunities for skill development, input, and challenges aligned with individuals' abilities and passions enhance performance. Furthermore, relatedness, as described by Deci and Ryan (1985), refers to the desire to connect with and be a part of others. Positive relationships and meaningful connections foster motivation, engagement, and well-being.

SDT suggests that when people's needs for autonomy, competence, and relatedness are met, they are more likely to experience intrinsic motivation, engagement, and happiness. Conversely, neglecting these needs may result in diminished levels of happiness, satisfaction, and motivation (Deci & Ryan, 2000).

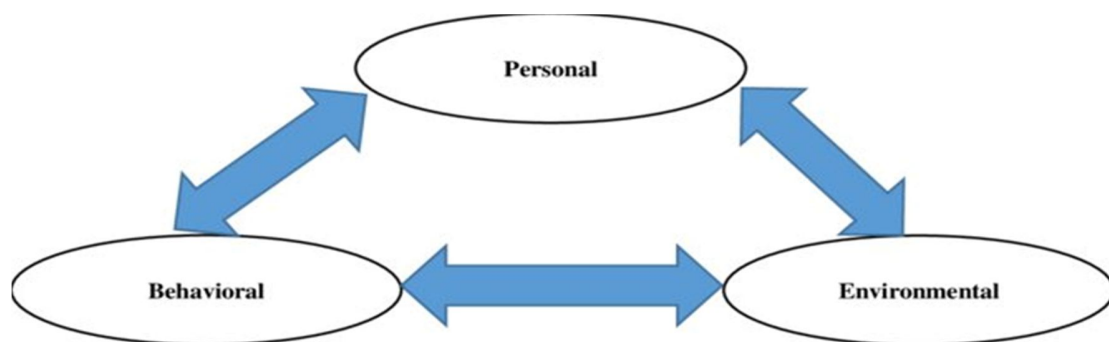
1.4.3. Social Cognitive Theory (Albert Bandura)

The Social Cognitive Theory (SCT), developed by Albert Bandura in 1986, is a psychological theory that places a strong emphasis on how social contact, cognitive processes,

and observational learning, as seen in figure 3 below, influence behavior. Bandura contends that people form new habits by imitating the behavior of others, observing the outcomes of their actions, and repeating the process.

Figure 3

Bandura's social learning theory



Note. From “Social Media and Its Impact on Arab Youth Identity”, by M. Alshoaibi, 2018, <https://doi.org/10.5539/res.v11n1p1>

Bandura (1986) proposed that Social Cognitive Theory (SCT) operates through three fundamental elements. Firstly, observational learning, also known as social learning or modeling, is the process by which individuals acquire new habits or skills by imitating the behaviors of others. Various factors such as motivation, development, retention, and attention influence this learning process.

Secondly, self-efficacy is a crucial element within SCT. Self-efficacy refers to an individual's belief in their ability to successfully perform a specific action or task. Bandura emphasized that self-efficacy plays a significant role in motivation and behavioral change. Individuals with high self-efficacy are more likely to engage in activities, persist in the face of challenges, and achieve desired outcomes.

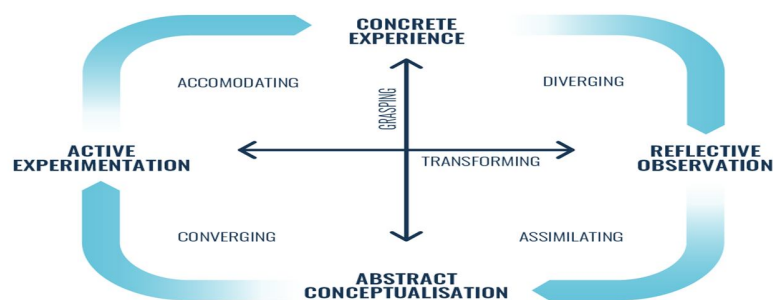
The third element is reciprocal determinism. Bandura (2001) argued that cognitive processes, beliefs, traits, as well as behavioral and environmental factors, such as societal norms and physical surroundings, constantly interact to influence human behavior. According to reciprocal determinism, people's actions and thought processes both influence and are influenced by their environments. Based on SCT, individuals actively engage in cognitive processes, including memory, attention, and reasoning, when observing and imitating behavior. They also contemplate the consequences and outcomes of their choices, which can impact their motivation and future behavior (Bandura, 2001)

.1.4.4. Experiential Learning Theory (David Kolb)

David Kolb's Experiential Learning theory in 1984 emphasizes the value of experience in the educational process. The four phases of studying, according to Kolb, are active experimentation, abstract conceptualization, reflective observation, and concrete experience (see figure 4).

Figure 4

Kolb's four stages of learning



Note. From “WHAT IS KOLB’S EXPERIENTIAL LEARNING THEORY?”, by A.Virtanen, 2022, <https://www.growthengineering.co.uk/kolb-experiential-learning-theory/>

Figure 4 represents Kolb’s four stages of learning. Beginning with the first phase of the learning cycle; learners participate in direct and active experiences. The next step is reflective observation, during which students reflect on their emotions, ideas, and perceptions in the context of their previous experiences. Through abstract conceptualization, learners create generalizations, ideas, and notions based on what they have learned. Active experimentation is the process of putting recently learned concepts and ideas into real-world problems and then learning from the outcomes (Kolb, 1984). Kolb has also put out a variety of learning theories in the framework of experiential education. Diverging (the sensation and observing), assimilating (the ability to think and view), converging (imagining and performing), and accommodating (a sense of being and acting) are some of the categories that apply to it (Kolb, 1984).

1.4.5. Transformative Learning Theory (Jack Mezirow)

Jack Mezirow established the transformative Learning Theory (TLT) in 1991, which focuses on the transformational learning process and how it might result in societal as well as individual change. Mezirow believed that transformational learning entails critically examining one's viewpoints, opinions, and preconceptions to produce an important change in knowledge. Mezirow (1991) put out several of essential components and phases of transformational learning, including: Discomforting Problem, the transformative learning frequently starts with a confusing dilemma, a circumstance, or an event that questions a person's preexisting ideas, presumptions, or perspective. This dilemma causes mental dissonance and causes people to reevaluate their ideas. The following phase is self-reflection, in reaction to the perplexing situation, people

practice self-reflection by analyzing their expectations, standards, and opinions. They examine different viewpoints and options while challenging the assumptions behind their expertise.

Exploration of Alternatives, in this phase, people look into and evaluate various points of view while searching for fresh knowledge and different opinions.

Moreover, they converse, interact with numerous parties, and diligently search for fresh information and viewpoints. Moreover, in integration people start incorporating fresh ideas and understandings into their current worldviews via analytical contemplation and investigation. They rediscover their convictions and interpret what they have seen in accordance with their fresh perception. Transformative learning entails taking action according to newly acquired knowledge and is not only an academic endeavor. Another phase is action, people can take transformational action, and support shifts, and uses their new insights in their societal or personal situations. The perspective transformation phase is the change in viewpoint or vision is the result of transformational learning. People undergo a profound transformation in their beliefs, attitudes, and principles, which leads to personal development, enhanced self-awareness, and a stronger feeling of societal duty. The importance of careful examination, evaluation, and flexibility in the process of learning is highlighted by transformative learning theory. It implies that education that is transformational may take place in a variety of settings, including formal education, career advancement, and everyday encounters (Mezirow, 1991).

1.4.6. Self-Regulated Learning Theory (David Zimmerman)

Barry Zimmerman's Self-Regulated Learning Theory (SRLT) focuses on how students diligently and intentionally manage their own education. It places a strong emphasis on how

metacognition, motivation, and autonomy play a part in learning well. Three crucial processes are involved in self-regulated learning, according to Zimmerman (2000) represented in figure 5.

Figure 5

Phases of Self-Regulated Learning



Note. From “Encouraging Self-Regulated Learning in the Classroom_A Review of the Literature”, by Zumbrunn et al., 2015, <https://doi.org/10.13140/RG.2.1.3358.6084>

Figure 5 represents the three processes; planning is the process by which learners come up with a plan of action for achieving their objectives after deciding on the assets and tactics required. This stage also entails creating a timetable for work completion and establishing reasonable standards. The second process monitoring, throughout the educational process, students keep a close eye on their progress, understanding, and growth. They examine their methods, examine their comprehension, and pinpoint any aspects that are unclear or challenging. In order to ensure that educational objectives are being accomplished, supervising also entails controlling one's focus and exertion. The last process is reflection, following the completion of an assignment or experience of learning, students reflect. They assess their performance,

consider the success of their plans, and pinpoint their areas for development. Self-evaluation and developing methods of learning are other aspects of reflection (Zimmerman, 2000).

Furthermore, Zimmerman (2000) identified various self-regulation techniques that students can employ to enhance their learning. These techniques include setting goals by establishing concrete, challenging, and attainable objectives. Self-monitoring, on the other hand, involves assessing one's progress, development, and understanding. Another technique, known as self-instruction, involves providing oneself with instructions or engaging in self-talk. Effective time management is a valuable technique that entails prioritizing activities. Environmental structuring involves arranging the learning environment to optimize concentration and productivity. Seeking help refers to recognizing when and how to seek support or additional resources. Lastly, self-evaluation involves critically examining one's achievements and determining the standard of education attained.

The theory of self-regulated learning emphasizes the importance of students actively engaging in their educational experiences and taking control of their cognitive, motivational, and emotional processes. Developing self-regulation skills helps students become more autonomous, adaptable, and successful in their academic pursuits.

1.5. Characteristics and skills of Self-Directed Learners

Self-directed learning encourages people to take charge of their own learning processes through a dynamic and revolutionary approach to education. It is defined by students taking ownership of and responsibility for their educational experiences and directing their own learning through autonomy, curiosity, self-reflection, goal-setting, and adaptation. Self-directed learning has been thoroughly studied and contributed to by scholars like Knowles (1975), and

Csikszentmihalyi (1990). The value of learners' autonomy, intrinsic motivation, reflective practices, goal-oriented mentality, and adaptability in promoting self-directed learning environments has been highlighted by their research. Together, these qualities produce a learning environment that encourages critical thinking, personal development, and lifelong learning. Each characteristic is represented as follow:

1.5.1. Self-awareness and Metacognition

In order for learners to monitor, control, and maximize their learning experiences, self-awareness and metacognition play crucial roles in self-directed learning. Individuals who are self-conscious are aware of their own ideas, feelings, and behaviours as they relate to their learning process (Zimmerman, 2002). It enables students to identify their preferences, learning preferences, and strengths and shortcomings. This awareness is crucial for self-directed learning because it enables students to decide on their learning tactics and pinpoint areas that require development. On the other side, metacognition is the act of reflecting on one's own thought and learning processes (Zimmerman, 2002). It entails the capacity to keep track of and regulate one's cognitive functions, including the ability to organize, plan, and assess one's learning efforts. Learners can set objectives, create strategies, and evaluate their progress towards those goals thanks to metacognitive practices. Learners can assess their comprehension, discover knowledge gaps, and reflect on their learning by engaging in metacognition.

Self-awareness and metacognition are major contributors to self-directed learning. Higher degrees of metacognitive awareness are associated with a greater likelihood of learners engaging in self-regulated learning practices, according to Zimmerman (2002), they are more reflective about themselves, set more difficult goals, and use powerful learning techniques.

Similar to this, Schraw and Moshman (1995) underlined that learners can assess the efficacy of their learning strategies and make necessary adjustments when they have self-awareness and metacognitive skills. Developing self-awareness and metacognition is crucial in self-directed learning situations. Learners can actively monitor their comprehension, evaluate the relevance and validity of information, and modify their learning tactics by being aware of their own cognitive processes. Learners who engage in metacognitive practices have a better grasp of their own strengths and shortcomings, which help them, choose resources, study methods, and learning experiences wisely.

1.5.2. Goals Setting and Planning

Setting goals and making plans are essential elements of self-directed learning because they give students a sense of purpose, inspiration, and a direction for their academic path. According to Locke and Latham (1990), when people make goals, they create SMART (specific, measurable, achievable, relevant, and time-bound) objectives that act as benchmarks for their learning process. These objectives assist students maintain focus on their intended results and offer them a clear feeling of purpose. Setting goals has a positive effect on learning outcomes. According to Locke and Latham (1990), creating difficult and precise goals can improve people's motivation and performance. When students have clear objectives, they are more likely to put up the work necessary to reach those objectives as well as to persevere in the face of difficulties. Goals also offer a structure for organizing and planning learning activities. Learners can efficiently organize their time, distribute resources, and track their progress by breaking larger objectives down into smaller, achievable activities (Zimmerman, 2002).

Goal-setting and planning support the learners' agency and autonomy in self-directed learning. Individuals take an active role in their educational journeys by creating their own goals and learning pathways. Planning and creating goals also provide students a sense of achievement as they work toward their goals, which boosts their self-confidence and drive (Zimmerman, 2002).

1.5.3. Time Management and Organization

In order to successfully spend their time, resources, and efforts to maximize their learning experiences, learners need to be organized and have good time management abilities. The ability to prioritize projects, set deadlines, and allot time for different learning activities are all aspects of time management. It enables students to utilize their free time effectively, ensuring that they give their learning objectives enough thought and effort (Macan et al., 1990). Learning how to manage their time well can help students stay on task, prevent procrastination, and maintain a balanced approach to their studies. By giving students' learning processes structure and clarity, organization supports time management. It entails methodically arranging notes, resources, and study materials to facilitate simple retrieval and referencing. Learners who are more organized are better able to control the flow of information, find pertinent resources, and have a consistent conceptual framework. In order to provide students with a conducive environment that reduces distractions and fosters productivity, organization extends to the physical and digital locations where learning takes place (Vonk et al., 2017).

Time management and organization have a positive effect on learning outcomes, according to research. According to Macan et al. (1990), students who are good time managers are more likely to engage in deeper learning activities including reflection, critical thinking, and

knowledge application. Learners can more easily access knowledge, draw connections, and improve their grasp of complicated concepts by arranging their materials and resources. Additionally, effective time management and organization result in lower stress levels and higher levels of self-efficacy, empowering students to approach their academic assignments with assurance and resiliency. Time management and organizational skills enable learners to take charge of their educational journeys in self-directed learning. By efficiently managing their time, students may manage their many responsibilities and set aside time for concentrated learning. Learners that are organized are better able to organize their resources, establish study habits, and create an environment that promotes learning. These abilities encourage a sense of control and agency, empowering students to handle challenging assignments, adhere to deadlines, and accomplish their academic objectives (Macan et al., 1990).

1.5.4. Information Seeking and Resource Utilization

The use of resources and the search for information are essential parts of self-directed learning. Individuals who self-direct their learning are in charge of determining their learning needs, making goals, and actively looking for pertinent knowledge from a range of sources. When looking for trustworthy and current information, it is important to use techniques like database searches, literature reviews, and expert consultation. It necessitates that people critically assess the veracity and applicability of the material they come across in order to make sure that it is consistent with their learning goals. On the other side, resource utilization entails using available resources as effectively as possible to assist learning. Books, articles, online courses, multimedia content, and educational technologies are some examples of these resources (Marzano et al., 2001).

People can improve their comprehension, gain new abilities, and apply what they have learned to practical situations by making appropriate use of these resources. However, in order to guarantee that the materials are appropriate for their learning objectives, it is crucial for people to critically assess the quality and relevancy of the resources. Additionally, a crucial component of self-directed learning that encourages critical thinking, problem-solving, and lifelong learning is the capacity to integrate and synthesize data from many sources and make optimal use of resources. Strong information-seeking and resource-use abilities enable people to learn independently and adaptably, enabling them to acquire knowledge and skills outside of typical educational settings (Marzano et al., 2001).

1.5.5. Critical Thinking and Problem Solving

Self-directed learners actively seek out and assess information from a variety of sources to guide their learning process, which requires critical thinking. They examine presumptions, apply logical reasoning, and assess the veracity, relevance, and validity of information in order to generate well-informed opinions on the things they come across. Self-directed learners who use critical thinking are better able to discriminate between trustworthy and questionable sources, evaluate various viewpoints critically, and synthesize data to gain a deeper grasp of a subject. Furthermore, self-directed learners need problem-solving abilities to get past obstacles, knowledge gaps, and strange scenarios they come into while learning. Self-directed learners participate in problem-solving activities to recognize and characterize issues, compile pertinent data, come up with and assess viable solutions, and carry out the best course of action. They exhibit perseverance, flexibility, and the capacity to think critically and creatively in order to solve issues and meet their learning goals (Garrison, 1997).

Individuals can improve their capacity to set well-informed learning goals, identify pertinent resources, assess the caliber of information sources, and develop efficient strategies to acquire and apply knowledge and skills by incorporating critical thinking and problem-solving into their self-directed learning approach. These abilities enable self-directed learners to think for themselves, assess the accuracy and usefulness of information, resolve challenging issues, and continuously adjust and enhance their learning process (Garrison, 1997).

1.5.6. Reflection and Self-evaluation

Self-directed learning incorporates reflection and self-evaluation, which are essential for promoting metacognition, expanding understanding, and encouraging personal development. In order to develop understanding and give the learning process significance, reflection entails the active and intentional activity of critically examining one's thoughts, experiences, and actions. Contrarily, self-evaluation is the process of evaluating one's own performance, progress, and learning outcomes in light of established standards or objectives. Individuals engage in a cyclical process of monitoring, assessing, and modifying their learning processes and behaviours through reflection and self-evaluation.

In order to facilitate effective learning experiences, reflection and self-evaluation are important, according to research. Schön (1983) asserts that reflection-in-action and reflection-on-action allow people to gain a better knowledge of their own thought processes, see prejudices or presumptions, and come up with new ideas or solutions. Individuals who reflect on their learning experiences can see patterns, connections, and knowledge gaps, which enable them to adjust their learning objectives and tactics accordingly. Furthermore, self-evaluation enables students to evaluate their performance and progress, pinpoint their strong points and areas for development,

and set new objectives (Zimmerman, 2000). This procedure encourages self-control as well as a sense of personal ownership and accountability for one's own learning. Effective reflection and self-evaluation can be facilitated by a variety of methods and strategies. For instance, journaling offers a structured platform for people to write down their ideas, observations, and reflections on their learning process. Individuals have the chance to learn from others' viewpoints, test their presumptions, and engage in critical discourse through peer feedback and group discussions (Topping, 2003). In addition, using rubrics or criteria-based assessments allows students to compare their work to predetermined standards or expectations, which promotes self-awareness and aids in goal-setting (Andrade & Du, 2005).

2. Definition and significance e of Critical Thinking

Critical thinking has been defined differently by various scholars and experts throughout history, making it difficult to pinpoint a precise definition. However, it is evident that the definition of critical thinking has evolved over time, reflecting the changing social, technological, and philosophical landscape. Critical thinking is best understood by philosophers and psychologists who have studied it from different angles and perspectives. The earliest recorded instance of critical thinking is believed to have originated from the teachings of Socrates, which were recorded by Plato. Over time, the definition of critical thinking has become more insightful and complex, incorporating new perspectives and ideas. In the modern-day, we no longer rely on the limits of our single mind to access the information resources we need to solve problems. Paul (2013) claimed that "Critical thinking is the intellectually disciplined process of actively and skilfully conceptualizing, applying, analysing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action."

The current definition of critical thinking involves the use of criteria, self-correction, and sensitivity to context, and skilful and responsible thinking that leads to good judgment. It is not only limited to cognitive skills but also includes attitudes, affective and ethical issues. The ultimate goal of critical thinking is to improve human functioning, safety, health, and emotional well-being. Therefore, it is clear that the definition of critical thinking has changed over time to reflect new ideas, perspectives, and societal changes. Whereas in today's complex and fast changing world, critical thinking is crucial. It refers to the capacity for dispassionate information and idea analysis, evaluation, and the interpretation, as well as the capacity for logical reasoning and sound decision-making, people that are capable of critical thinking is able to address issues and challenges with a rational and analytical mentality. It entails dissecting many viewpoints, breaking down difficult problems into digestible pieces, and coming up with logical answers. This ability is extremely beneficial in a variety of fields, such as education, business, science, and daily life (Paul & Elder, 2019).

Numerous studies (Ennis 1962; Fisher & Scriven 1997; Johnson 1992) have emphasized the significance of critical thinking in academic contexts. For example, Abrami et al.'s 2008 study established a correlation between critical thinking skills and academic success. Students who demonstrated stronger critical thinking abilities showed a higher likelihood of achieving academic excellence across various subjects. Moreover, critical thinking extends beyond academic accomplishments and holds equal importance in professional environments. According to a poll conducted by the American Management Association (AMA) in 2012, over 70% of employers recognized critical thinking and problem-solving skills as essential for workplace success. The ability to think critically is fundamental, with broad applications in both academic and professional settings. Its value lies in empowering individuals to think

independently, solve problems, and make well-informed decisions. Extensive research has revealed the indispensability of developing critical thinking abilities for academic performance, professional growth, and lifelong learning, a sentiment shared by employers.

2.1. Role of critical thinking in problem-solving in EFL context

Smith (2020) highlights the significant role of critical thinking in problem-solving within the realm of English as a Foreign Language (EFL). Critical thinking empowers students to identify and evaluate linguistic barriers that impede comprehension and communication. By critically analysing their language proficiency, learners can pinpoint areas of difficulty and devise effective solutions. Moreover, critical thinking equips EFL students with the ability to pose pertinent questions, consider alternative perspectives, and break down challenges into manageable components. This cognitive skill enables individuals to select appropriate linguistic tools, employ effective communication techniques, and assess the reliability and pertinence of information sources. By considering diverse viewpoints and cultural influences, EFL students broaden their understanding and cultivate empathy. Furthermore, critical thinking fosters creativity, allowing students to generate original ideas and innovative solutions. Reflective thinking also facilitates self-evaluation and continual personal growth

2.2. Key Components of Critical Thinking

The ability to critically assess information, generate defensible conclusions, and effectively solve complicated problems is a crucial life skill. It includes a number of key components that combine to improve one's cognitive functions and decision-making processes. We will examine the essential components of critical thinking and their importance in creating a critical thinker who is well-rounded. Individuals can hone their analytical talents, strengthen their

ability to reason, and become better at navigating the intricacies of the modern world by knowing these components (Brookfield, 2012).

2.2.1. Analysis

Breaking down complex information or events into their constituent parts, analyzing their interrelationships, and deriving meaningful conclusions is the central process of analysis (Paul & Elder, 2006). It requires a systematic approach, careful attention to detail, and the ability to identify patterns, connections, and underlying meanings. Analytical thinkers meticulously evaluate arguments, statistics, evidence, and various types of information, employing logical reasoning and assessing the reliability and credibility of sources. They consider multiple perspectives and employ critical evaluation to arrive at well-informed conclusions or answers. Through analysis, individuals can uncover hidden insights, identify potential errors or gaps in their thinking, and arrive at informed conclusions. The capacity to navigate complex situations, solve problems, and draw logical conclusions based on evidence and reasoning is a versatile skill applicable in academic, professional, and everyday life contexts. The foundational skill of analysis in critical thinking empowers individuals to engage with material critically and reach reasoned conclusions (Paul & Elder, 2006)

2.2.2. Evaluation

The assessment and judgment of facts, claims, theories, or circumstances in light of predetermined criteria or standards constitutes evaluation, an essential part of critical thinking. In order to assess the calibre, validity, relevance, and credibility of the information or assertions at hand, people must study the available evidence, take into account a variety of viewpoints, and reach well-informed conclusions. When evaluating arguments, logical fallacies, and source credibility, evaluative thinkers use critical thinking to determine the merits and shortcomings of

each side's position. They work to separate evidence from presumptions, separate reality from opinion, and evaluate the relative merits of various points of view. In addition to evaluating the content being presented, evaluation also requires taking into account the context and any possible biases Ennis (1987, 1991; Facione 1990). People can generate well-reasoned judgments, make informed decisions, and identify the most accurate and dependable information through evaluation. This ability is crucial for making decisions in both the professional and personal spheres of life as well as for academic research and problem-solving. A person's ability to evaluate material critically and generate sound conclusions based on facts and logic increases as they develop their evaluative skills Bailin et al. (1999, Facione, Facione, & Giancarlo ,2001).

2.2.3. Inference

Inference refers to the logical conclusions or deductions individuals draw based on facts, evidence, and their own thinking. It involves using available information to make rational and well-supported judgments. The ability to make accurate and well-founded inferences is crucial in critical thinking as it allows for the analysis and evaluation of arguments, the assessment of information source reliability, and the formulation of reasonable conclusions (Paul & Elder, 2006)

2.2.4. Interpretation

A key component of critical thinking is interpretation, which involves attributing meaning and significance to information, texts, or experiences in order to comprehend them. It goes beyond surface-level understanding and delves into underlying implications, assumptions, and intended messages. Interpretation requires drawing connections between concepts, analyzing and synthesizing information, and considering the context in which the information is presented. In order to make sense of complex concepts or events, interpretive thinkers engage in thorough

examination and draw upon their prior knowledge, experiences, and cultural perspectives (Paul & Elder, 2006).

To reach a well-informed understanding, they take into account many interpretations, assess the facts, and balance various viewpoints. Interpretation is an active activity that entails critically assessing the nuances, biases, and intended meanings underlying the data or texts under consideration. It is not a passive act. By developing their interpretive abilities, people can more easily explore a variety of information sources, spot hidden meanings, and develop a greater understanding of the subtleties of human communication and expression. Critical thinking requires interpretation, which is an essential skill that encourages intellectual development, creates empathy, and makes it possible for people to interact with information and ideas in more complex and meaningful ways (Paul & Elder, 2006).

2.2.5. Reflection

Reflection entails introspection, self-evaluation, and careful investigation of one's own thoughts, experiences, and actions, is an essential component of critical thinking. It involves taking a step back, analysing one's thought processes, and taking into account any underlying presumptions, prejudices, or constraints that might affect one's point of view. Metacognition is a deliberate process in which reflective thinkers assess their own thought patterns, methods, and results. They evaluate the reasoning's advantages and disadvantages, pinpoint places for development, and make necessary improvements.

Reflection serves as a means for individuals to gain insight into their own cognitive processes, identify potential biases, and challenge preconceived assumptions. Moreover, it facilitates the enhancement of problem-solving techniques, learning from mistakes, and ultimately making more informed decisions. By incorporating reflection as a critical thinking

skill, individuals can cultivate self-awareness, strengthen their reasoning abilities, and develop a deeper understanding of both themselves and the society they inhabit. Reflection acts as a powerful tool that fosters ongoing progress and growth in critical thinking, leading to more effective problem-solving, decision-making, and overall intellectual development (Dewey, 1933).

2.3. Characteristics of Critical Thinkers

Critical thinking is a useful skill that enables people to approach issues, data, and decision-making with consideration and discernment. A unique combination of traits helps critical thinkers handle complex topics, assess the evidence, and reach well-informed conclusions. These people value objectivity, scepticism, open-mindedness, effective communication, a problem-solving approach, intellectual humility, creativity, information literacy, and a contemplative frame of mind. Each of these traits enhances a person's capacity to think critically, challenge presumptions, and draw well-informed judgments, (Ennis, 1989). Additionally, we'll dive deep into these essential qualities and learn how they affect a critical thinker's frame of mind. People can improve their critical thinking skills and approach different elements of life with clarity, rationality, and intellectual rigor by improving these qualities.

2.3.1. Open-Mindedness and Intellectual Curiosity

Fundamental traits of critical thinkers that influence their approach to information and understanding include openness and intellectual curiosity. These people have a sincere desire to learn about new concepts, viewpoints, and data without assumptions or preconceptions. They may take into account different ideas and scenarios when they confront their own convictions since they are open-minded. To deepen their understanding of complex subjects, they actively seek out opposing viewpoints and engage in civil discourse. Intellectual curiosity propels critical

thinkers to ask questions, seek out information, and explore deeper into topics of interest when combined with open-mindedness. They have a natural thirst for knowledge and a drive to broaden their horizons intellectually. Their investigation of many fields is fuelled by intellectual curiosity, which also motivates them to look for fresh information and pursue ongoing personal development. Critical thinkers encourage an attitude of ongoing research, discovery, and intellectual engagement through embracing openness and intellectual curiosity (Paul & Elder, 2006).

2.3.2. Objectivity and fairness

Critical thinkers must possess objectivity and fairness since these qualities direct how they assess data and create opinions. These people make an effort to assess circumstances, issues, and facts objectively, free from bias or emotion. Their ability to be objective allows them to assess material without bias, relying on facts, logic, and reasoning rather than their own opinions or previous views. They are dedicated to unbiased information evaluation, searching out multiple ideas, and taking into account a variety of perspectives before drawing any judgments. Additionally, fairness is something that critical thinkers value in their judgments and interactions. They approach conversations and disputes with a dedication to fair dialogue, giving all pertinent justifications and supporting data equal weight. Fairness implies that they weigh each viewpoint according to its merits rather than favouring one over the other. Critical thinkers uphold objectivity and fairness in order to reach well-founded and logical conclusions, so encouraging intellectual integrity and a balanced and inclusive knowledge of the world around them (Paul & Elder, 2006).

2.3.3. Analytical and Logical reasoning

Critical thinkers must possess analytical abilities and logical reasoning because these abilities are the foundation for their capacity to deconstruct difficult issues and draw well-informed judgments. These people have a high talent for analysing data, spotting trends, and weighing evidence. Their ability to split a scenario or problem into its component parts allows them to fully comprehend the underlying causes at work. Critical thinkers use a planned and methodical technique of reasoning while using a logical approach. They build their conclusions on basic deduction and induction principles that are supported by data and logical consistency. Critical thinkers can evaluate the truthfulness of statements, spot weaknesses in arguments, and create their own well-organized, convincing arguments by applying logical thinking. Their capacity for critical thought and logical reasoning gives them the tools they need to tackle challenging challenges, make well-informed decisions, and successfully negotiate the complexities of the world around them (Halpern, 2003).

2.3.4. Scepticism and Questioning

Critical thinkers are driven by their scepticism and questioning, which are essential traits that guide their search for information and the truth. These people have a healthy scepticism that motivates them to challenge preconceived notions, oppose received wisdom, and critically analyse data. They approach claims critically, looking for supporting facts, logical reasoning, and proof rather than taking them at face value. They are protected from false information by scepticism, which also prevents people from falling for baseless or biased statements. Questioning is a potent technique for supporting intellectual development and knowledge, as critical thinkers are aware of. Additionally, they actively participate in pressing inquiries, obtaining clarifications, and investigating various viewpoints. They are able to probe deeper into

complicated problems and find underlying truths because their inquisitive approach feeds curiosity. Critical thinkers promote an intellectually rigorous society by encouraging scepticism and inquiry, making sure that concepts and data are given careful consideration and review. They question presumptions, reveal misconceptions, and expand knowledge and understanding via their tenacious search for solutions (Sagan, 1995).

2.3.5. Creative and Independent Thinking

Critical thinkers are characterized by creative and independent thinking, which gives them the freedom and originality to approach issues and concepts. These people have the capacity to think creatively, come up with original solutions, and connect seemingly unconnected ideas. They can explore new alternatives and extricate themselves from established patterns by using creative thinking. They encourage original viewpoints and encourage the use of creativity. In addition to valuing individual thought, critical thinkers reject relying only on the views of others. They are confident enough to rely on their knowledge, experiences, and analytical abilities to develop their own conclusions. They can challenge conventional wisdom, cast doubt on established ideas, and investigate alternate points of view thanks to independent thinking. Critical thinkers expand knowledge, encourage innovation, and offer new viewpoints on challenging issues through encouraging creative and independent thought. Their capacity for autonomous thought and creative thinking gives their analyses depth and uniqueness, creating intellectual variety and a culture of learning and discovery (De Bono, 1999).

2.4. Self-Directed Learning and Critical Thinking: A Synergistic Relationship

The beneficial nature of SDL and critical thinking demonstrates the synergy between both. Self-directed learning gives students the power to take control of their educational experience by allowing them to define their own objectives and find their own resources. Critical

thinking abilities improve this process by giving students the capacity to assess data, choose reputable sources of information, and make defensible conclusions. Critical thinking enables learners to separate truth from opinion, assess the evidence, and get a deeper comprehension of the subject matter as they engage in self-directed learning. In contrast, self-directed learning fosters critical thinking abilities by encouraging students to pose questions, consider many viewpoints, and evaluate their own reasoning. The reciprocal relationship between critical thinking and self-directed learning improves learning by encouraging independent thought and encouraging a deeper level of engagement with the subject matter (Smith, 2019; Johnson, 2020).

2.4.1. Previous Studies on the Impact of Self-Directed Learning on Critical Thinking

SDL has garnered significant attention in the field of education over the years. Recognizing that every learner is unique, educators have explored various strategies to personalize instruction according to individual needs. In 1990, researchers John Hiemstra and Barbara Sisco conducted a study titled "Individualizing Instruction: Making Learning Personal, Empowering, and Successful" to investigate the benefits of self-directed learning and its relationship with critical thinking in personalized instructional settings. This research delves into the main points of their study and highlights the importance of self-directed learning in fostering critical thinking skills.

Traditional educational models often adopt a one-size-fits-all approach, treating all students as homogeneous entities. Hiemstra and Sisco (1990) recognized the limitations of traditional instructional approaches in promoting critical thinking and explored alternative methods that actively engage students. They proposed that self-directed learning, which empowers individuals to take control of their own learning, could have a significant impact on the development of critical thinking abilities. To investigate this, they conducted research in real-

world educational settings, working with students in tailored programs that allowed them to set their own pace and choose learning activities. Through surveys, interviews, and observations, the researchers gathered data on students' experiences with self-directed learning and its influence on their critical thinking.

The findings of Hiemstra and Sisco's study(1990) revealed important insights into the relationship between self-directed learning and critical thinking. One key finding was that self-directed learning, by promoting active engagement, enhances critical thinking abilities. When students have the freedom to select activities and explore their interests, they become more motivated and engaged in the learning process. Actively seeking information, evaluating it, and making reasoned judgments fosters increased engagement and facilitates critical thinking. The study also emphasized the value of reflection in self-directed learning. Students who engaged in reflective activities, such as journaling or peer discussions, demonstrated a deeper understanding of course material. Reflection facilitated the integration of new knowledge into existing frameworks, enabling learners to make connections, identify patterns, and sharpen their critical thinking skills. Another significant finding was the role of problem-solving in SDL. By independently overcoming challenges, students acquired problem-solving techniques, which are crucial components of critical thinking. The study showed that when students encountered difficulties, they employed higher-order cognitive processes to solve them. This problem-solving approach not only enhanced their critical thinking skills but also increased their sense of efficacy and confidence in their learning abilities (Hiemstra & Sisco, 1990). Furthermore, another study conducted by Kreber (1998), titled "The relationship between self-directed learning, critical thinking, and psychological type and some implications for teaching in higher education," sought to examine the relationships among psychological type, critical thinking, and self-directed

learning within the context of higher education. Published in *Studies in Higher Education*, the study aimed to explore potential connections between these variables and consider their implications for instructional strategies.

To achieve this, Kreber (1998) employed a mixed-methods approach involving undergraduate students from a Canadian university as participants. The students underwent various tests and assessments based on Carl Jung's theory of personality to measure their levels of self-directed learning, critical thinking abilities, and psychological type. The study's results revealed positive correlations between critical thinking abilities and self-directed learning.

Kuo (2014) investigated the effects of self-directed learning on critical thinking dispositions among undergraduate students. The findings suggested that self-directed learning positively influenced students' critical thinking dispositions, including open-mindedness, analysis, and problem-solving skills. Moreover, (Hung & Cheng, 2018) study explored the relationship between SDL and critical thinking in an online learning environment. The results indicated that SDL positively correlated with critical thinking ability development, suggesting that promoting self-directed learning can enhance students' critical thinking skills.

Conclusion

That we can extrapolate from this chapter are that there is a high correlation between the development of critical thinking skills and self-directed learning. People can take control of their education through self-directed learning by setting goals and actively seeking out information. This proactive approach to teaching fosters the qualities that are essential for critical thinking, such as independence, creativity, and curiosity. Self-directed learning allows students to question assumptions, analyse information from several perspectives, and understand complex ideas. Through this process, the ability to think critically and make sound decisions is developed.

Additionally, critical thinking and self-directed learning complement one another. Self-directed learning promotes critical thinking by encouraging a sense of curiosity, autonomy, and the ability to evaluate and analyse information. Self-directed learners benefit from critical thinking because it gives them the ability to make informed decisions, evaluate their progress, and adapt their learning tactics as needed. This increases their effectiveness and efficiency.

Chapter Two: Research Methodology, Data Analysis, and Discussion

Introduction

Chapter two presents a detailed description of the research methodology conducted in the current study. It is divided into three sections. The research design, population and sampling, research tool, and data collection and analysis are all directly addressed in the first section. In the second section, statistics and quantitative analyses of the students' questionnaire are presented in order to determine the contribution of SDL to critical thinking readiness. Additionally, the results of the questionnaire are displayed. Lastly, the final section discusses the findings in relation to the research questions and hypotheses, followed by the limitations and recommendations of the study.

2.1 Section One: Research Methodology

This section discusses the research design, tools, sample, and population of the selected sample. Furthermore, it provides an explanation of the criteria that were used to select the sample. In addition, it provides a description of the objectives and practices of the data collection instruments.

2.1.1 Research Design and Method

This study follows a non-experimental descriptive design that aims to investigate the contribution of SDL to promote critical thinking among Master 2 English as Foreign Language students at Larbi Tebessi University specializing in language sciences. Descriptive research according to Dulock (1993) is used to “describe systematically and accurately the acts and characteristics of a given population or area of interest” (p. 154). Regression analysis is used in this research study to combine elements of descriptive research and regression analysis. In this

approach, researchers use regression analysis to describe the relationship between variables and provide a quantitative understanding of the subject under study. For this reason, we have chosen to analyze the collected data using a quantitative approach. Based on Aliaga and Gunderson (2000), the quantitative method refers to the gathering and analysis of numerical data by means of mathematical analysis for the purpose of explaining phenomena.

2.1.2 Population and sampling

For this study, our population consisted of Master Two Language Sciences students from the Department of English at Larbi Tébessi University. The population, as defined by Tuff and Tuff (2012), refers to a group of individuals living within a specific community who share the same species. In this case, the population comprised a single group of 38 students enrolled in the academic year 2022/2023. The selection of Master Two students was based on a non-probability purposive sampling procedure. As described by Maxwell (2009), this approach involves intentionally selecting specific settings, individuals, or events because they possess valuable information that cannot be obtained as effectively from other options. The rationale for choosing this population was due to the students' extensive English language studies and their experience with SDL. Moreover, the students showed enthusiasm for participating in the research and were available for inclusion. Given the small number of students in the population, the entire population served as our sample. However, we received responses only from 23 students.

2.1.3. Research Instrument

In this research, a questionnaire was employed as the primary data collection tool. Mathers et al. (1998) defined questionnaires as research instruments used to gather information

about individuals' attitudes, characteristics, and opinions on specific subjects. Questionnaires offer various advantages, including efficiency, as they can yield findings that allow for conclusions to be drawn about the entire population even with relatively small sample sizes. They are also cost-effective for gathering information about people's actions, thoughts, and preferences. Furthermore, questionnaires provide flexibility as they can be combined seamlessly with other methods to gather more comprehensive and diverse data.

For this study, a questionnaire was designed (see Appendix C) and administered to Master Two EFL students. The questionnaire collected demographic information from the participants to investigate their contribution to the study. It aimed to understand participants' strategies for self-directed learning and to address the second research question and its sub-question regarding the overall and most frequent strategies that foster self-directed learning and critical thinking. The questionnaire consisted of 27 closed-ended questions, utilizing a frequency scale for responses. It was divided into three sections.

The first section, "Personal Background," gathered information about the participants' age and gender. The second section, titled "Self-directed section," comprised 15 questions focused on gathering information about participants' self-directed learning strategies. The third section, "Critical Thinking," contained 10 questions and aimed to assess the contribution of self-directed learning strategies to participants' critical thinking abilities. The questionnaire was administered to Master Two EFL students on May 18, 2023. The participants have to choose from the following option:

- a.** Never
- b.** Rarely

- c. Sometimes
- d. Often
- e. Always

2.1.3.1. The Pilot study

The questionnaire was revised by our supervisor, and it was sent to three other teachers, including one who taught the critical thinking module in the Department of English at Larbi Tebessi University. Teachers' feedback helped shape the instrument's development before use in this investigation. The purpose of this step was to review the clarity of the language and the flow of the questions and make any necessary revisions.

2.1.3.2. Reliability of the Questionnaire.

In this study, Cronbach's Alpha Index and statistical analysis tools were used to assess internal reliability. The Cronbach's Alpha coefficient measures the internal consistency of a questionnaire to determine its reliability. Higher reliability index values indicate higher reliability. The reliability index ranges from 0 to 1. In general, a result of 0.7 or higher is satisfactory. The 27 items of this questionnaire have a Cronbach's alpha value of 0.754, which is a positive indicator of reliability and internal consistency.

2.1.4. Data Collection/Analysis Procedures

Google Forms were used to send the questionnaire to students. Since most of the targeted participants were working on their dissertations, it was impossible to locate them at the university. It would be easier for them to complete the questionnaire online and submit it. Questionnaire data collection took three days. A quantitative analysis was conducted on the

collected data. Clarifying and analysing collected data is an inevitable process that must be applied carefully and correctly.

Statistical Package for the Social Sciences (SPSS) was used to analyse the quantitative data collected from the tool, along with regression analysis. Specifically, Miller et al. (2002) stated that SPSS is a software program designed for the purpose of performing statistical operations and aiding in the analysis of data. Social scientists widely recognize it as the most widely used statistical package. The relationship between the variables is quantified using a regression equation, which allows for predicting the value of the dependent variable based on the known value of the independent variable. Additionally, simple regression provides information about the strength and direction of the relationship through the correlation coefficient (r) and the coefficient of determination (R-squared).

2.2. Section Two: Data Analysis

In this section, the data collected from the questionnaire are analysed. The sample of the research was initially composed of 33 students. Nevertheless, only 23 participants collaborated and answered the students' questionnaire, with a response rate of (69.69%) and the results are shown and analysed under the headings below.

Table 1

Number and percentage of participants compared to the sample.

Sample	Respondents	Response rate
33	23	69.69%

2.2.1. *The Analysis of the questionnaire*

Section One: Personal Information

The main purpose of this section was to gather background information about the respondents and verify that the sample included participants of all ages and genders.

1. Age:

Table 2

Age ranges of students.

Age	Number	Percentage
20-24	17	73.91%
25-29	2	8.70%
30-35	2	8.70%
Above 35	2	8.70%

The main purpose of this question was to determine the population's age distribution. Data collected showed that 17 students gave age ranges between 20 and 24 years old, which is 73.91% of the population; 2 students answered 25-29 years old; and the same number of students answered 30-35 and "above 35" options, and statistics showed all their percentages were respectively 8.70%.

2. Gender

This question was designed to determine whether there were both genders among the responders. According to the statistics gathered, the population comprises 18 females (78.26%) and five males (21.74%).

Table 3

Participants' gender

Gender	Number	Percentage
Female	18	78.26%
Male	5	21.74%

Section Two: Self-Directed Learning in EFL classroom

The main objective of this section is to examine the strategies students use to develop their academic skills, self-control, learning motivation, and self-management.

Question 5: This question aims to gauge students' time management skills and determine whether they allow adequate time to finish their assignments and study for exams. The outcomes, on a scale, were as follows: First, 4.35% of respondents said they never spent time studying for exams, followed by 13.04% of students who said they do it infrequently, 36.13% who occasionally study for exams and allow enough time to complete assignments, and 21.74% who frequently spend time managing their time for assignments and exams, while 21.74% of respondents said they always spend their time as efficiently as possible.

Table 4

The respondents' investing time in preparations

Option	Number	Percentage
Never	1	4.35%
Rarely	3	13.04%
Sometimes	9	36.13%
Often	5	21.74%
Always	5	21.74%

Question 6: The main focus of the question is how frequently students search for and gather specific amounts of information they need and use it to advance in their studies. According to the results, 17.39% of students rarely conduct research, 34.78% of students occasionally search for a range of information they need to gather, 30.43% frequently search for information, and 34.78% of students look to find a specific set of classmates.

Table 5

The students search for a range of materials.

Options	Numbers	Percentage
Never	0	0%
Rarely	4	17.39%
Sometimes	8	34.78%
Often	7	30.43%
Never	4	17.47%

Question 7: This question is related to whether the students frequently follow their teachers' explanations without any doubts about the reliability of the teacher's information or if

the students ask about their accuracy. It was found that 21.74% of students trust their teachers' sources and never question the accuracy of their information, compared to 13.04% who rarely ask for the information provided by their teachers, 26.09% who occasionally inquire about the sources of the data provided by teachers, and additionally, 34.78% who frequently doubt about the veracity of the information they have received, whereas 4.35% said they always do.

Table 6

Students follow teachers' explanations.

Option	Number	Percentage
Never	5	21.74%
Rarely	3	13.04%
Sometimes	6	26.09%
Often	8	34.78%
Always	1	4.35%

Question 8: The main reason for asking this question is to determine whether the general population already desires to learn and whether they are making any efforts to find the knowledge they seek. None of the students who responded never or rarely indicated this; nonetheless, 26.09% of them occasionally expressed a desire to understand more details about specific subjects, as opposed to 30.43% of participants. Additionally, it was shown that 43.48% of students consistently endeavour to fulfil their requirements and constantly desire to study.

Table 7:

Students desire to learn.

Option	Number	Percentage
Never	0	0%
Rarely	0	0%
Sometimes	6	26.09%
Often	7	30.43%
Always	10	43.48%

Question 9: This inquiry is intended to test that assumption to determine if the students are self-reliant learners and advance in their studies solely on their own; the results were highlighted as 0% of students selected "never" or "rarely" as an answer, indicating that everyone frequently relies on themselves to gather enough information, 13.04% of students said they occasionally turn to themselves for answers to questions they encounter while learning, and 34.78% said they frequently do so. Meanwhile, according to the statistics, 52.17% of students reported being entirely self-reliant in their learning.

Table 8:

Students and self-reliant learning style.

Option	Number	Percentage
Never	0	0%
Rarely	0	0%
Sometimes	3	13.04%
Often	8	34.78%
Always	12	52.17%

Question 10: This question was mainly asked to determine if the students were thinking about what they had learned throughout the lesson and if they were analysing the material they had been given. According to the survey, 4.35% of respondents said they never thought about what they had learned in class, 8.70% of students said they rarely thought about what they had been given, 30.43% said they occasionally thought about what they had learned and analysed it, and 39.13% said they frequently thought about and reflected on what they had learned. 17.39% of respondents also claimed to be thoughtful and analytical in class.

Table 9

Participants reflecting on and analysing the information received during the session

Option	Number	Percentage	
Never	1	4.35%	
Rarely	2	8.70%	Questi
Sometimes	7	30.43%	on 11:
Often	9	39.13%	As
Always	4	17.39%	shown
			in

Table 8, the findings showed that 4.35% of students never ask for guidance, 13.04% said they rarely approach other professors for criticism, and the majority, 52.17%, said they occasionally use teachers' advice to look for areas where they may develop. Finally, 4.35% of students indicated that they always seek to improve their work by seeking feedback, joining 26.09% of respondents who said they frequently strive to do so.

Table 10*Students seeking feedback from teachers*

Option	Number	Percentage
Never	1	4.35%
Rarely	3	13.04%
Sometimes	12	52.17%
Often	6	26.09
Always	1	4.35%

Question 12: This question was designed to determine whether students recognize the need to take notes, as well as how frequently they do it. Again, the findings showed that no respondents selected "never" or "rarely" as a response, demonstrating that the majority of people are already aware of the value of taking notes. However, 21.74% of students said they frequently take notes, compared to 13.04% of participants who said they do it occasionally. Most of them (65.22%) also stated that they frequently take notes and know their significance.

Table 11*Students take notes regularly.*

Option	Number	Percentage
Never	0	0%
Rarely	0	0%
Sometimes	3	13.04%

Often	5	21.74%
Always	15	65.22%

Question 13: This question seeks to determine whether students regularly look up additional subjects they are curious to learn about and interested in learning more about or whether they exclusively look up and learn about subjects prescribed by the curriculum. The results showed that 0% of the students selected "never," while 21.74% answered they "rarely" look for topics they find interesting, and 39.13% said they "occasionally" look for topics they find interesting. However, 21.74% indicated they "often" try to explore new subjects, and 17.39% reported they "always" look for new topics outside of the curriculum.

Table 12

Students search for topics they are interested in.

Option	Number	Percentage
Never	0	0%
Rarely	5	21.74%
Sometimes	9	39.13%
Often	5	21.74%
Always	4	17.39%

Question 14: With the help of this question, determine whether students have previously set their own goals and assessed their performance in light of those goals. Again, 0% of students selected "never" as their answer; however, the statistical results showed that 17.39%

of the population rarely sets their own goals, while 26.09% of them organize their successes occasionally to gauge their performance. Additionally, 30.43% of respondents said they set their own goals frequently; however, students who responded they evaluated their work based on their pre-set goals were described as 26.09%.

Table 13:

Students set their standards to rate their performances.

Option	Number	Percentage
Never	0	0%
Rarely	4	17.39%
Sometimes	6	26.09%
Often	7	30.43%
Always	6	26.09%

Question 15: The purpose of this question is to determine whether the students are aware of their learning capacity and the process they should use to advance their learning. The results indicated that none of the students selected to respond "never" or "rarely." While 47.83% are aware of their deficiencies, 26.09% of students indicated they are always mindful of their limitations. In contrast, 26.09% of them are occasionally aware of their skills.

Table 14:

Students are aware of their limitations.

Option	Number	Percentage
--------	--------	------------

Never	0	0%
Rarely	0	0%
Sometimes	6	26.09%
Often	11	47.83%
Always	6	26.09%

Question 16: This question is mainly intended to determine students' capacities for self-evaluation and how well they can research their talents. The results show that 0% of participants chose never, but that 4.35% of students said they rarely evaluated their performance, and 30.43% said they occasionally did. 43.48% of students reported that they often assess their performance and learning capabilities. Additionally, it was found that 21.74% of students constantly review their work to find ways to enhance it.

Table 15

Students examine their abilities.

Option	Number	Percentage
Never	0	0%
Rarely	1	4.35%
Sometimes	7	30.43%
Often	10	43.48%
Always	5	21.74%

Question 17: This question looked at our population's problem-solving skills and whether they had thought ahead about how to deal with challenges that might arise over the course of learning. The data revealed that while 0% of respondents chose "never," only 30.43% set plans to address their learning issues; 8.70% said they occasionally relied on the plans they had previously made to address their learning issues; 26.09% said they frequently pre-arrange to address issues; and 34.78% claimed they always solved their problems based on their plans.

Table 16

Participants set plans in advance to solve learning problems.

Option	Number	Percentage
Never	0	0%
Rarely	7	30.43%
Sometimes	2	8.70%
Often	6	26.09%
Always	8	34.78%

Question 18: By setting time restrictions for themselves to work within and complete their responsibilities, we can assess how well students manage their time throughout this question. According to the data gathered, the "never" option was not chosen with a percentage of 0%; however, 17.39% of respondents stated that they rarely work within their own designed deadlines, while 21.74% said that sometimes they set specific work frames for themselves to ensure they complete their assessment and 34.78% of them frequently do so. Last but not least, 26.09% of the students said they always establish work boundaries.

Table 17*Students set their deadlines.*

Option	Number	Percentage
Never	0	0%
Rarely	4	17.39%
Sometimes	5	21.74%
Often	8	34.79%
Always	6	26.09%

Question 19: This question seeks to ascertain whether students have a positive or negative perspective on the errors they make while studying. Once more, the findings showed that the participant's responses to the negative options—"never" and "rarely," with a proportion of 0% for each—were unfavourable. On the other hand, 13.04% of students were said to view their blunders as lessons occasionally. Additionally, 26.09% of them said they often learn from their mistakes. However, most respondents (60.87%) stated that they always reflect positively on the mistakes they make when learning.

Table 18*Learners consider their mistakes as lessons*

Option	Number	Percentage
Never	0	0%
Rarely	0	0%

Sometimes	3	13.04%
Often	6	26.09
Always	14	60.87%

Section Three: Critical Thinking

This section examines the participants' critical thinking abilities and the strategies they use to improve them.

Question 21: This question is to ascertain whether or not the students are working to hone their problem-solving skills through practice. The results show that 0% of participants chose "never," 4.35% chose "rarely try to improve my problem-solving skills," and 39.13% chose "occasionally work on my problem-solving skills." Statistics also revealed that 34.78% of students claimed they often practice and evaluate their problem-solving abilities. The data collected also showed that 21.74% of students practice and improve their problem-solving skills regularly.

Table 19

Students trying to work on their problem-solving skills and evaluate them

Option	Number	Percentage
Never	0	0%
Rarely	1	4.35%
Sometimes	9	39.13%

Often	8	34.78%
Always	5	21.74%

Question 22: This question focused on how frequently students consider reasonable proof to support their ideas before engaging in any argument. The findings showed that 0% of respondents believed "never" were an appropriate choice, while 8.70% rarely provided substantial evidence to support their beliefs. The exact number of students stated that they sometimes think about ideas to support their assumptions before expressing them. A total of 56.52% of participants claimed they frequently consider compelling evidence before expressing their opinions, while 26.09% said they always have their evidence prepared before getting into a discussion.

Table 20

Students prepare evidence before engaging in any topic.

Option	Number	Percentage
Never	0	0%
Rarely	2	8.70%
Sometimes	2	8.70%
Often	13	56.52%
Always	6	26.09%

Question 23: The objective of asking this question was to learn more about how well-informed and quick-thinking students were at making decisions. The data showed that none

of the participants believed "never" was the right response; however, 17.39% of them asserted they rarely try to make decisions quickly, and 26.09% of the population gave the same response. The majority of students said they often make quick and precise decisions, with a percentage of 39.13%. Additionally, 17.39% indicated they can always make wise decisions in a hurry.

Table 21

Students are trying to make quick and accurate decisions.

Option	Number	Percentage
Never	0	0%
Rarely	4	17.39%
Sometimes	6	26.09%
Often	9	39.13%
Always	4	17.39%

Question 24: This question was designed to gauge how well the students appropriately communicate their ideas and points of view, deliver a clear message without using ambiguous language, and express their ideas in context. Following the data acquired, we discovered that 0% of the population responded "never," while 13.04% said they find it challenging to communicate their opinions clearly. Additionally, it was noted that while 43.48% of students can frequently find a practical approach to express their viewpoints, only 21.74% of students can always do so. Finally, 21.74% of respondents can understandably communicate their ideas.

Table 22

The students express their opinions in an understandable way

Option	Number	Percentage
Never	0	0%
Rarely	3	13.04%
Sometimes	5	21.74
Often	10	43.48
Always	5	21.74

Question 25: This question investigates how and whether students evaluate one another's points of view before passing judgment. Again, based on the data collected, 0% of students selected the "never" option. Contrarily, 21.74% infrequently consider opposing viewpoints. In addition, 34.78% of participants said they occasionally believe other points of view. In contrast, 17.39% of them claimed to frequently weigh other pupils' opinions before expressing their own. Not to mention, 26.09% of participants said they always respect other people's views.

Table 23

Students take the other perspectives into account before they make a judgment.

Option	Number	Percentage
Never	0	0%
Rarely	5	21.74%
Sometimes	8	34.78%
Often	4	17.39%

Always 6 26.09%

Question 26: The major goal of this question is to determine whether the students can make a well-considered decision by connecting all the relevant information they have gathered and drawing a conclusion. According to the statistics gathered, 0% of the students selected "never" as an answer. However, 21.74% rarely reach valid conclusions. While 26.09% of respondents claimed they sometimes utilize the information they've already learned to build a logical conclusion, the majority of them (34.78) said they frequently make well-thought-out decisions. Furthermore, 13.39% of students can always base their decisions on factual findings.

Table 24

Learners with the ability to draw conclusions and make informed judgments.

Option	Number	Percentage
Never	0	0%
Rarely	5	21.74%
Sometimes	6	26.09%
Often	8	34.78%
Always	4	13.39%

Question 27: This question aims to determine whether or not students make an effort to analyse new information they are exposed to critically. Again, 0% of the population selected "never" as their unfavourable answer. However, 13.04% of them hardly ever recognize the ridiculous reasons they encounter. Additionally, 26.09% of students can occasionally spot a

contradiction between a given claim and logic. While most students (47.83%) claimed they could critically evaluate the material they were provided frequently, just 13.04% claimed they could always identify mistakes by applying logical reasoning to a specific concept.

Table 25

Students with the ability to identify the gap between logic and a given opinion.

Option	Number	Percentage
Never	0	0%
Rarely	3	13.04%
Sometimes	6	26.09%
Often	11	47.83%
Always	3	13.04%

Question 28: The question aims to comprehend students' self-confidence and how frequently they trust their judgment when encountering new learning problems. Data gathering revealed that 0% of respondents indicated that they would "never" use it. However, 4.35% of students indicated they hardly ever trust their thoughts. However, 30.43% occasionally have enough confidence in their concepts to think they can address a specific issue. However, 60.87% of participants say they are self-assured about their convictions on a particular subject. Last but not least, 4.35% of respondents constantly trust their judgment.

Table 26

Students who trust their thoughts when they come across a new idea

Option	Number	Percentage
Never	0	0%
Rarely	1	4.35%
Sometimes	7	30.43%
Often	14	60.87%
Always	1	4.35%

Question 29: The purpose of this inquiry is to find out how frequently students solve difficulties and how well they can assess their arguments. Furthermore, 0% of students chose "never" as their answer. The same amount of people also responded "rarely" to the question. However, 34.78% of them acknowledged that they occasionally assess and rank the reasons for an issue they are experiencing. The majority (60.87%) responded that they could frequently assess their inferences to summarize a specific problem. In addition, 4.35% of students said they could consistently evaluate the arguments they were relying on to conclude.

Table 27

Students who are capable of evaluating their conclusions concerning an issue they are facing.

Option	Number	Percentage
Never	0	0%
Rarely	0	0%
Sometimes	8	34.78%
Often	14	60.87%
Always	1	4.35%

Question 30: The main idea to tackle throughout this question was whether the students could identify problems within the context and provide clarification about them. The

statistics gathered showed that 0% of the population chose "never" and "rarely" as acceptable answers. However, 21.74% of participants said they could occasionally describe a problem. While 56.52 percent can frequently identify the issue and give reasons for it. Last but not least, statistical data showed that 21.74% of respondents could consistently identify and define their concerns.

Table 28

Students with the ability to explain and characterize learning problems.

Option	Number	Percentage
Never	0	0%
Rarely	0	0%
Sometimes	5	21.74%
Often	13	56.52%
Always	5	21.74%

2.2.2. The Contribution of SDL To Critical Thinking

The second question inquired whether SDL could be a contributor to critical learning. To answer that question linear simple regression analysis was performed in the data. The following the Table showed the contribution of SDL (dependent variable) to critical thinking (independent variables/predictors). Significant regression equation was presented in the following table:

Table

Linear Regression to Predict the Contribution of SDL to critical thinking

	Model	Unstandardized coefficients		standardized coefficients	t	Sig.	R Square
		B	Std. Error	Beta			
Critical Thinking	Constant	1.214	.395		3.077	.006	.425
	SDL	.569	.144	.652	3.938	.001	R=.652

652

We note from the table that a simple linear regression equation for the contribution of SDL on the critical thinking represented in the coefficient of determination R² has reached its value of 0.425 and that the estimated percentage of 42.5 % of the effect on the SDL is due to other factors, and the correlation coefficient reached R = .0652 for critical thinking which indicates the existence of a relationship between the two variables. The value coefficient of the SDL B .569, with a significance level of 0.001, is not significant because it is greater than the significance level, which indicates the positive relationship between the SDL and critical thinking statistically. As for the parameter (constant term), its value was B=1.214 with a function level of 0.006. The t-value of 3.077 for the constant term indicates that the constant is statistically significant at the 0.05 level (p-value = 0.006), suggesting that it contributes significantly to the model.

Overall, these results suggest that there is a statistically significant and positive relationship between SDL and Critical Thinking. The model accounts for approximately 42.5% of the variance in Critical Thinking, with SDL being a significant predictor. However, it is important to note that additional factors not included in the model may also contribute to Critical Thinking.

2.3. Section Three: Discussion of the Results

The collected questionnaire data from the Master's Two Language Sciences students in the English language department will be analysed in relation to the research questions and previous studies on SDL. The aim is to explore how experienced learners in this program utilize SDL techniques and investigate their potential influence on students' critical thinking abilities.

The Data gathered from the students' questionnaire supports the answer to the first research question, which investigates the overall strategies used to develop SDL and CT, by using a certain set of strategies implemented within the questions of the questionnaire and starting with the second section that deals with SDL. The strategies used in this section were setting goals, which determine the information they want to learn and why it matters to them, and according to the findings, the majority of students showed a positive review of this strategy. Additionally, time management involves planning and managing how much time is spent on various activities, and once again, the students responded positively to this strategy. The next strategy is to clarify facts, assess data, and raise doubts about presumptions by asking questions. This strategy was also chosen by respondents as one of the methods used. Moving further, we have creating plans," which refers to setting a plan for how they will accomplish their objectives, including a list of resources and timeframes with which the student's showed collaboration.

Furthermore, seeking feedback that deals with getting information from others on your progress and modifying your plan as necessary, and once again, the students responded positively to this strategy. In addition to that, reflecting on your own learning once again was another strategy that participants stated they use by considering what they have learned, what has worked well, and what they could do better in order to improve their SDL. Another strategy used, according to the data, was being flexible, which means showing interest in using many methods in order to progress. Additionally, being self-motivated is another strategy used by the

majority of the population to keep themselves inspired by concentrating on the advantages of learning and acknowledging their accomplishments along the way. Last but not least, the final strategy implemented in the questionnaire is being self-reliant, which refers to a person's capacity to use their own resources and skills to meet their demands and find solutions, and once again, students stated that this is a favourable method that they use.

The literature review highlights the significance of SDL and the strategies commonly employed to develop it. Goal setting, time management, information seeking, reflection, and collaborative learning emerged as key strategies in fostering SDL. Understanding and implementing these strategies can empower learners to become self-directed, motivated, and lifelong learners, capable of adapting to changing educational landscapes. For example, Candy (1991) focused on the concept of self-direction in learning and identified four critical processes: diagnosing learning needs, formulating learning goals, identifying and utilizing resources, and evaluating learning outcomes. He emphasized the importance of these processes in promoting effective self-directed learning. Tough (2012) conducted extensive research on self-directed learning and identified a set of strategies employed by successful self-directed learners. These strategies include setting goals, seeking and using resources, engaging in planning and organizing, and evaluating and reflecting on learning experiences. which year

Meanwhile, six other strategies were implemented in the third section of the questionnaire, which deals with critical thinking. First of all, we have analysing information, which means breaking up complex material into manageable pieces and then evaluating each piece separately. This was chosen by many students as a reliable strategy. Another strategy used among the students was evaluating arguments, which refers to examining the advantages and disadvantages of various positions and taking other viewpoints into account. Identifying biases

was also a method used by respondents, which refers to being aware of your own and other people's biases and thinking about how they could affect your thinking. Additionally, generating alternatives is one of the strategies used to consider multiple solutions from different perspectives, and our population positively responded to this method. Whereas many participants stated they use seeking evidence as a reliable method throughout different questions, this particular method is used to search for proof to support or disprove assertions and assess the reliability of various sources.

Finally, the last strategy used in the second section's statements is making connections, which means seeking out any patterns or connections between different elements and taking into account how they relate to the overall picture. We can conclude from the results that the majority of M2 students use all of the strategies listed in the questionnaire for a number of reasons, including the targeted population's maturity and the fact that they have already taken CT as a module. M2 students also gained a lot of experience during their time at university. It is important to note that these M2 have experienced the COVID-19 pandemic and have been exposed to various techniques as a result of the lockdown.

According to the first sub-question, which investigates the most frequently employed strategies for M2 students to develop self-directed learning (SDL), the data collected from the second section of the questionnaire highlights the following strategies as the most utilized. Being self-motivated, as indicated in statements 8 and 19, received the highest average. The vast majority of students reported always being motivated, either by their intrinsic desire to learn or by learning from their mistakes. Being self-reliant, as stated in statements 9 and 16, was favored by a significant majority of participants. This strategy emphasizes students' reliance on themselves to progress in their studies and their ability to evaluate their own performance.

Creating plans emerged as another frequently used strategy, reflected in statements 17 and 18. Many participants engage in pre-planning to anticipate and solve potential learning obstacles, setting their own deadlines to work within specific timeframes. Setting goals was also a popular choice among the population, as observed in statement 14. The majority of students indicated that they frequently establish their own goals to assess their progress and achievements.

Overall, these findings highlight the prominent strategies employed by M2 students to enhance their SDL experience. However, the second sub-question focuses on the most commonly employed strategies by M2 students to develop critical thinking (CT). The data obtained from the third section of the students' questionnaire, which specifically addresses CT, reveals four primary strategies frequently utilized by M2 students. Firstly, the strategy of analysing information was identified as the main approach, as indicated by responses to statements 24 and 30. The majority of participants reported their ability to consistently identify and characterize problems while expressing their thoughts clearly. Secondly, evaluating arguments emerged as another favored strategy, as evidenced by responses to statements 22 and 23. Students often engage in examining and providing solid evidence before entering into any debate, demonstrating their capacity to make prompt and accurate decisions. Additionally, the strategy of identifying biases, reflected in statements 27 and 28, received positive feedback from the majority of students. They reported their ability to recognize discrepancies between logical reasoning and given ideas, demonstrating confidence in their judgment of new concepts. Lastly, generating alternatives was identified as another commonly employed strategy, as mentioned in statement 25. Many students acknowledged their frequent consideration of alternative perspectives prior to forming judgments.

Several authors have made significant contributions to the understanding and development of critical thinking skills. Exploring their works can provide valuable insights into the main strategies for fostering critical thinking in educational settings. Nosich (2010) has emphasized the importance of questioning and exploring multiple perspectives as key strategies for developing critical thinking. Nosich (2010) also advocates for teaching students to recognize and evaluate assumptions, as well as to make informed judgments based on evidence. Facione (2010) is a prominent author in the field of critical thinking and has contributed significantly to the development of critical thinking assessment tools. He has outlined several strategies for developing critical thinking, including clarifying and questioning assumptions, analyzing and evaluating arguments, and solving problems systematically.

2.3.2. Results of Regression Study

According to the regression study that was conducted over the results of the questionnaire to answer our second research question that invisible the contribution of SDL on CT and after applying Spearman coefficient to calculate the data collected from both variables, we found that the relationship between the two variables showed a positive contribution of SDL variable to CT variable ($R=0.652$). Hence, the analysis yields a p-value that is smaller than the predetermined significance level (usually 0.05), its lead to "reject the null hypothesis." and suggests that there is enough evidence to support the alternative hypothesis and conclude that there is a significant difference or relationship between the variables being tested. Many studies provide empirical evidence supporting the notion that there is a significant and positive relationship between SDL and critical thinking. They highlight the importance of fostering SDL practices to enhance students' critical thinking skills. However, it is important to note that

individual study designs and contexts may vary, and further research is needed to explore this relationship in different educational settings and populations.

Zhang and Chen (2020) conducted a study with undergraduate students to explore the relationship between SDL and critical thinking. Their findings indicated a positive and significant correlation between SDL and critical thinking abilities. The study concluded that self-directed learners tend to exhibit higher levels of critical thinking skills. Moreover, Gumus and Asiksoy (2016) conducted a study to investigate the relationship between SDL and critical thinking in the context of online learning. Their findings indicated a significant positive correlation between SDL and critical thinking skills. The study suggested that SDL promotes higher-order thinking processes and enhances critical thinking abilities.

Tseng and Shih (2013) examined the impact of SDL on critical thinking skills among nursing students. Their study found a significant positive relationship between SDL and critical thinking. The results suggested that self-directed learners are more likely to demonstrate effective critical thinking abilities, which are essential for clinical decision-making and problem-solving in the healthcare field. Johnston and Fitzpatrick (2010) investigated the relationship between SDL and critical thinking among adult learners in a distance education setting. Their study revealed a significant positive correlation between SDL and critical thinking skills. The findings suggested that self-directed learners exhibit higher levels of critical thinking, enabling them to engage more deeply with the course content and apply their knowledge effectively.

2.3.3. Summary of the Results

The study concludes with several significant findings that align with our initial assumptions and address the research questions we posed. Based on the results, we can confidently state that both

assumptions have been confirmed. The majority of participants in our sample responded positively to all the strategies presented in the questionnaire, which supports our first assumption which demonstrate that M2 students follow certain strategies of SDL in order to improve their CT due to their maturity and the experience they gained throughout the academic years the spent at university. Additionally, the results of the regression analysis, along with previous studies, demonstrate the potential influence of (SDL) on critical thinking which also lead us to accept the alternative hypothesis indicating that SDL contribute to critical thinking due to the practices that M2 students perform to improve their performances.

2.3.4. Recommendations of the study

Here are some recommendations for teachers to foster the development of self-directed (SDL) and (CT) skills in students:

- 1.** Create a learner-centred environment: Design instructional activities that encourage students to take ownership of their learning process. Provide opportunities for students to set their own goals, make choices, and take responsibility for their learning outcomes.
- 2.** Promote active learning: Engage students in hands-on activities, discussions, and problem-solving tasks that require critical thinking. Encourage them to ask questions, analyze information, and evaluate different perspectives.
- 3.** Encourage self-reflection: Incorporate reflection activities into the learning process, such as journaling, group discussions, or self-assessment exercises. Encourage students to reflect on their learning experiences, identify areas for improvement, and set new goals.
- 4.** Provide guidance and support: Offer guidance and support to students as they navigate the self-directed learning process. Help them develop effective study skills, time management techniques, and information evaluation strategies.

5. Incorporate real-world applications: Connect classroom learning to real-world scenarios and contexts. Provide opportunities for students to apply their knowledge and critical thinking skills to solve authentic problems or analyze real-life situations.
6. Foster collaborative learning: Encourage collaboration and peer-to-peer interactions among students. Group work and collaborative projects can enhance critical thinking skills as students learn from and challenge one another's perspectives.
7. Offer feedback and assessment: Provide timely and constructive feedback to students on their progress. Assessments should go beyond rote memorization and focus on evaluating students' critical thinking abilities and their ability to apply SDL strategies effectively.
8. Model critical thinking: Demonstrate critical thinking skills and processes through your own teaching practices. Encourage open dialogue, questioning, and exploration of different viewpoints.

2.3.5. Limitations of the study

While the study provides valuable insights into the contribution of (SDL) to (CT), it is important to acknowledge certain limitations that may impact the generalizability of the findings. Some limitations include:

1. Sample size and representativeness: The study may have relied on a relatively small sample size or a specific population, such as a particular educational institution or program. This may limit the generalizability of the findings to a broader population of learners.
2. Self-report bias: The data collected through questionnaires or self-report measures may be subject to respondent bias. Participants may provide socially desirable responses or overestimate their engagement in SDL activities, which can affect the accuracy of the findings.

3. Single-method approach: The study might have solely relied on a single research method, such as questionnaires, to collect data on SDL and CT. Incorporating multiple data collection methods, such as interviews or observations, could provide a more comprehensive understanding of the relationship between SDL and CT.

4. Causality and directionality: The study's design may not establish a causal relationship or the direction of influence between SDL and CT. It is possible that other factors or variables not accounted for in the study could influence the relationship between SDL and CT.

5. Timeframe and long-term effects: The study's timeframe might have been limited, focusing on short-term effects rather than long-term outcomes. It is important to consider the potential lasting effects of SDL on CT and how they may evolve over time.

6. Assessing critical thinking is a complex task and may involve subjective judgment or reliance on self-report measures. Different researchers may use different tools or methodologies to measure critical thinking, which can introduce variability and affect the reliability of the findings.

7. Establishing a direct cause-and-effect relationship between self-directed learning strategies and improvements in critical thinking can be challenging. Other factors, such as prior knowledge, motivation, or external influences, may also impact critical thinking skills, making it difficult to attribute changes solely to self-directed learning strategies.

2.3.6. Future Research Directions

To avoid any possible difficulties during research here are some suggestions for future studies.

1. Incorporate qualitative methods, such as interviews or focus groups, to gain deeper insights into participants' experiences with self-directed learning strategies. Explore their perceptions, challenges faced, strategies employed, and how they believe the strategies influenced their critical thinking abilities.
2. Ensure the inclusion of participants from diverse backgrounds, such as different age groups, educational levels, and cultural or socio-economic backgrounds. This will help broaden the generalizability of the findings and provide insights into the effectiveness of self-directed learning strategies across various populations.
3. Establishing a direct cause-and-effect relationship between self-directed learning strategies and improvements in critical thinking can be challenging. Other factors, such as prior knowledge, motivation, or external influences, may also impact critical thinking skills, making it difficult to attribute changes solely to self-directed learning strategies.
4. Employ a mixed-methods research design that combines quantitative and qualitative data collection and analysis techniques. This can provide a more comprehensive view of the impact of self-directed learning strategies on critical thinking, allowing for a deeper exploration of participants' experiences and perceptions.
5. Conduct a longitudinal study to examine the long-term effects of self-directed learning strategies on critical thinking. Track participants' progress over an extended period, allowing for a more robust assessment of the sustained impact of these strategies.

Conclusion

This chapter provides a comprehensive overview of the research strategy, data analysis, discussion, and findings. It includes a detailed examination of the survey data and regression

study, revealing the strategies employed by M2 students to improve their (SDL) and CT, as well as the potential impact of SDL on CT. Additionally, the chapter discusses the limitations of the study and offers recommendations for future research.

General Conclusion

In summary, (SDL) is an essential skill in today's fast-paced world, empowering individuals to take control of their education and personal growth by determining what and how they learn. Additionally, critical thinking plays a crucial role in decision-making and problem-solving, enabling individuals to discern biases, fallacies, and the distinction between fact and opinion.

This study comprises two chapters, each focusing on different aspects of the research topic. The first chapter delves into an extensive literature review, exploring the definition and significance of self-directed learning in education, key principles, theories, and models of SDL, as well as the characteristics associated with it. Additionally, the second section provides insights into the definition and importance of critical thinking, its components, and its role within the English as a Foreign Language (EFL) context. The chapter highlights the synergistic relationship between SDL and CT, supported by previous studies on the impact of SDL on critical thinking.

Moving to the second chapter, it provides a comprehensive explanation of the research methodology employed throughout the study, including data collection methods, data analysis techniques, and the interpretation of results. The chapter concludes by presenting recommendations for further research while acknowledging the limitations of the current study. The analysis of data gathered from a questionnaire administered to Master's second-year students in the Language Sciences program at the English department of Echahid Cheikh Larbi Tebessi University, along with the regression study based on their questionnaire responses, contribute to addressing the research questions and assumptions.

The core focus of this investigation lies in the analysis and interpretation of the collected data. The research findings indicate that the surveyed population is already employing strategies to enhance their self-directed learning and critical thinking skills. Moreover, the data results reveal the most favoured strategies employed by Master's second-year students. Furthermore, statistical evidence strengthens the link between self-directed learning and critical thinking, affirming their interdependence.

Overall, this study sheds light on the importance of SDL and CT, provides valuable insights into the strategies employed by students, and offers statistical evidence to support the relationship between these two constructs.

References

- Abrami, P. C., Bernard, R. M., Borokhovski, E., Wade, A., Surkes, M. A., Tamim, R. M., & Zhang, D. (2008). Instructional Interventions Affecting Critical Thinking Skills and Dispositions: A Stage 1 Meta-Analysis. *Review of Educational Research*, 78(4), 1102–1134. <https://doi.org/10.3102/0034654308326084>
- Ackerman, C. E., MA. (2023). Self Determination Theory and How It Explains Motivation. *PositivePsychology.com*. <https://positivepsychology.com/self-determination-theory/>
- Aliaga, M., & Gunderson, B. (2000). *Interactive statistics*. Saddle River.
- Alshoaibi, M. (2018). Social Media and Its Impact on Arab Youth Identity. *Review of European Studies*, 11(1), 1. <https://doi.org/10.5539/res.v11n1p1>
- Andrade, H. L., & Du, Y. (2005). Student responses to criteria-referenced self-assessment. *Assessment & Evaluation in Higher Education*, 30(6), 591-607.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1-26.
- Boekaerts, M. (1997). Self-regulated learning: A new concept embraced by researchers, policy makers, educators, teachers, and students. *Learning and Instruction*, 7(2), 161–186. [https://doi.org/10.1016/s0959-4752\(96\)00015-1](https://doi.org/10.1016/s0959-4752(96)00015-1)
- Boud, D., Keogh, R., & Walker, D. (1985). *Promoting reflection in learning: A Mmodel*. *Reflection: Turning reflection into learning*. London: Routledge.
- Brookfield, S. D. (2011). *Teaching for critical thinking: Tools and techniques to help students question their assumptions*. Jossey-Bass.

- Brookfield, S. D. (2012). *Teaching for critical thinking: Tools and techniques to help students question their assumptions*. San Francisco, CA : Jossey Bass
- Brown, A. L. (1987). Metacognition, Executive Control, Self-Regulation, and Other More Mysterious Mechanisms. In F. E. Weinert, & R. Kluwe (Eds.), *Metacognition, Motivation, and Understanding* (pp. 65-116). Hillsdale: L. Erlbaum Associates.
- Candy, P. C. (1991). *Self-Direction for lifelong learning: A comprehensive guide to theory and practice*. Jossey-Bass.
- Chen, J., Latham, G. P., & Sadri, G. (2015). Time management and the self-regulation of learning and performance. *Academy of Management Perspectives*, 29(3), 359-372.
- Csikszentmihalyi, M. (1990). Flow: The Psychology of Optimal Experience. *ResearchGate*.
https://www.researchgate.net/publication/224927532_Flow_The_Psychology_of_Optimal_Experience
- De Bono, E. (1999). *Six thinking hats*. Penguin Books.
- Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. *Perspectives in Social Psychology*, 1(3), 371-382.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268.
- Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process*. D.C. Heath and Company.
- Dewey, J. (1933). *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process*. Houghton Mifflin.

- Dillenbourg, P. (1999). What do you mean by collaborative learning? In *HAL (Le Centre pour la Communication Scientifique Directe)*. French National Centre for Scientific Research.
<https://telearn.archives-ouvertes.fr/hal-00190240>
- Dulock, H. L. (1993). Research Design: Descriptive Research. *Journal of Pediatric Oncology Nursing, 10*(4), 154–157. <https://doi.org/10.1177/104345429301000406>
- Efklides, A. (2006). Metacognition and affect: What can metacognitive experiences tell us about the learning process? *Educational Research Review, 1*(1), 3–14.
<https://doi.org/10.1016/j.edurev.2005.11.001>
- Elder, L., & Paul, R. (2006). Critical Thinking: The Nature of Critical and Creative Thought. *Journal of Developmental Education, 30*(2), 34-35.
- Elias, J. L., & Merriam, S. B. (1995). *Philosophical Foundations of Adult Education*.
- Ennis, R. H. (1962). A Concept of Critical Thinking. *Harvard Educational Review, 32*(1), 81–111.
- Ennis, R. H. (1987). A taxonomy of critical thinking dispositions and abilities. *Teaching Thinking Skills: Theory and Practice, 9–26*. <https://ci.nii.ac.jp/naid/10025989370>
- Ennis, R. H. (1989). Critical Thinking and Subject Specificity: Clarification and Needed Research. *Educational Researcher, 18*(3), 4-10.
- Fisher, A., & Scriven, M. (1997). *Critical Thinking: Its Definition and Assessment*.
<http://lib.ugent.be/en/catalog/rug01:000438708>
- Francis, H. (2017). The role of technology in self-directed learning A literature review. *Harvard*.
https://www.academia.edu/35278698/The_role_of_technology_in_self_directed_learning_A_literature_review

- Garrison, D. R. (1997). Self-Directed learning: Toward a comprehensive model. *Adult Education Quarterly*, 48(1), 18–33. <https://doi.org/10.1177/074171369704800103>
- Gottfried, A. E., Marcoulides, G. A., Gottfried, A. W., Oliver, P. H., & Guerin, D. W. (2007). Multivariate latent change modeling of developmental decline in academic intrinsic math motivation and achievement: Childhood through adolescence. *International Journal of Behavioral Development*, 31(4), 317–327. <https://doi.org/10.1177/0165025407077752>
- Halpern, D. F. (2003). *Thought & Knowledge: An Introduction to Critical Thinking*. Psychology Press.
- Halpern, D. F. (2003). *Thought and knowledge: An introduction to critical thinking*. Psychology Press.
- Harter, S. (1996). Teacher and classmate influences on scholastic motivation, self-esteem, and level of voice in adolescents. In *Cambridge University Press eBooks* (pp. 11–42). <https://doi.org/10.1017/cbo9780511571190.004>
- Hiemstra, R. (1994). Helping learners take responsibility for self-directed activities. *New Directions for Adult and Continuing Education*, 1994(64), 81–87. <https://doi.org/10.1002/ace.36719946412>
- Hiemstra, R. (2001). Uses and benefits of journal writing. *New Directions for Adult and Continuing Education*, 2001(90), 19. <https://doi.org/10.1002/ace.17>
- Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark (2006). *Educational Psychologist*, 42(2), 99–107. <https://doi.org/10.1080/00461520701263368>
- Johnson, D. W., & Johnson, R. T. (1992). *Positive interdependence: Key to effective cooperation. Interaction in cooperative groups*. New York: Cambridge University Press.

- Johnson, D. W., & Johnson, R. T. (1999). Making cooperative learning work. *Theory Into Practice*, 38(2), 67–73. <https://doi.org/10.1080/00405849909543834>
- Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. Pearson School K12.
- Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Englewood Cliffs, NJ: Cambridge Adult Education.
- Knowles, M. S. (1984). *Andragogy in action. Applying modern principles of adult education*. San Francisco, CA: Jossey Bass.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.
- Kreber, C. (1998). The relationships between self-directed learning, critical thinking, and psychological type, and some implications for teaching in higher education. *Studies in Higher Education*, 23(1), 71–86. <https://doi.org/10.1080/03075079812331380502>
- Kuhn, D. (1999). A developmental model of critical thinking. *Educational Researcher*, 28(2), 16–46. <https://doi.org/10.3102/0013189x028002016>
- Kuo, Y.C., Walker, A.E., Schroder, K.E.E. & Belland, B.R. (2014). Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *Internet and Higher Education*, 20(1), 35-50. Elsevier Ltd.
- Lepper, M. R., Corpus, J. H., & Iyengar, S. S. (2005). Intrinsic and Extrinsic Motivational Orientations in the Classroom: Age Differences and Academic Correlates. *Journal of Educational Psychology*, 97(2), 184–196. <https://doi.org/10.1037/0022-0663.97.2.184>
- Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting & task performance*. Prentice-Hall, Inc.

- Macan, T., Shahani, C., Dipboye, R. L., & Phillips, A. R. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology*, 82(4), 760–768. <https://doi.org/10.1037/0022-0663.82.4.760>
- Marzano, R. J., Pickering, D., & Pollock, J. E. (2001). *Classroom Instruction that Works: Research-based Strategies for Increasing Student Achievement*. ASCD.
- Mathers, N. J., Fox, N. J., Hunn, A., & Group, T. F. (1998). *Surveys and Questionnaires*.
- Maxwell, J. (2009). Designing a qualitative study. *The SAGE Handbook of Applied Social Research Methods*, 214–253. <https://doi.org/10.4135/9781483348858.n7>
- Merriam, S. B., & Bierema, L. L. (2013). *Adult Learning: Linking Theory and Practice*. John Wiley & Sons.
- Mezirow, J. (1991). *Transformative dimensions of adult learning*. Jossey-Bass.
- Miller, R. L., Acton, C., Fullerton, D. A., & Maltby, J. (2002). *SPSS for Social Scientists*. <https://doi.org/10.1007/978-0-230-62968-4>
- Moon, J. A. (2004). *A Handbook of reflective and experiential learning: Theory and practice*. London: Routledge Falmer.
- Morris, T. (2018). Adaptivity Through Self-Directed Learning to Meet the Challenges of Our Ever-Changing World. *Adult Learning*, 30(2), 56–66. <https://doi.org/10.1177/1045159518814486>
- Paul, R., & Elder, L. (2019). *The Miniature Guide to Critical Thinking Concepts and Tools*. Rowman & Littlefield.
- Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In *Elsevier eBooks* (pp. 451–502). <https://doi.org/10.1016/b978-012109890-2/50043-3>
- Sagan, C. (1995). *The Demon-Haunted world: Science as a candle in the dark*. Ballantine Books.

- Sagan, C. (1995). *Wonder and skepticism*. Carl Sagan's collection
- Schon, D.A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books, New York.
- Schraw, G., & Moshman, D. (1995). Metacognitive theories. *Educational Psychology Review*, 7(4), 351–371. <https://doi.org/10.1007/bf02212307>
- Smith, J. (2020). The Role of Critical Thinking in Problem-Solving in the EFL Context. *Journal of Language Education*, 25(2), 45-62.
- Toit-Brits, C. (2019). A focus on self-directed learning: The role that educators' expectations play in the enhancement of students' self-directedness. *South African Journal of Education*, 39(2), 1–11. <https://doi.org/10.15700/saje.v39n2a1645>
- Topping, K. (2003). Self and Peer Assessment in School and University: Reliability, Validity and Utility. In *Kluwer Academic Publishers eBooks* (pp. 55–87). https://doi.org/10.1007/0-306-48125-1_4
- Tuff, K., & Tuff, T. (2012). *Introduction to population demographics*. https://www.researchgate.net/publication/290851981_Introduction_to_population_demographics
- Turan, M. B., & Koç, K. (2018). The Impact of Self-Directed Learning Readiness on Critical Thinking and Self-Efficacy among the Students of the School of Physical Education and Sports. *International Journal of Higher Education*, 7(6), 98. <https://doi.org/10.5430/ijhe.v7n6p98>
- Vallerand, R. J., Pelletier, L. G., Blais, M. R., Brière, N. M., Senécal, C., & Vallières, É. F. (1992). The Academic Motivation Scale: A Measure of Intrinsic, Extrinsic, and

- Amotivation in Education. *Educational and Psychological Measurement*, 52(4), 1003–1017. <https://doi.org/10.1177/0013164492052004025>
- Virtanen, A. (2022). What Is Kolb's Experiential Learning Theory? *Growth Engineering*.
<https://www.growthengineering.co.uk/kolb-experiential-learning-theory/>
- Virtanen, A. (2023). What Is Malcolm Knowles' Adult Learning Theory? *Growth Engineering*.
<https://www.growthengineering.co.uk/what-is-malcolm-knowles-adult-learning-theory/>
- Vonk, W., Smit, B., & Van der Voordt, D. (2017). *The impact of time management and organization on learning outcomes. In International Conference on Human-Computer Interaction* (pp. 481-495). Springer.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Massachusetts: Harvard University Press.
- Zimmerman, B. J. (2000). Attaining Self-Regulation. In *Elsevier eBooks* (pp. 13–39).
<https://doi.org/10.1016/b978-012109890-2/50031-7>
- Zimmerman, B. J. (2002). Becoming a Self-Regulated Learner: An Overview. *Theory Into Practice*, 41(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2
- Zumbrunn, S., Tadlock, J., & Roberts, E. D. (2015). Encouraging Self-Regulated Learning in the Classroom_A Review of the Literature. *ResearchGate*.
<https://doi.org/10.13140/RG.2.1.3358.6084>

Appendices

Appendix 1: Students' questionnaire on Self-directed learning and Critical Thinking

This content is neither created nor endorsed by Google Forms

I. Personal information

1. Age *

Mark only one oval.

20-24

25-29

30-35

above 35

2. Gender *

Mark only one oval.

Female

Male

I. Self-directed learning

3. I devote enough time to complete the course tasks and study for exams. *

Mark only one oval.

- never
- rarely
- Sometimes
- Often
- Always

4. I search for a range of materials in order to advance in my study. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

5. I follow what my teachers explain without questioning whether their information is reliable or not. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

6. I have a strong desire to learn new information and I am constantly inquiring *

Mark only one oval.

- never
 rarely
 sometimes
 often
 always

7. I rely on myself to further advance in my learning process *

Mark only one oval.

- never
 rarely
 sometimes
 often
 always

8. I reflect and analyze what I have learned during the lesson. *

Mark only one oval.

- never
 rarely
 sometimes
 often
 always

9. I usually seek feedback from experience teachers to help me assess my own work. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

10. I understand the importance of taking notes and I do it regularly during sessions. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

11. I explore and search about topics I am interested in not only the ones restricted by * curriculum and teachers.

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

12. I prefer to set up my own standards for measuring my performance. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

13. I am conscious of my limitations. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

14. I can examine my own abilities and rate my performance. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

15. I preset plans and use them to solve issues. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

16. I give myself a deadline that I have to stick to. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

17. I consider my mistakes as lessons. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

I. Critical thinking

18. I try to develop my problem-solving skills and evaluate their effectiveness. *

Mark only one oval.

- never
 rarely
 sometimes
 often
 always

19. Before i share my thoughts in any subject, I make an effort to present a convincing evidence. *

Mark only one oval.

- never
 rarely
 sometimes
 often
 always

20. I try to make decisions quickly and accurately. *

Mark only one oval.

- never
 rarely
 sometimes
 often
 always

21. I express my thoughts, opinions, and questions in an understandable manner. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

22. I take other students' perspectives into account before making a Judgement. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

23. I am capable of making an informed judgment and drawing a conclusion using my thoughts. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

24. I can identify the gap between rationale and results from the explanations provided for a given issue. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

25. My thoughts do not mislead me when I come across ideas or actions. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

26. I draw conclusions about the issue that is explained and I can assess the justifications for these conclusions. *

Mark only one oval.

- never
- rarely
- sometimes
- often
- always

27. I am able to identify, characterize, and explain problems *

Mark only one oval.

never

rarely

sometimes

often

always
