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# Teachers' and Students' Attitudes towards Personalized Learning in the Era of Artificial Intelligence

**The Case of First-year Master Students and Teachers , Department of English, University of 8 Mai 1945- Guelma**

**A Dissertation Submitted to the Department of Letters and English Language in Partial Fulfillment of the Requirements for the Degree of Master in Language and Culture.**

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**DEDICATION**

Firstly, my unforgettable thanks are to the Almighty Allah for providing me with uncounted blessings.

This work is dedicated to:

My adorable parents for their encouragement, patience, and endless love. To my « **Father »**, especially for his endless believe in my abilities. To my unique and kind « **Mom »**, for being supportive to my choices.

I want to thank me, for believing in me, for never quitting, and for doing all this hard work.

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*LABADLIA ACHOUAK*

## DEDICATION

Firstly, my unforgettable thanks are to the Almighty Allah for providing me with uncounted blessings.

I dedicate this work to myself for believing in me and my capacities and for every single effort I made.

To my lovely « **Father »**, the source of my power, and the diamond of my life for his unconditional love, care, patience, guidance and constant support. I miss you deeply.

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## ABSTRACT

Personalized learning is a learning approach aims to customize learning according to the individual needs, goals, and skills of learners. The rapid advancement of artificial intelligence has greatly contributed to the development of the educational process; gradually helping personalized learning to replace traditional teaching methods. In many EFL classes, students may have different learning styles and preferences. In order to facilitate learning and meet students' needs, teachers have begun to use personalized learning. The present dissertation aims at exploring the attitudes of both teachers and students towards Personalized Learning in the Era of Artificial Intelligence. In order to meet this aim a combination of quantitative and qualitative descriptive methods was used. Two questionnaires were employed one was provided to 122 First - Year Master students randomly chosen from the whole population; and one was administered to 19 First -Year Master teachers from the Department of Letters and English Language at the University of 8 Mai 1945- Guelma. The analysis and interpretation of the collected data revealed positive attitudes among teachers and students towards PL approach in the Era of Artificial Intelligence.

***Keywords:*** Personalized Learning (PL), EFL (English as a foreign language), learning styles, preferences, attitudes, era of Artificial Intelligence (AI), First - Year Master.

## LIST OF ABBREVIATIONS

**PL:** Personalized Learning

**CBE:** Competency-based education

**AI:** Artificial Intelligence

**DSRPAI:** Dartmouth Summer Research Project on Artificial Intelligence

**IBM:** International Business Machines Corporation

**ChatGPT:** Chat Generative Pre-Trained Transformer

**FGCP:** Fifth Generation Computer Task

**ML:** Machine Learning

**DL:** Deep Learning

**NNs:** Neural Networks

**NLP:** Natural language processing

**CV:** Computer vision

**CC:** Cognitive computing

**ITS:** Intelligent Tutoring Systems

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# GENERAL INTRODUCTION

Personalized Learning (PL) represents a transformative approach within the modern educational practices. Unlike traditional educational models; where students are taught equally, it is tailored to address the diverse needs, preferences, and abilities of each learner individually (Walkington and Bernacki, 2020). PL aims to customize learning experiences to better align with each student's unique learning profile. This approach not only enhances student engagement and motivation but also improves significantly learning outcomes by fostering a more interactive and student-centered learning environment (Zlatarov et al., 2021).

Recently, Artificial Intelligence (AI) integration into educational settings has further revolutionized personalized learning. AI technologies offer opportunities for adaptive learning, personalized feedback, and data-driven decision-making, enabling educators to provide more tailored educational experiences. These technologies can analyze vast amounts of data to identify learning patterns and preferences, thereby offering insights that help in customizing educational content and strategies to fit individual student needs.

The importance of personalized learning cannot be ignored, especially when AI supports it. It contributes to overall educational effectiveness by ensuring that learning is more engaging and relevant to each student. However, the successful implementation of AI-driven personalized learning depends significantly on the attitudes and acceptance of both teachers and students. Understanding these attitudes is essential for overcoming the adoption obstacles and maximizing the benefits of these advanced educational technologies.

## 1. Statement of the Problem

Personalized learning in the era of artificial intelligence (AI) transcends traditional instructional methods, evolving into a dynamic interplay of tailored teaching strategies and adaptive learning experiences. Teachers frequently observe that while some students excel in individualized assignments, they struggle with collaborative tasks. This variability underscores the necessity for AI-driven personalized learning, which can adapt to each student's unique strengths and weaknesses. Furthermore, educators often utilize a one-size-fits-all approach, focusing heavily on standard pedagogical techniques to enhance students' academic performance. However, it is crucial to recognize that learners possess diverse biological, cognitive, and psychological characteristics. Acknowledging this diversity, it becomes necessary for both teachers and students to explore innovative AI-driven educational models that cater to individual learning styles and preferences. This study examines the perceptions of educators and learners regarding the impact of AI-based personalized learning on enhancing educational outcomes.

## 2. Research Questions

The current study addresses the following questions:

1. What are teachers' attitudes towards personalized learning in the era of AI?
2. What are students' attitudes towards personalized learning in the era of AI?
3. What are the potential advantages and challenges of implementing personalized learning with the supported by AI technology?
4. How can educational institutions effectively adopt personalized learning in the era of AI?

## 3. Aims of the Study

The study aims to contribute to the existing body of literature on personalized learning, artificial intelligence, and the attitudes of teachers and students towards these technologies. By understanding the attitudes of teachers and students towards personalized learning in the AI era. Teachers can make acquainted decisions about how to integrate these technologies into their classrooms. Furthermore, this study holds significant implications for policymakers, decision makers, and technology developers who are interested in promoting effective use of technology in education. Therefore, the aim of this research is threefold:

- To examine teachers' and students attitudes towards personalized learning in the era of AI.

- To explore the potential advantages and challenges of implementing personalized learning with the support of AI technology.

- To provide recommendations for educational institutions on how to effectively adopt personalized learning in the era of AI.

## 4. Research Methodology and Design

### 4.1. Population of the Study

The population of the current study consists of EFL teachers and students in Guelma. The sample includes 19 First –Year Master Teachers of English and 122 First -Year Master Students who are selected from the whole population, which consists of 179 students at English department. They were selected randomly following Krejcie and Morgan sampling table (1970, as cited in Cohen et.al, 2000, p. 94).

### 4.2. Research Method

Our research incorporated both qualitative and quantitative methods in order to provide a comprehensive understanding of the study's objectives.

### 4.3. Data Gathering Tools

In order to meet our research objectives a questionnaire was directed to the first sample of the population; that is, (19) teachers of English. In addition to a questionnaire that was administrated to (122) First -Year Master Students. In order to investigate their perceptions concerning AI-powered personalized learning.

The main role of the teachers' questionnaire is to understand their perspectives on the benefits and challenges of AI tools, their readiness to use these technologies, and their professional development needs.

## 5. The Structure of the Dissertation

The present study falls into three main chapters predated by a general introduction and followed by a general conclusion. The first two parts are theoretical, and they give a literature review about personalized learning approach and a general overview about AI in education.

The first chapter is devoted to provide an overview of the personalized learning approach and its definitions. In addition, it gives its main purpose, the learners' diversity as well as the teachers' role within this approach. Moreover, this chapter introduces the strategies used in PL. Additionally; it represents the key elements for PL success. Finally, it highlights the challenges in implementing PL.

The second chapter introduces the meaning of AI, its history. Subsequently, discusses how it works, its fields and its classification. In addition, the chapter explores AI in education including tools and their usage, advantages and disadvantages, ethical considerations. Finally, it explores personalized with AI.

The third chapter is practical, it is devoted to study and deeply analyze the gathered data on both students and teachers attitudes towards personalized learning in AI era. It carefully interprets and evaluates the results, drawing meaningful conclusions and insights. In addition to limitations of the study, some pedagogical implications and suggestions for further studies.

# CHAPTER ONE

## Personalized Learning

**Content**

## Introduction

In rapidly changing field of education, personalized learning (PL) has emerged as a pivotal paradigm shift aimed at addressing the diverse needs, preferences, and potentials of individual learners. Accordingly, this chapter aims to provide a general overview of the personalized learning approach together with its definitions. It also outlines the approach's main goal, the diversity of the learners, and the role of the teachers. Additionally, the strategies employed in PL are introduced in this chapter. It also represents the essential components of PL success. Lastly, it emphasizes the challenges of implementing PL into practice.

## Definition of Personalized Learning

Personalized learning has been conceptualized through various definitions. As delineated by the Oxford dictionary (1995), "personalize" denotes the act of designating something to denote ownership by an individual (p. 863). Therefore, PL encompasses an instructional method tailored to accommodate the unique learning preferences and styles of individual learners.

According to Shemshack and Spector (2020), developing one's knowledge, perspective, competencies, and comprehension is possible through the personalized experience of learning (p.33). This implies that learning depends on personal experiences that contribute to the development of the learner. Thus, educational strategies should prioritize experiential learning opportunities, recognizing that individual experiences are crucial in promoting meaningful and effective educational outcomes. Furthermore, Shemshack, Kinshuk, and Spector (2021) asserted that the goal of PL is to provide instruction that is specifically tailored to each learner's needs, goals, and capabilities (p.490). This customization is facilitated through the application of contemporary instructional technologies, which deliver distinct learning experiences across various educational settings. To put it differently, PL leverages modern technology to provide

each learner with a distinct educational experience tailored to their individual learning profiles, needs, and preferences. Consequently, this approach not only enhances the relevance and effectiveness of the educational process but also promotes greater learner engagement and achievement by addressing the unique characteristics of each student. In many educational and psychological theories, there is a broad consensus that learning experiences and the gathering of knowledge are fundamentally personal endeavors (Smith, Johnson, & Davis, 2020, p. 152). This observation underscores the significance of PL as not only a straightforward but also a paramount approach to the acquisition of new knowledge. Such acknowledgment highlights the efficacy and accessibility of tailored educational strategies in facilitating effective learning processes tailored to individual needs and preferences.

Moreover, “Instruction in which the learning pace and instructional methods are tailored to meet the individual needs of each student” is how the U.S. Department of Education defines personalized learning (Walkington & Bernacki, 2020, p.240). This indicates that PL is a method of instruction tailored to the individual needs of learners, recognizing their diverse strengths, weaknesses, interests, and learning styles, with the goal of addressing these variations to improve overall learning outcomes. This approach is grounded in the educational theory that individualized learning paths can significantly enhance student engagement and achievement by catering to each learner's unique profile. Furthermore, PL constitutes an integrated approach to activities that result from self-organization (Chatti, Jarke, & Specht, 2010, p. 74). This conveys that PL involves a cohesive method where educational activities are not pre-structured by educators alone but emerge organically based on the learners' own organizational efforts. This approach leverages the learners' capacity to self-direct and manage their learning processes, thereby fostering greater autonomy and engagement in their educational journey.

Hence, personalized learning is regarded as an effective method that can enhance student motivation, engagement, and awareness (Pontual Falcão et al., 2018, p. 167). This signifies that such tailored educational strategies not only improve student motivation and engagement but also increase their awareness and understanding of the learning material. This approach aligns with contemporary pedagogical theories that advocate for student-centered learning environments to optimize educational outcomes.

Drawing on these definitions, it can be concluded that a novel educational approach, termed 'personalized learning,' has been developed to enhance student learning efficacy. This approach, defined by 'student-centered instruction,' has recently emerged as a leading instructional methodology. PL customizes the educational experience to address the unique needs, preferences, and learning pace of each student, thereby improving the quality of education. By tailoring the learning process, this method aims to establish an optimal educational curriculum that benefits both learners and educators.

### 1.2. The Purpose of Personalized Learning

Many new educational methods have been created, including personal education, in order to contribute to the development of education by providing solutions or alternatives to many problems that concern teachers and students alike.

Firstly, PL aims to tailor the educational experience to accommodate the distinct needs and interests of individual students, thereby enhancing the relevance and engagement of the curriculum across diverse student populations (Jones, 2021, p. 75). This means that PL aims to create a curriculum that is suitable and attractive for the largest number of students, regardless of their abilities and needs. To achieve this, an excellent curriculum that attracts to students with varying preparation levels, interests, cultural backgrounds, intelligence preferences, and learning styles is made accessible through a variety of access points. Also, tailoring each

student's curriculum to match their needs, interests, and abilities is the primary objective of personalized learning" (Brown & Smith, 2021, p. 78).This emphasizes that PL takes into account students' differences and interests when designing special curricula for them.

Second, Jones and Smith (2021) added that tailoring learning experiences to match students' interests and readiness levels is crucial for enhancing engagement and improving learning outcomes, facilitating deeper understanding and promoting higher achievement (p. 76). This implies that, by informing students about the curriculum, we find that PL focuses on students' continued interest in studying and also encourages them to deepen and expand their understanding of the lessons while achieving many individual and group achievements. Furthermore, Pontual Falcão et al. (2018) demonstrated that PL is an effective approach for enhancing students' motivation, engagement, and comprehension of course material (p. 165). This indicates that PL is a highly effective strategy for enhancing students' motivation, engagement, and understanding of course content.

Moreover, PL allows each student to independently choose from a variety of teacher-prepared activities, promoting holistic growth in cognitive, social, and ethical dimensions (Smith & Jones, 2022, p. 45). In other words, PL provides students with the freedom to choose the activities they prefer from among the activities that the teacher has prepared in advance, which contributes to the full development of students intellectually, socially, and morally.

Finally, PL emerges as an educational framework that focuses on customizing teaching methods to match learners' unique strengths, preferences, requirements, and aspirations, thus increasing their motivation, engagement, and understanding of academic content.

### 1.3. Key Elements for Personalized Learning Success

Kallick and Zmuda (2017), assert that the fundamental components necessary for achieving success include setting goals, generating inquiries or ideas, identifying tasks and audiences, completing assessments, presenting cumulative learning, creating a lesson plan, and giving feedback (p. 17).

In the first place, goals refer to the intended outcomes that educators and students aim to attain by the end of the learning process. Instructors must determine the desired degree of achievement at the end of the teaching process by taking into account the prior knowledge and present competence levels of their students. This understanding is crucial for designing lessons that are both effective and suitable for all students. In addition, in a PL environment, students and teachers work together to identify both appropriate subject-specific and cross-disciplinary goals and dispositional goals that are appropriate, given the topic, the time available, and each student's aspirations (Kallick & Zmuda, 2017, p. 18). This entails that setting goals in personalized education requires the participation of both teachers and students to recognize subject-specific and cross-disciplinary goals, for example, enhancing students' critical thinking, increasing their willingness to collaborate with each other, and raising their sense of creativity. Furthermore, dispositional goals such as focusing on improving students' impulsive management and listening with understanding and empathy.

Subsequently, inquiry or idea generation in PL is achieved by creating a learner-centered environment by focusing on topics that grap students' interest and encourage them to expand their knowledge. This is achieved by teachers focusing on mental activities such as asking questions, thinking about a radical solution to various problems, and thinking flexibly while hearing their different points of view. For example, the teacher gives students an assignment related to health matters and asks them to investigate a health concern that matters to them or

their loved ones and develop an informed statement (Kallick & Zmuda, 2017, p. 20); during this type of activity, students work to present their own ideas, as well as their various experiences and interpretations, in a convincing manner, with the possibility of improvising and imagining different situations that they can be asked about.

Additionally, task and audience refer to the manner in which the audience influences the dynamics of creativity and communication between them and the students. Kallick and Zmuda (2017) stated that PL necessitates giving students more chances to present their knowledge, concepts, and performances to audiences besides their instructors (p. 22). This indicates that the primary objective of this task is to enable students to communicate their ideas, information, and perspectives to audiences beyond their instructor. For instance, students might create a school magazine, allowing them to explore topics of personal interest, educate their teachers, classmates, and parents, and engage in research and dissemination activities.

Evaluation in personalized education is done by evaluating students' activities according to certain criteria. The instructor is not the only one who judges the students' work in this instance; the students analyze their own work initially, and then their work is assessed by a number of referees with different backgrounds and qualifications who review the work according to specific criteria. According to Kallick and Zmuda (2017), using criteria identified by an outside organization or modeled on real-world standards helps give tasks authenticity (p. 23). This confirms that using external criteria based on real-world standards helps students see the originality of their work. For example, the teacher asks the students to write a short story based on their imagination and participate in exhibitions that are judged by appointed judges according to different criteria.

Cumulative demonstration of learning means how we show evidence of learning over time. PL provides a transition from a scoring system that demonstrates achievement based on the

accumulation of grades to one that is portfolio-based and asks students to focus on their growth over time (Kallick & Zmuda, 2017, p. 24). This reflects that PL focuses on supporting students to continue to grow over time and achieve better, rather than focusing solely on collecting grades. In addition, it works to increase the students' sense of responsibility by collecting and organizing their work to identify their areas of strength and areas of growth. It also helps them identify their shortcomings and determine their future goals.

In addition, an instructional plan is done by designing an appropriate plan for learning. In the context of PL, the instructional framework is tailored through collaborative discussion between educators and students concerning curriculum content, thematic focus, class structure, and peer groupings. As teachers become more comfortable with relaxing their grip on instruction, students have a greater opportunity to advocate for and even determine its sequence, pace, and content (Kallick & Zmuda, 2017, p. 25). This implies that students will have greater opportunity to choose the subject matter and pace of the class if a teacher is more flexible with them. The primary objective of the instructional plan is to help students become more independent by allowing them to utilize a variety of resources without authorization and teaching them appropriate and responsible usage techniques so they can get the knowledge and experience they need.

Finally, feedback is considered one of the most important steps in the learning process and has a pivotal role in the growth of learners. Kallick and Zmuda (2017) mentioned that transitioning to a PL environment calls for going from a situation in which the teacher is the sole provider of feedback based on expected checkpoints to one in which students ask for feedback at natural stopping points (p. 27). This suggests that rather than continuing to receive feedback from the teacher only according to set goals, students in a PL environment seek it at natural stopping points. The fundamental objective of feedback is to help students develop the

habit of remaining open to continuous learning by learning from previous mistakes and from the guidance provided by the professor.

These components collectively foster an educational environment tailored to individual student needs, enhancing engagement and learning outcomes. Ultimately, PL requires a holistic approach that balances technological innovation with pedagogical flexibility.

### 1.4. Challenges in Implementing Personalized Learning

Although PL holds great promise in meeting the unique needs of each student, there are a number of implementation-related obstacles to overcome. The successful adoption and application of individualized learning methodologies in educational contexts may be hampered by these difficulties.

**1.4.1. Infrastructure and Technological Constraints:** One significant challenge is the centralization of technology to support PL initiatives (Redding, 2016, p. 5). This includes a reliable internet connection, access to digital devices, and appropriate software platforms designed to meet personal learning needs.

**1.4.2. Teacher Training and Professional Development:** Effective teaching requires teachers to adapt their instruction to the diverse needs of their students (Tomlinson, 2014, p. 2). However, for educational institutions, offering thorough training and continual professional development opportunities to teachers presents a logistical difficulty. Without proper support and resources, even the most skilled teachers may struggle to effectively tailor their instruction to meet individual student needs.

**1.4.3. Data Privacy and Security Concerns:** In order to tailor instruction, PL depends on gathering and evaluating enormous volumes of student data including their levels of readiness, interests, learning styles, and a host of other unique learning characteristics (Graham and

Phelps, 2003, p. 2). However, given that educators must manage intricate legal and ethical issues when managing sensitive student information, worries about data privacy and security present serious difficulties.

**1.4.4. Equity and Access Disparities:** According to Means and Neisler (2018), the adoption of PL initiatives has the potential to worsen already-existing equity and access inequities among students (p. 45). The achievement gap may increase if underprivileged students do not have access to the resources or technology needed to properly benefit from individualized learning approaches.

**1.4.5. Assessment and Evaluation Challenges:** The varied learning outcomes connected to PL approaches might not be adequately measured by conventional evaluation techniques (Guskey, 2019, p. 42). New evaluation methods and procedures are needed to evaluate student development and the success of PL strategies.

For PL programs to be successfully implemented in educational settings, some obstacles must be overcome. Educators and policymakers may work to realize the full potential of PL to improve student outcomes by recognizing and proactively addressing these barriers.

### 1.5. Learners' Diversity within PL

Although they share common traits such as the desire to learn and grow, learners have a variety of differences that greatly impact their learning process. Knowing these differences is essential to deal with the different challenges that learners face in their educational journey. According to Tomlinson (2001), there are variations among learners in terms of their learning profiles, interests, and readiness to learn (p. 12).

Tomlinson (2001) defines readiness as learners' skills and understanding of a topic, suggesting that those with greater proficiency are better prepared to learn (p. 25). Furthermore,

Tomlinson (2014) emphasized that learners exhibit different levels of readiness, resulting in varying needs and goals. Consequently, learners with lower readiness levels require effective guidance from instructors to identify and address their learning gaps (p. 18).

Tomlinson and McTighe (2006) asserted that assigning tasks aligned with student readiness levels expands their knowledge, understanding, and skills slightly beyond their independent capabilities (p. 19). This necessitates instructors to tailor activities closely to individual learners' levels and abilities, facilitating improved comprehension and development in their learning. Such tailored approaches are pivotal in cultivating a conducive learning environment wherein students can effectively engage with content, leading to enriched educational outcomes and holistic academic growth.

Thus, assessing learners' readiness is essential for selecting suitable content and creating a PL environment. This approach enables advanced learners to enhance their understanding and skills, while simultaneously providing support for less advanced learners to improve and catch up with their peers.

Furthermore, another distinguishing factor is interest. According to Tomlinson (2001), interest reflects a student's curiosity and passion, driving their desire for knowledge and self-improvement (p.45). This interest can fluctuate over time and varies by subject matter, with learners showing greater engagement and motivation when presented with topics that captivate them. Therefore, identifying topics that interest learners is a vital step in the education process. This emphasis on learner interest aligns with constructivist educational theories, which advocate for student-centered learning environments. By integrating topics that resonate with students' intrinsic motivations, educators can enhance engagement and facilitate deeper, more meaningful learning experiences. Consequently, tailoring educational content to individual

interests not only supports academic achievement but also fosters lifelong learning and intellectual curiosity

Moreover, the last difference between learners is their learning profile. Tomlinson (2001) defines the learning profile as each student's preferred way of working, indicating that every learner has a method that suits them best (p. 45). Reiff (1992) found that learning styles affect how teachers and students interact as well as how students learn (p. 7). Understanding learners' preferred styles can facilitate the learning process. Educators suggest that teachers and course designers should consider these styles and tailor their interventions accordingly (Pashler et al., 2008, p. 105). In short, knowing each student's learning style is crucial for selecting appropriate materials and facilitating effective learning.

Consequently, realizing that learners have different characteristics that affect the learning process significantly reduces the time and effort spent on improving their level.

### 1.6. Teachers' Role within PL

Teaching methods are no longer teacher-centered, where the teacher is the active participant and the students are passive. Rather, students became the most active participants, and teachers began to play other roles. This shift reflects a broader pedagogical change towards constructivist approaches, which emphasize active learning, critical thinking, and student engagement. Teachers now act as facilitators and guides, providing support and resources to help students take ownership of their learning. This transformation in teaching strategies has been shown to enhance student motivation, foster deeper understanding, and promote collaborative learning environments. Additionally, the integration of technology in the classroom has further empowered students to explore and interact with content dynamically, making learning a more personalized and interactive experience. According to Powell and Kusuma-Powell (2011), teachers need to engage in five ongoing inquiries. Educators must

work to understand their students as learners, themselves as teachers, their curriculum, their assessments, and their collegial relationships (p. 7). Therefore, in order to effectively PL, teachers need to be aware about all these inquiries.

### 1.6.1. Knowing Students as Learners

Graham and Phelps (2003) emphasize that understanding students as learners requires teachers to systematically consider various aspects of students' identities (p. 2). This implies that knowing students as learners requires a methodical and purposeful investigation of their individual characteristics, including their cultural identities, linguistic backgrounds, levels of readiness, interests, learning styles, and a host of other unique learning characteristics. In this step, teachers need to be flexible so that they can respond to different learner abilities, needs, and interests, and also to allow students to follow exactly what the teacher is trying to teach them as it suits their specific needs and learning styles. Thus, teachers will be able to understand each one of their students deeply.

According to Erwin (2004), creating a supportive classroom atmosphere begins with understanding each student's unique background and needs (p. 8). This awareness fosters a sense of psychological safety where students feel valued and connected, which is essential for their emotional and academic growth. This foundation enables teachers to assess each student's readiness for learning, guiding them on what and how to teach. Teachers can also identify multiple access points to the curriculum, making content meaningful and increasing engagement. By knowing their students well, teachers enhance their emotional intelligence, becoming more flexible, sympathetic, and patient. Consequently, teachers can better support their students by tailoring their instructional approaches and creating an inclusive, engaging learning environment.

### 1.6.2. Teachers' Self-reflection

Educators need to be aware of their position as teachers through in-depth knowledge of their own psychology. Gay (2010) emphasized that educators must develop an understanding of their students' cultural backgrounds while also engaging in critical self-reflection on their own cultural identities and biases (p. 147). This reflective practice is essential for devising inclusive and effective teaching strategies, ultimately enhancing students' educational experiences and outcomes. Accordingly, teachers must understand themselves and learn more about their preferences, viewpoints, and expectations, in order to understand their students better. Every teacher needs a high degree of self-awareness that enables him or her to clearly distinguish him, or herself from other teachers. This is the most important step for teachers to know their role appropriately, because when they know more about themselves, they will know exactly what they need to do.

### 1.6.3. Knowing the Curriculum at a Conceptual Level

According to Powell and Kusuma-Powell (2011), knowing the curriculum at the conceptual level means being able to distinguish between content and transferable concepts (p. 8). In this case, teachers are able to distinguish between concrete, concrete knowledge (content), abstract ideas, or skills (transferable concepts) that can be applied to many specific content areas. To provide flexibility in choosing access points for students with diverse cultural backgrounds and learning preferences, for example, use reading a storybook such as “Beauty and the Beast” and identify the characters and events. While transferable content enhances storytelling and imagination, which can be applied to a variety of creative activities such as writing their own stories, drawing storyboards, or acting out plays.

### 1.6.4. Knowing the Assessments

According to Angelo and Cross (1993), assessment is the process of gathering, interpreting, and using information to aid understanding and improve performance (p. 4). This signifies that assessment is a tool used by teachers to collect the necessary information about students in order to choose the necessary actions to improve the quality of learning. Angelo and Cross (1993) asserted that, effective assessment begins with clear learning objectives. These objectives define the content and skills students are expected to learn (p. 4). The choice and design of assessment techniques should reflect these objectives, ensuring that what is assessed is what was intended to be learned; to do this, teachers need to identify learning objectives and then choose assessment methods to obtain appropriate results. This may involve offering students some choice in assessment to increase engagement, and bringing students inside the assessment process so that they become the end users of assessment data. This may include allowing students to choose between different types of projects, presentations, or research papers or engaging them in different aspects of assessments that match their interests, learning styles, or strengths.

### 1.6.5. Knowing the Collegial Relationships

Austin and Baldwin (1991) claimed that effective collaboration among educators involves pooling the varied skills, knowledge, and experiences of all staff members to address the unique needs of each student (p. 6). This shared professional practice not only enhances teaching but also ensures that every student benefits from the collective expertise of the entire educational team. Teachers must coordinate with each other, using their different experiences, to make the learning process more suitable and easy for the students. In addition, the best schools are those that value collegial relationships among teachers because collaborative practices allow teachers to learn from each other, share best practices, and receive feedback about their teaching. This

continuous learning process supports teacher effectiveness and fosters a culture of lifelong learning within the school community.

Gaining more knowledge about these five areas of PL is the most important step towards achieving success and improving the quality of teaching, it assists educators in adopting a broad perspective on the field of personalized learning and comprehending the responsibilities they have within it.

## 1.7. Personalize Learning Strategies

### 1.7.1. Personal Competencies

The following strategies are the main strategies for improving students' personal competencies:

#### 1.7.1.1. Cognitive Competency

Cognitive competency is characterized by its integrative nature, based on students' self-activity and personal responsibility. This includes linking the student's prior knowledge (from any source) to new topics (Kassymova et al., 2020, p. 3689).This method makes use of the learner's existing experiences and knowledge, fusing them with fresh material to provide a seamless educational process. . By bridging past and new knowledge, students can more effectively understand and retain new concepts, thus fostering deeper learning and critical thinking skills.

Cognitive competency is a psychological construct that cannot be directly observed but can be inferred from an individual's behavior or performance on content-relevant tasks (Wang, 1990, p. 220). This means that even though cognitive competency is invisible, it may be assessed by an individual's performance on activities requiring particular cognitive abilities. A person's cognitive ability can be demonstrated, for instance, by correctly memorizing

information or solving a challenging arithmetic problem. Through careful observation and measurement of these actions, psychologists are able to determine an individual's level of cognitive competency.

These opinions emphasize that, although abstract, cognitive competency can be increased by using instructional strategies that combine newly learned material with previously acquired knowledge.

PL tailors educational experiences to meet individual cognitive needs and learning styles, thereby enhancing students' ability to grasp and apply knowledge effectively. This customized approach supports the development of cognitive skills by providing targeted challenges and resources, ultimately fostering deeper intellectual engagement and growth. For example, Programs like Khan Academy tailor math problems to the individual student's current skill level. If a student struggles with fractions, the software provides additional practice and instructional videos specifically on fractions. Conversely, if a student excels at algebra, the program offers more complex algebraic problems to challenge them. This targeted approach helps students strengthen their understanding where they need it most and accelerates learning in areas of proficiency. By addressing individual cognitive needs and learning styles, the software fosters deeper intellectual engagement and supports the development of critical cognitive skills.

#### 1.7.1.2. Metacognitive Competency

Metacognitive competency improves when students observe teachers verbally articulating their mental processes while tackling learning tasks. It is possible to explicitly teach and acquire a variety of learning strategies and techniques (Redding, 2016, p. 22). Additionally, teaching with metacognition involves instructors “thinking about their own thinking regarding their teaching” (Hartman, 2001, p. 149). This demonstrates that students' metacognitive skills

improve when teachers openly share their mental processes while working through learning tasks. By doing this, instructors set an example of effective strategies and methods that students may copy and follow. This approach helps students become more aware of how they think about their own thinking, thus improving their ability to learn and apply new information.

Metacognitive competency is essential for personalized learning, as it allows students to understand and manage their own learning processes. Strong metacognitive skills enable students to assess their needs, set goals, and choose strategies, leading to better academic outcomes. This self-awareness and self-regulation enhance the efficacy of PL by enabling students to take ownership of their education, adapt to various learning situations, and ultimately achieve better academic outcomes.

#### 1.7.1.3. Motivational Competency

A growth mindset fosters perseverance towards goal achievement, differentiated instruction adapts to individual student readiness, and aligning learning objectives with students' personal goals enhances motivational competency (Smith, 2020, p. 45). This highlights the importance of having a growth mindset, which encourages people to see obstacles as chances for personal development and education. This kind of thinking encourages perseverance and strength, which are vital skills for students trying to achieve academic success.

Furthermore, both the students' and the instructors' desire to see the students progress and become more committed to learn are the sources of motivational competency.

#### 1.7.1.4. Social/Emotional Competency

Social and emotional competencies encompass a range of skills, including self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. These skills can be developed through intentional instruction and practice" (CASEL, 2020, p.

12). In the field of social and emotional competence, the integration of interpersonal and intrapersonal abilities, along with effective emotional regulation, is pivotal. By acquiring and teaching diverse methodologies, strategies, and competencies, individuals can skillfully navigate decision-making processes, engage in meaningful social interactions, and set attainable goals, thus enhancing their overall well-being and success.

Moreover, classroom standards support the development of social skills and academic learning by encouraging individual responsibility, teamwork, and care for others. Parent programs help raise responsible children and make parents aware of their emotional needs. In addition, social and emotional competency is addressed by numerous evidence-based programs that are implemented across the school, in individual classrooms, or with particular kids. Students' social and emotional competency plays a crucial role in the effectiveness of PL. When students possess strong skills in self-awareness, self-management, social awareness, relationship building, and responsible decision-making, they are better equipped to take charge of their PL journeys.

### 1.7.2. Competency-Based Education

Competency-based education (CBE) is learning approach that emphasis on learners' mastery of specific skills and knowledge rather than the completion of a predetermined period of time in a course or program. Learners progress based on demonstrating proficiency in clearly defined competencies or learning outcomes, allowing for PL pathways and targeted support to meet individual needs.

According to Redding (2016), Competency-based education can be implemented in PL through the following main strategies (p. 12):

#### 1.7.2.1. Flexible Credit Schemes

Flexible credit systems are designed to allow students to accumulate credits through multiple avenues, thereby supporting personalized learning pathways and recognizing diverse educational experiences (Smith, 2018, p. 45). These schemes allow students to gain credits through a range of methods, such as coursework, assessments, experiential learning or prior knowledge assessments. Flexible credit systems incorporate credit recovery, early college high school assessments, dual enrollment, and numerous pathways to graduation, thereby separating the connection between learning, assessment, and class time.

**Dual enrollment and early college high assessment:** dual enrollment within PL allows students to tailor their academic path to their unique interests, abilities, and pace of learning. Also, PL plans allow students to choose college-level courses rather than having to follow a curriculum that is designed for everyone. With this flexibility, individuals can continue to meet their high school graduation requirements while going deeper into things they are passionate about or moving more quickly in areas where they demonstrate proficiency.

**Credit recovery (CR):** CR involves a student successfully completing and obtaining credit for a course that they previously attempted but did not pass, thus failing to earn the necessary academic credit towards graduation. This denotes that CR programs provide students with an opportunity to retake and pass courses they failed, ensuring they can meet the academic requirements needed to graduate.

**Multiple paths to graduation:** Multiple pathways are a crucial component of PL environments as they offer diverse, equally rigorous routes for students to explore their interests and acquire the practical skills and experiences necessary for success beyond high school.

In conclusion, flexible credit schemes provide a dynamic framework that enables students to personalize their educational experiences, enhancing adaptability and facilitating diverse paths to academic success.

#### 1.7.2.2. Service Learning

Service learning is integrated into various aspects, while social and emotional learning initiatives fit seamlessly into personal learning environments. Community-oriented learning that aims to develop competencies, whether personal, academic or professional, expands learning opportunities beyond traditional school hours and provides students with rich experiences beyond the confines of the classroom (Redding, 2016, p. 12). In contemporary education, service learning and social-emotional initiatives are seamlessly integrated into academic endeavors, reflecting the principles of PL. This integration caters to individual needs and preferences, enhancing the educational experience. Community-oriented learning extends beyond traditional classrooms, fostering competencies across personal, academic, and professional realms. By providing diverse real-world experiences, these initiatives enrich students' learning journeys, deepening their understanding of societal contexts. An example of this integration can be seen in a high school curriculum where students participate in a service-learning project focused on environmental conservation. Through this project, students not only learn about ecological principles but also develop social-emotional skills such as teamwork, communication, and empathy as they collaborate with peers and community members

#### 1.7.2.3. Internships and Job Shadowing

Internships and shadowing experiences offer students practical learning opportunities in business settings tailored to their interests and targeted competencies. This form of experiential learning allows students to observe and engage with professionals in real-world contexts,

providing valuable insights into specific careers and fields. Accompanying and observing an employee throughout their workday provides a glimpse into the daily responsibilities associated with a particular job post-graduation. Throughout the experience, students are encouraged to ask pertinent questions and take notes to enhance their understanding of the profession (Redding, 2016, p. 12).

#### 1.7.2.4. Differentiated Staffing

In a PL environment, it is both possible and advantageous to utilize teachers' varied skills and passions, as students' advancement in competencies is measured by demonstrated mastery rather than specific course enrollments (Patrick & Sturgis, 2018, p. 25). In such a differentiated staffing model, the focus is on students' mastery of competencies, allowing for the effective utilization of teachers' unique abilities and expertise. This approach capitalizes on the individual strengths and specializations of educators to more accurately assess and support students' competency development.

#### 1.7.2.5. Acceleration and Enrichment

When the pace of learning is made fluid, allowing students to advance more rapidly upon demonstrating mastery, it encourages them to explore curricular content beyond the standard syllabus (Redding, 2016, p. 12). Consequently, acceleration and enrichment occur seamlessly, as flexible pacing enables students to progress swiftly as they exhibit proficiency and inspires them to engage with additional subjects outside the core curriculum. This approach not only fosters a deeper understanding of the material but also cultivates a love for learning, preparing students for lifelong intellectual engagement and adaptability in various fields.

#### 1.7.2.6. Recognition of Mastery

Skill acquisition can be validated by awarding digital badges, whereas academic credits and certificates can be used to certify proficiency (Jones, 2018, p. 45). In competency-based education, mastery recognition is the formal process of identifying when a student has shown proficiency in particular competencies or learning objectives. During this process, students who demonstrate mastery are given badges and awards. The goal of this process is to reward students and encourage them to master more skills.

#### 1.7.2.7. Student learning Plans

Student learning plans, or individual learning plans, are tailored to accommodate the unique needs and pace of each student, allowing them to follow personalized pathways to achieve academic standards. While developing these plans with student input can be time-consuming for teachers, the use of instructional software has significantly streamlined the process, enhancing efficiency and effectiveness (Ferguson, 2001, p. 7). In conclusion, the integration of instructional software into the development of student learning plans not only expedites the process but also ensures that individualized education remains a priority, thereby promoting enhanced learning outcomes for all students.

#### 1.7.2.8. Study Groups and Research Teams

Study groups and research teams facilitate collaborative efforts among students to develop projects geared towards testing a hypothesis or achieving a specific outcome. These student cohorts may consist of classmates within the same course, or they may be formed remotely via online platforms, spanning geographical distances (Loes, 2022, p. 2). This suggests that in PL, study groups and research teams are essential components intended to foster a collaborative environment in which students use their unique ideas, strengths, and learning styles to

collectively achieve a common learning goal. This approach not only develops a sense of teamwork and collaboration, but also enhances students' critical thinking skills and promotes a deeper understanding of the subject. Ultimately, the collaborative nature of study groups and research teams in PL settings contributes to the overall development of students and prepares them for success in academic and professional endeavors.

### 1.7.3. Use of Technological Tools

According to Redding (2016), the integration of educational technology enables the practical implementation of personalization, thereby decreasing the time educators need to customize instruction, increasing access to different content, arranging content and activities into practical pathways, measuring progress, and facilitating both individual and group work regardless of temporal or spatial limitations (p. 11). In alternative terms, educational technology renders personalization feasible by reducing the time educators must allocate to individualizing instruction, granting access to an extensive array of resources, structuring them into coherent pathways, assessing student advancement, and facilitating both individual and collaborative endeavors across varied temporal and spatial dimensions. Blended learning, an approach to personalization, integrates conventional classroom teaching with online delivery of instructional materials and activities, extending learning beyond the classroom environment. This affords students varying degrees of autonomy over the timing, location, pace, and direction of their learning (Dziuban, Hartman, & Moskal, 2004, p. 3). This pedagogical strategy, known as blended learning, combines traditional face-to-face instruction with online resources, allowing students to exert control over their learning experiences. Technology in blended learning serves as a complement to, rather than a substitute for, traditional teaching methods, enhancing established pedagogical practices. For instance, amid the COVID-19 pandemic, technology has played a pivotal role in reshaping education by facilitating remote

learning through online platforms and applications, keeping the educational process going even while schools are actually closed.

## Conclusion

The twenty-first century has seen major developments in education, with the aim of creating systems that are accessible and adaptable for all. By leveraging technology and personalized learning, education strives to meet diverse needs and provide quality opportunities for all. Accordingly, PL is the most appropriate modern educational method for learners, as it enhances their engagement, improves outcomes, and fosters a deeper understanding of the material, ultimately preparing students for success in a rapidly changing world.

## CHAPTER TWO

## Artificial Intelligence

**Content**

## Introduction

Technology integration in the educational setting has been a subject matter for many years among teachers. Artificial intelligence (AI) is one of the most prominent means of technology in the modern age. Its emergence has brought about a big change in various sectors, including education. Correspondingly, the current chapter introduces the meaning of AI, its history. Subsequently, discusses how it works, its fields and its classification. In addition, the chapter explores AI in education including tools and their usage, advantages and disadvantages, ethical considerations. Finally, it explores personalized learning with AI.

## 2.1 Artificial Intelligence

### 2.1.1 Defining Artificial Intelligence

Mueller and Massaron (2018) said that the term intelligence involves specific cognitive processes including the ability to learn new information, manipulate that information in different ways, understanding and verifying the manipulated information, recognizing relationships between data, considering meaning and be able to distinguish between fact and belief. This is done by creating algorithms and feeding data to a computer (p. 8-12). Based on this definition, artificial intelligence is described as intelligence achieved by artificial means, that is, intelligence that does not exist in nature and is created as a copy of something that already exists. In this case, it is human intelligence.

According to the Encyclopedia Britannica, artificial intelligence is the ability of a computer or a computer-controlled robot to perform tasks that would typically need human intelligence and judgment, and which were previously solely performed by humans. AI can reduce human error by learning from past mistakes. It can also make unbiased selections, whereas a human may be swayed by something in their choice (Copeland, 2023).

## 2.2 Historical Evolution of AI

Artificial intelligence began in 1950, when Alan Turing, a computer pioneer, devised the technology that enabled it. Turing had previously discussed the possibility of an intelligent machine. In 1950, Alan Turing conducted the Turing Test to see whether a machine could think like a human. This test involves a computer, a human interrogator, and a human response. The interrogator poses any type of inquiry to the computer and the respondent, and based on the responses, must guess which is the computer. The human reply must assist the interrogator in making an accurate guess, but the computer may react in any fashion that allows it to remain anonymous (Copeland, 2023).

Newell, Shaw, and Simon (1955), created Logic Theorist which is a computer program designed to emulate human problem-solving ability. Many consider this to be the first artificial intelligence software. However, it was not until 1956 that John McCarthy coined the term 'artificial intelligence' at the Dartmouth Summer Research Project on Artificial Intelligence (DSRPAI) meeting on the Dartmouth College campus, in which a number of notable scholars took part. This incident sparked intensive research into AI as a field, even though they were unable to fully agree on standard procedures for it. Throughout the following decades, artificial intelligence advanced; for example, Joseph Weizenbaum created ELIZA, a chat bot capable of conversing with people. In the 1970s, expert systems were first debuted; the phrase is no longer used, although it still exist, such as a rule-based grammar check. Expert systems were designed to make choices in the manner of a human expert, using a rule-based, frame-based, or logic-based procedure (Anyoha, 2017).

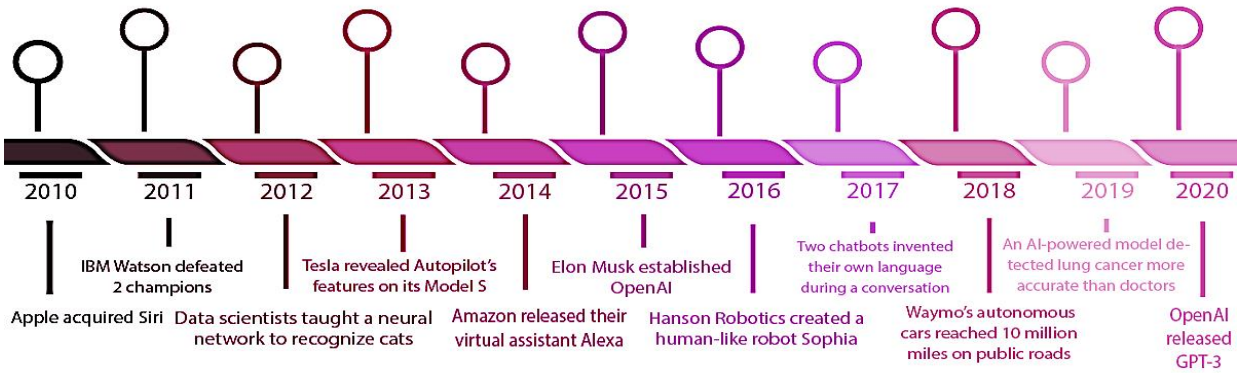
By the 1980s, the AI revival was sparked by the development of algorithms as well as increased funding. Some of key contributions recorded were those of John Hopfield and David Rumelhart, who developed the concepts of deep learning techniques. In addition, Edward

Feigenbaum invented expert systems; something that works like human decision-making processes. The advanced systems were applicable in a number of enterprises and received funding from the Japanese government, which was chanelled through the Fifth Generation Computer Task (FGCP), but most of its high objectives failed to be acquired. However, it made a big impact on engineers and scientists in a brand new era (Anyoha, 2017).

In 1997, a remarkable event happened, when a chess champion Gary Kasparov lost a game against IBM (International Business Machines Corporation), Deep Blue, a chess computer program. Numerous journalists and media outlets were present to witness and report on the historic event. The match garnered worldwide attention, paving the way towards the development of artificial intelligence decision- making program (Anyoha, 2017; Mueller & Massaron, 2018, p.16).From the 1990s to the 2000s, AI thrived and achieved its objectives.

**Figure 2.1**

*AI Timeline 2010*




Note. Significant milestones in artificial intelligence during the 2010s. Adapted from "Evolution of Artificial Intelligence in Business," by LITSLINK, 2024, LITSLINK. Copyright 2024 by LITSLINK. Adapted with permission.

There have been numerous noteworthy accomplishments throughout the 2010s. For example, Apple introduced the personal assistant Siri for their smartphones, while Amazon

released their virtual assistant Alexa (Figure 2.1). Nowadays, hundreds of new artificial intelligence-based technologies are produced daily, each designed to do a distinct task. The most recent significant developments in AI are the chatbots ChatGPT (Chat Generative Pre-Trained Transformer) by OpenAI, the translator tool DeepL, and Bard by Google.

## 2.3 How Does Artificial Intelligence Work?

Understanding artificial intelligence on a deeper level requires an understanding of how it works. AI learns through experience, combining massive volumes of data with clever, iterative processing algorithms. The technology analyzes the data and automatically learns from observed patterns. Every time the system processes data, it identifies its performance and improves its intelligence to execute the task for which it was designed. AI can be trained fast because it does not require downtime and can execute millions of tasks at high speeds. It is crucial to recognize that AI is a broad field of study, not just a program (CSU Global, 2021). This explanation however is too general and a deeper exploration is needed to scout AI different components to understand deeply how each of them work.

## 2.4 Artificial Intelligence Fields

Artificial intelligence is classified into various categories, including machine learning (ML), deep learning (DL), neural networks (NNs), natural language processing (NLP), computer vision (CV), and cognitive computing (CC). Understanding these components, sometimes known as subfields, is important when implementing AI.

**2.4.1 Machine Learning** is an extensively used method in AI. It allows computer systems, programs, or applications to self-learn and improve from data without being programmed. ML algorithms uses training data to create models that detect patterns in data, determine insights, and enhance the outcomes of whatever activity the system was designed to accomplish. Image and speech recognition are two examples of applications for machine learning. It recognizes

and categorizes the objects displayed in an image (Athanasopoulou, Daneva, Adamopoulos, & Scorilas, 2022, p.727-744.).

**2.4.2 Deep Learning** is a sort of machine learning that enables AI to learn and develop through data processing. Deep Learning employs artificial neural networks that resemble biological neural networks in the human brain to process information, establish connections between data, and generate inferences or results based on positive and negative feedback. Virtual assistants, such as Siri or Alexa, are practical examples of deep learning (CSU Global, 2021).

**2.4.3 Neural Networks** a method that analyzes data sets repeatedly in order to uncover associations and extract meaning for the undefined data. Neural Networks function similarly to neuron networks in the human brain, allowing AI systems to take in massive data sets, identify patterns in the data, and answer questions about them (CSU Global, 2021).

**2.4.4 Natural Language Processing,** Lu et al. (2020) defined it as a vital component of artificial intelligence (AI), which enables computers to process human language, spoken or written and interpret the significance of the words using algorithms (p. 21–38). Chatbots as an example (as cited in Salas-Pilco & Yang, 2022). Any AI-driven system that communicates with people in any way-whether through spoken or textual inputs-needs to have natural language processing.

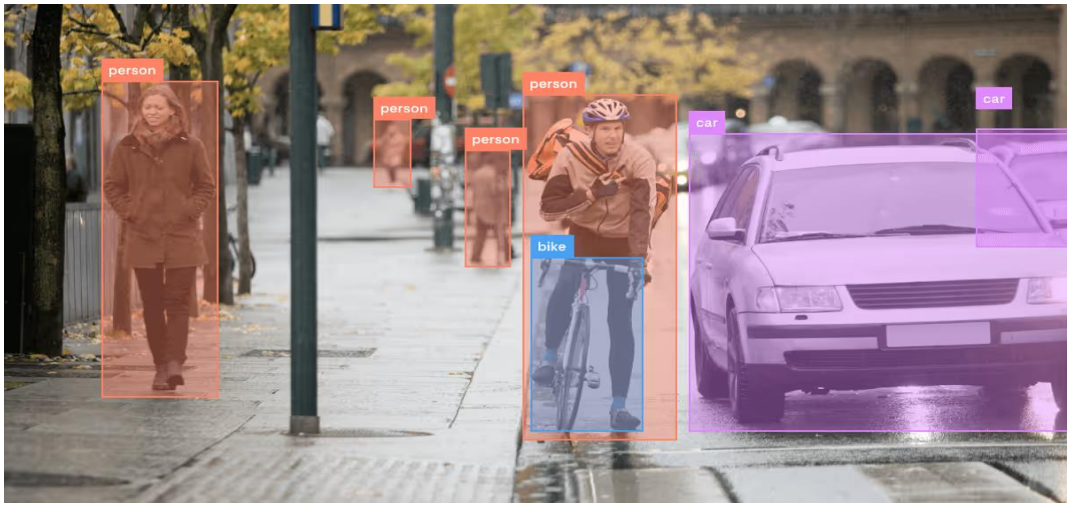
**2.4.5 Computer Vision** the ability to review and interpret image content through deep learning and pattern recognition. The former allows AI systems to recognize different components of visual data, such as pictures, videos…..etc. CV aims to manage classification tasks and takes appropriate actions based on them, similarly to how human visual system works. (Malan, Kuperholz, & Sriskandarajah, 2020, p. 5)

**2.4.6 Cognitive Computing** is another significant component of AI systems designed to simulate human-machine interactions, allowing computer models to mimic how a human brain

works when completing a challenging task, such as processing text, speech, or images (Yasar, Gillis, & Botelho, 2023)

Figure 2.2

*Computer Vision Object Classification*




Note. Image showing object detection labels for persons, bikes, and cars. From "Getting Started with Object Detection," by Label Studio, 2023 (https://labelstud.io/blog/getting-started-with-object-detection/). In the public domain.

As shown in the figure 2.2, how AI has used the component, computer vision, to recognize certain objects in the image, it even classifies the objects into categories, e.g., all persons are marked in red, cars in purple and bikes in blue.

## 2.5 Classification of Artificial Intelligence

It is possible to distinguish between weak AI and strong AI. The former is also known as specialized AI because it is focused on doing only certain activities and solving a specific problem. Examples include Alexa, Autopilot, Chatbots, and Spotify shuffle. Strong AI is considered as a theoretical concept for now – it often referred to as artificial general intelligence (AGI)-. It is capable of solving challenges it has never faced before in the same manner that humans can (Glover, 2024). Robots seen in movies is an AGI representation.

Depending on artificial intelligence capabilities, it can also be divided into four groups: reactive machines, theory of mind, limited memory, self-aware AI. The simplest and most basic kind of artificial intelligence are reactive machines. It have no memory and only carry out the precise functions for which they are programmed. The result will always be the same in the same situations. One example of reactive machine AI is the IBM Deep Blue chess program. Reactive AI served as the foundation for the development of limited memory, the second category (Coursera, 2023).

Limited memory is a type of AI that can increase its performance as it is qualified for more data. Unlike Reactive Machine, it can retrieve previous events and results and continuously track specific objects or situations. Limited Memory AI has the ability to use prior and current data to determine what actions it will perform to achieve the intended purpose. Self-driving cars for instance, monitor their surroundings, including the movements and speeds of other vehicles (IBM Data and AI Team, 2023).

While reactive machines and limited memory AI do exist, theories of mind and self-aware AI are yet to be developed. The goal of the theory of mind is to create a system capable of understanding thoughts and emotions and acting accordingly when interacting with a person. The purpose of the theory of mind is to model human relationships and how different objects interact with one another (Coursera, 2023).

Self-awareness is sort of AI that is yet unlikely to occur. Hypothetically, though, self-aware AI implies that the AI is aware of itself, can articulate its feelings and needs, and can forecast the sentiments or needs of others (Glover, 2024).

### 2.6 Artificial Intelligence in Education

Given the current size of artificial intelligence, it is only natural that it is now being incorporated into various fields, including education. There are significant benefits to be

gained, and major obstacles in education can be addressed, although there are also potential risks, which have been explored in more detail in the text. Opinions on the use of AI in education are divided, with some enthusiastic about the opportunities it offers while others are concerned about the potential dangers.

The University of Helsinki has released instructions on their website that encourage the use of artificial intelligence in teaching and learning. Course coordinators can decide how to employ artificial intelligence in their courses, but it cannot be used for maturity examinations. Teachers are permitted to use AI when designing tasks, but if an assignment is easily answered by AI, it should have little impact on the overall course grade. The instructions also contain strategies for deepening pupils' learning and instances of assignments that unlikely to be solved by AI. Teachers' responsibility is to guide students on how to do tasks using AI, such as not submitting a complete text generated by AI as their own work, which would be considered plagiarism. These guidelines mainly target language models like ChatGPT, Bard, DeepL, and others. It also notified that these language models usually cannot generate high-quality content on a highly specific subject. (University of Helsinki, 2023a; University of Helsinki, 2023b). The university is getting students and educators ready for the future of AI and enabling them to leverage it for their benefit.

There are numerous universities on the internet that support artificial intelligence, like the University of Helsinki mentioned above. Many schools are concerned about fraud and plagiarism, leading them to prohibit the use of ChatGPT unless students provide clear references when using an AI tool. Sciences Po, a prestigious university in France, has prohibited the use of ChatGPT and similar AI tools for writing without clear citation, except in cases of supervised assignments on a specific course. Failure to adhere to these rules and effectively demonstrate the application of an AI tool in a piece of writing can lead to being removed from the university, or possibly from all of French higher education (Sciences Po,

2023). With a model similar to Sciences Po, universities can guarantee that students do not cheat and are open about their use of AI technology in their coursework. This also shows students the correct way to cite references.

### 2.7 Artificial Intelligence Tools in Education and Their Usage

This chapter introduces various artificial intelligence tools that have applications in the field of education. Many tools that can aid students in their studies are available, yet they may be unaware of them.

First, 3AMK universities developed CareerBot for their students. 3AMK is a collaboration of Finland's three applied science universities: Haaga-Helia, Laurea, and Metropolia. CareerBot is a trained AI language model designed to assist students in creating skill profiles, searching for jobs, finding courses to acquire and improve abilities, and identifying themes for their research or thesis. Students can use the skills profile tool to establish profiles based on their present abilities, reskilling needs, and desired future skills. The current skill profile can be created by using a current CV or the courses taken at 3AMK. Students can then use their current skill profile to search for job ads on the platform. They can also identify what talents are lacking in their desired profession and what skills need to be developed. It is then possible to search among 3AMK's course offerings for a course that teaches the missing ability. CareerBot allows you to search for themes for your thesis or research and see trends in these keywords (3AMK s.a.). CareerBot is a beneficial tool for students' career and study planning.

ChatGPT, a tool for natural language processing, was created by OpenAI and was officially launched in November 2022. The tool functions similar to a chatbot, producing text using input from the user. It was created to provide smart answers to whatever the user types or queries. In only sixty days since its release, the tool has reached 100 million users. Sometimes, the tool can become fully occupied by users, causing delays in your ability to access it. Even though ChatGPT is available for free, they have also introduced a paid version costing 20 dollars

monthly. This subscription enables access to the tool even when the user limit is reached and provides a quicker response time (Halaweh, 2023, p. 1).

Halaweh (2023) claimed that this technology has the potential to revolutionize various activities in educational settings, such as searching for information, answering specific questions, inquiring about any topic, engaging in open conversations and discussions, writing and editing reports and essays, generating software codes, providing tutoring by explaining codes, providing samples of data for databases and analysis, and solving mathematical calculations and statistical analysis, as well as translating texts to other languages (p. 1). ChatGPT clearly has a wide range of educational applications. Bing AI chat is a similar application that can serve the same educational aims.

Course Hero has developed a paraphrasing tool called QuillBot, which uses AI to improve writing in a variety of ways. It is free; however, there is a paid version with more features. The instrument allows you to alter your written content based on your choices. The language and grammar can be improved, the content can be made more formal or simpler, and it can be creatively adjusted to be longer or shorter. QuillBot improves vocabulary, tone, fluency, and style. It can also adjust to different English dialects. The user can look for synonyms for any word and use a plagiarism checker, translator, and citation tools (QuillBot, 2023). QuillBot is capable of producing high-quality text. It is similar to the popular AI-powered Grammarly tool. Both tools can benefit students greatly while also teaching them new synonyms, grammar, and sentence rephrasing techniques.

Speechify, is one of AI powered text-to-speech program. It is a beneficial and accessible tool that can be helpful for students with disorders like dyslexia or visual impairment. It is a wonderful resource for auditory learners, which improves their learning experience and outcomes. A text-to-speech tool might be useful when learning a new language since it pronounces the words. When re-reading your own work for instance, it is often easy to skip

mistakes; nevertheless, by letting Speechify read the text while listening to it out loud increases the ability of spotting flaws such as poor text flow. Using this tool allows multitasking, as you can listen to study material while taking notes (Weitzman, 2022).

The reverse of text-to-speech is speech-to-text. Speechnotes, Google, and Apple's built-in dictation on all their devices also provide speech-to-text, which is similar to text-to-speech and identifies the audio and converts it into written text. This is helpful in transcribing lectures. Using speech-to-text, students with hearing difficulties, at times when non-native speakers are unable to comprehend everything spoken, or when students are experiencing difficulties in taking notes. Furthermore, during a research or thesis interview, students can use the speech-to-text function and transcribe the entire interview afterwards, saving a lot of time that would have gone into manual transcription. Additionally, speech-to-text can be used to generate subtitles for videos, check pronunciation skills when learning a new language, and generate content for essays or reports (Doty, 2022).

GitHub Copilot is a useful tool, particularly for students learning programming. This resource is free to use after signing up as a student or a teacher. GitHub Copilot is an AI pair programmer. It will auto-complete comments and code when you start typing or create codes. It can even write what you would like to program, or write it down for you. The best is that the tool acknowledges the error messages that come up, provides a detailed explanation to the user, and informs them of how to fix the bugs (Dohmke, 2023).

Using AI image generator tools can be advantageous for graphic design students. Image generators have the ability to produce a stunning image by using a text description given by the user. A wide variety of tools are available, such as Picsart's image generator or OpenAI's DALL·E 2 (Castos, n.d.). For instance, teachers can use DALL-E 2 for interactive activities like image guessing games. They put an idiom or words to generate images then asks the students to make guesses based on the visual representations.

Synthesia is a tool for generating videos that is capable of producing professional videos using the text-to-video feature without the user needing to have any video editing skills. Videos can be made in 120 languages, with a selection of more than 125 avatars available and the option to replicate your own voice (Synthesia, 2023). Synthesia is simply one of many video creation tools available online. These tools are suitable, for example, for completing course assignments and creating presentations. Teachers can also utilize the tool to create course materials.

Moreover, the DeepL AI translator can provide high-quality translations of text in 31 different languages. DeepL is able to translate entire PDF, Word, and PowerPoint documents as well. The tool is available for use either online on their website or by downloading it to any device. Limitations exist on monthly translation amounts when using the tool's free version, with various subscription options available for selection. DeepL has recently launched a beta version of DeepL Write, offering grammar, punctuation, and rephrasing features. (DeepL s.a.) DeepL is a possible replacement for Google Translate.

Furthermore, Google introduced recently their language model, known as PaLM 2 in May 2023. This advanced model excels, in capabilities, reasoning skills and coding abilities. It is integrated into tools like Google Bard to enhance language functions and coding tasks. Additionally Med PaLM 2 a tool providing insights now utilizes this language model well (Ghahramani, 2023). The enhancements of PaLM 2 make Google Bard a valuable resource, for students learning to code. Furthermore, healthcare students can benefit from the Med PaLM 2 tool by obtaining answers to inquiries.

There are other resources available to students for educational purposes include various AI tools for productivity, organization, and music generation.

## 2.8 Advantages Vs Disadvantages of Artificial Intelligence in Education

The integration of AI in education brings both benefits and risks. While AI enhances engagement, personalizes learning, and provides valuable insights, concerns arise regarding data privacy, ethical considerations, and the potential impact on human interaction in the educational process.

### 2.8.1 Advantages of Artificial Intelligence in Education:

Benefits of AI Integration in education includes Personalized Learning, Enhanced Productivity Enhanced Engagement, Accessibility and Bilingual Education.

Personalized education is an excellent characteristic, as it identifies the specific area in which a student requires assistance and provides support in various ways. Teachers frequently do not have enough time for this task, so the AI assists teachers by catering to individual student needs and enhancing student learning efficiency. The next focus, enhanced productivity, involves backing teachers and students. Through administrative task automation, teachers are able to give more time to assisting students, allowing them to concentrate more deeply on the instruction and students interactions. AI systems designed to boost student engagement and retention by catering to their interests and specific requirements can be a source of motivation for them, as they are able to learn while engaging in activities they find enjoyable. For example, students can use virtual reality (VR) platform to explore virtually Ancient Greek life. Accessibility is crucial for students with disabilities or special needs, as well as for those who require a different approach to learning. AI-powered virtual tutors can offer beneficial customized learning solutions for them, for example, there are AI systems like text-to-speech that enhance education accessibility. The final point is related to Language barriers, which is often a significant obstacle in education, are also addressed through AI-driven translation tools. These tools facilitate communication and collaboration among students and educators from

different countries or linguistic backgrounds, promoting a more inclusive and diverse learning environment (Bojorquez & Martínez Vega, 2023).

In addition to these benefits, there are few more that are worth noting. Students can use artificial intelligence to get answers directly to their questions and receive assistance with their tasks, without the need to wait days for a response. This is a benefit for introvert students as well as for pupils who worry that their question is going to be criticized. This conserves students and educators time and enhances the efficiency of the learning process. There are even AI tutoring systems that assist students during their learning process and provide feedback. AI has the capability to provide immediate feedback, which can enhance learning while the topic is still in the learner's memory. To enhance the mentioned engagement, augmented and virtual reality can be used to do course tasks that are implemented in a virtual reality setting (Hooper, 2023). Artificial intelligence can also make it easier to find different information, summarize long texts, check spelling, and check plagiarism.

### 2.8.2 Disadvantages of Artificial Intelligence in Education

Although Artificial Intelligence (AI) has brought significant benefits in the education sector, yet it also come with a set of disadvantages.

**A-Dependence on technology:** In extreme cases, pupils may lose their critical thinking and problem-solving skills, therefore becoming more dependent on technology-based student outputs. Furthermore, students learning experiences may be affected if the technology malfunctions (Alimen, 2023). For instance, a student who uses AI to solve mathematical problems instantly will become so reliant on technology that when facing a simple equation in an exam or even in real life, he struggles to figure it out on his own. Therefore, problem-solving skills become affected.

**B-Potential for bias:** AI systems unconsciously transfer biases contained in the training datasets, which consequently leads to bias and discrimination in education. Biases, such as

ethnicity or gender, can shape AI judgments regarding pupils while inadequately controlled and filtered sample data can misdirect learners or make incorrect predictions (Annus, 2023, p. 3). For example, an AI system could wrongfully choose a female student over a male student due to the trained algorithms on historical admissions data where female students perform academically better than male students.

**C-Privacy concerns:** Annus stated that in education, the use of AI systems may incorporate monitoring and analyzing both teachers 'and students' data. If the data is not secured and stored appropriately, this can violate their privacy as well as promote ethical concerns (2023, p. 3).

**D-Cost of implementation:** bringing Artificial Intelligence to education require huge amount of financial support in terms of installation, maintenance and repair costs that can limit the access to new technologies by those with low resources (Sawant & Vaghela, 2022). For example, buying AI-powered tutoring software may be too expensive for schools in financially disadvantaged areas.

**E-Teacher and student resistance:** Such resistance to or discomfort with technology amongst instructors and students can put a huge brake on the emergence of AI as an effective facilitator of education. To be able to properly integrate AI tools into the classroom, the educators have to carry out the educational process and for that the educators have to be given enough training (eSchool news, 2024). For example, if teachers are not properly prepared to use AI technologies, they may reject incorporating them into lesson plans, limiting students' exposure to helpful technology

### 2.9 Ethics of Artificial Intelligence for Educational Purposes

Ethical considerations are important in the use of artificial intelligence in educational settings. The utilization of AI poses various potential dangers, some of which are outlined below.

The greatest ethical issue with artificial intelligence is likely privacy. Privacy breaches commonly occur when an excessive amount of personal information is revealed on the internet. Despite the existence of laws and regulations aimed at safeguarding personal data, individuals remain apprehensive because of AI-driven technology companies that have breached these regulations. In order to address these concerns, the AI systems request permission to retrieve personal data. The problem is that numerous individuals share their personal data with AI systems without being aware of the extent of the information being shared. When a student must use an AI system for their education, they have no option but to agree to the system accessing their personal information (Akgun & Greenhow, 2022). The use of artificial intelligence tools in a course may be mandatory, posing an issue as students are not given the option to decide whether they want to disclose personal information. In this situation, there may arise a problem with uneven treatment for all individuals or a student receiving a lower grade because they did not complete the necessary coursework.

Surveillance poses another ethical issue. It refers to the ability of the system to follow user's activities and preferences and forecast future actions and choices. Monitoring student actions to ensure that nothing dangerous occurs, such as cyberbullying, can be beneficial, but it has an impact on the student's privacy. Surveillance of students online can make them feel insecure, hindering their willingness to express their ideas, and limiting their engagement in activities. The prediction of the user's future behaviors and choices is also related to autonomy concerns. This indicates that the student or the teacher has less freedom to make their own decisions, which may threaten their autonomy. There is also a danger that the forecast may perpetuate the user's existing biases and prejudice (Akgun & Greenhow, 2022). The predictive function can passively affect individuals' autonomy concerning independency in making decisions.

Furthermore, bias and discrimination are included in the list of risks. Machine learning models within artificial intelligence systems may have biases and discrimination. Using an AI

translator between two languages with differing levels of gender specificity can bring up gender bias as a prominent issue. For example, it has the ability to change ‘she is a doctor' to 'he is a doctor' when translating to a different language. Additionally, the potential danger of racial prejudice exists (Akgun & Greenhow, 2022). If the AI system incorporates biased or discriminatory data, it may result in biased AI, and decisions made using this data may be flawed.

Additional ethical risk when using an AI tool is reliability of the information. Utilizing ChatGPT for example provides information from the chatbot, but the used sources, the genuineness of the information, whether it contains potential bias, or if it is up to date remain unknown. This could lead to a significant issue if a student grasps and employs inaccurate information (Open AI, 2023; Zhuo et al., 2023; Tajik, 2024). A teacher faces a potential risk when using artificial intelligence to create course material without conducting quality checks. The information might be unreliable or unethical. The educational institution needs to establish guidelines for teachers to avoid the falsification that can be generated by AI (Williams, 2024).

**2.10 Personalized Learning with AI**

Personalized learning is a student centered educational approach where content, pacing and assessment are tailored according to students’ needs rather than applying the traditional one-size-fits-all model. It emphasizes flexibility, adaptability, and student agency, creating a dynamic educational environment.

At the outset lies adaptive content, which is a key aspect of personalized learning. In the era of artificial intelligence, AI algorithms play a crucial role in its delivery. They process large datasets, including students' performance, engagement patterns, and preferences, to adjust instructional materials' difficulty and format. AI constantly follows individual progress, ensuring that the content matches learners’ proficiency levels, preventing boredom and

frustration, and promoting suitable learning conditions (Ayeni et al., 2024; Anis, 2023; Khonturaev, 2023; Tapalova & Zhiyenbayeva, 2022).

In addition to adaptive content, in PL, AI-powered feedback provide considerable support in enhancing the learning results. AI provides immediate, specific feedback on students' work, helping them correct errors. This instant feedback also help educators to modify their teaching strategies to meet individual and group needs, fostering a continuous cycle of improvement (Ayeni et al., 2024).

Moreover, intelligent tutoring systems (ITS) are an advanced AI application in personalized learning that tries to imitate human tutors. They use algorithms to provide tailored feedback, coaching, and tools to support different learning styles. Intelligent tutoring systems effectively address learning gaps, reinforce concepts, and adjust to individual student needs (Ayeni et al., 2024; Akyuz, 2020; Conati, et. al., 2021; Kim & Kim, 2020).

AI incorporation into personalized learning has substantially enhanced student performance and academic achievement. According to studies, individualized learning not only improves students' involvement, but also motivation, and comprehension of the subject. AI algorithms that automatically transmit content improve memorization and comprehension, resulting in greater academic performance. This approach also enables students to manage their learning hence promoting self-efficacy and autonomy (Ayeni et al., 2024).

Another advantage of implementing AI for personalized learning is that it goes a long way in addressing the learners' differences with ease. Effective teaching in a traditional classroom can at times be challenging to achieve due to the diverse learning abilities of the learners. However, with the use of technology specifically, Artificial Intelligence based platforms, several modes of instruction can be provided in one single learning process including the visual, auditory, and the kinesthetic. This versatility helps the students to follow various approaches

that suits their learning styles which in turn improves the learning environment for all (Ayeni et al., 2024; Kabudi, Pappas, & Olsen, 2021; Luan & Tsai, 2021; Regan & Jesse, 2019).

In conclusion, personalized learning with the help of AI in the field of education is a revolution, which not only influences the processes of the acquiring and transfer of knowledge. Thus, it promotes achievement and tackles different educational requirements due to flexibility, adaptability, and students' agency. AI - personalized learning integration as technology advances has the potential to reshape education by developing inclusive and flexible learning environments that prepare students for potential challenges (Ayeni et al., 2024).

## Conclusion

In conclusion, the integration of technology, a long-debated topic among educators, has made significant progress in recent years. In particular, AI is a front-leader in the wave of innovative technologies that affect generally most of education spheres. The present chapter covered the basics of AI, overviewing its emergence, explaining how it works, showing how it is distributed in various domains, and how it is classified. Moreover, it has examined the role of AI in education; identifying its tools and uses, measuring its advantages and disadvantages, and considering the moral issues concerning its integration. The exploration of AI in the present chapter sheds light on its role as promoter for personalized learning.

## CHAPTER THREE

## Field Investigation

**Content**

## Introduction

The present chapter is devoted to the analysis and interpretation of both teachers' and students' questionnaires. The questionnaires aims at investigating their attitudes towards personalized learning approach in the era of AI .The data collected throughout this chapter will be analyzed and interpreted.

### 3.1. Teachers' Questionnaire

The questionnaire is a data collection tool or an instrument consists of a series of questions that can gather quantitative and/or qualitative information (Bhandari, 2021). It provides a systematic and structured model of data collection that can help researchers study trends, assess obstacles, and contribute to decision-making processes. In this research, a questionnaire is used to capture teachers' perspectives towards PL in AI era and to come up with possible pedagogical suggestions on how educational institutions can effectively adopt and integrate personalized learning with AI technology. It is designed to answer the research questions and to meet the research goal.

#### 3.1.1. Population and Sampling

The population of this research consists of 19 First -Year Master teachers of English at Guelma University. Participants of this questionnaire are 13 teachers who were randomly selected and answered the questionnaire. The majority of participants in this questionnaire are females.

#### 3.1.2. Administration of the Questionnaire

The questionnaire has been administered to Master one teachers in Guelma University during the second semester of the academic year 2023-2024. The nineteen (19) copies were distributed to teachers at English department. The process took about 4 days. Most teachers

were very interested in the topic and answered back our questionnaire immediately; whereas, few teachers did not respond to our request.

### 3.1.3. Description of the Questionnaire

This questionnaire aims at investigating teachers' attitudes toward personalized learning in the artificial intelligence era. The questionnaire is divided into four sections that contain two types of questions, closed questions where teachers are asked to choose the appropriate answer or all that apply, and yes or no questions. The first section of this questionnaire contains general information about teachers. The second section is concerned with Personalized Learning. Moreover, the third section is devoted to Artificial Intelligence, and the last section is dedicated to personalized learning in the era of AI.

Section one is related to teachers' general information. It contains two main questions (Q1, Q2) which aim at giving an idea about the teachers' gender and how long they have been teaching English.

Section two is devoted to investigate teachers' experiences with personalized learning. It consists of four questions from three to six (Q3 to Q6), teachers are asked to identify their familiarity, views, techniques as well as the challenges concerning PL approach.

Section three includes two questions (Q7to Q8) which are devoted to AI integration in education .Teachers are asked to identify their familiarity with the term and whether they have implemented an AI-powered educational tools while teaching.

Section four consists of four questions (Q9 to Q12). Teachers in this section are expected to provide the researchers with some effective techniques that can be possible to use by educational institutions concerning AI-powered personalized learning.

### 3.1.4. Analysis of the Results

**Section One: General Information**

**Question One:** Gender?

Table 3.1

*Teachers' Gender*

| | Number | Percentage (%) |
|---|---|---|
| Female | 9 | 69, 23% |
| Male | 4 | 30, 76% |
| Total | 13 | 100% |

The results show that most of the teachers who answered back our questionnaire are females. There are (69, 23%) females and only a percentage of (30, 76%) are males.

**Question Two:** How long have you been teaching English?

Table 3.2

*Teachers' Teaching Experience*

| | Number | Percentage (%) |
|---|---|---|
| Less than 5 years | 1 | 7, 69 % |
| 5-10 | 1 | 7, 69 % |
| More than 10 years | 11 | 84, 61% |
| Total | 13 | 100% |

The results shown above clearly state that, most EFL teachers are highly experienced educators. (84, 61%) of the teachers have been teaching for more than 10 years and this will help us to gather data that are more reliable.

**Section Two: Personalized Learning**

**Question Three:** On a scale of 1 to 5, how familiar are you with the concept of personalized learning?

Table 3.3

*Familiarity with Personalized Learning*

| | Number | Percentage (%) |
|---|---|---|
| 1 (Not familiar at all) | 0 | 0% |
| 2 | 2 | 15, 38% |
| 3 | 3 | 23, 07% |
| 4 | 7 | 53, 84% |
| 5 (Very familiar) | 1 | 7, 69% |
| Total | 13 | 100% |

The table above indicates that the majority of the teachers (53, 84%) are familiar with the term personalized learning, rating it 4 on a scale of 1 to 5. At level 3 which represents moderate familiarity were selected by notable respondents (23, 07%), while (15.38%) have limited knowledge at level 2. Only a small percentage (7.69%) consider themselves very familiar with personalized learning, rating it at level 5. No respondents rated themselves as not familiar at all. This mainly indicates that all teachers have at least some knowledge about the term-personalized learning.

**Question Four:** What are your general attitudes towards personalized learning? (Why?)

Table 3.4

*Teachers' Attitudes towards Personalized Learning*

| | Number | Percentage (%) |
|---|---|---|
| Very positive | 1 | 7, 69% |
| Positive | 9 | 69, 23% |
| Neutral | 3 | 23, 07% |
| Negative | 0 | 0% |
| Very negative | 0 | 0% |
| Total | 13 | 100% |

The shown results in table 4 implies that most of the teachers have a positive attitude towards personalized learning. Precisely, (69.23%) of respondents have a positive attitude, (7.69%) expressed a very positive attitude and notable (23.07%) of teachers maintained neutral, while no respondents indicated a negative or a very negative attitudes.

**Why?** The majority of the teachers (10) with (76.92%) view personalized learning approach positively citing its benefits. The mentioned benefits include suitability for individual preferences and needs, enhancement of both autonomy and responsibility, and being crucial for advanced learners. Yet, (23.07%) maintained neutral pointing out significant challenges including difficulties concerning implementation in crowded classes ,lack of social interaction, equity concerns and tiredness for teachers .

The overall analysis implies that the majority of teachers have a general acceptance and approval towards personalized learning due to its benefits and alignment with modern educational goals, with a significant number viewing it positively and none opposing it. However, there is a need to address its potential challenges for effective implementation.

**Question Five:** Which personalized learning techniques do you currently use in your classroom? (Select all that apply)

Table 3.5

*Personalized Learning Techniques*

| | Number | Percentage (%) |
|---|---|---|
| a) Differentiated instruction | 1 | 7.69% |
| b) Project-based learning | 2 | 15.38% |
| c) Flipped classroom | 0 | 0% |
| d) Individual learning plans | 0 | 0% |
| e) Others | 0 | 0% |
| a and b | 3 | 23.07% |
| a and c | 2 | 15.38% |
| a and d | 1 | 7.69% |
| a and c and d | 1 | 7.69% |
| a and e | 1 | 7.69% |
| b and c | 1 | 7.69% |
| c and d | 1 | 7.69% |

| | | |
|---|---|---|
| Total | 13 | 100% |

The previous results denotes diverse use of personalized learning techniques among teachers, with differentiated instruction being the most commonly used method, either alone or combined with others. Specifically, (23.07%) of respondents integrate differentiated instruction with project-based learning, while (15.38%) pair it with the flipped classroom approach. Project-based learning is also frequently employed, both on its own (15.38%) and with other techniques. The flipped classroom and individual learning strategies are less commonly used individually but are sometimes incorporated with other methods. Additionally, one respondent (7.69%) added assessment and Q&A around topics alongside with differentiated instruction. This variety indicates that teachers are not reliant on a single approach but prefer to mix multiple techniques to tailor their teaching strategies to meet the diverse needs of their students successfully.

**Question Six:** What challenges do you face when implementing personalized learning in your classroom?

Quotes: "It is difficult to apply it with a large size group because of learners' different learning styles." (Anonymous).

"Time constraints & learners lack of cooperation and interest." (Anonymous).

"Resource constraints, time management issues, complexities in assessment, ensuring equity and accessibility for all students, large classes, the need for teacher training." (Anonymous).

Based on the illustrations teachers face multiple challenges in implementing personalized learning, with time constraints and large class sizes being the most relevant. Lack of resources and student-related issues further complicate the process. The complexity of personalized learning and the need for professional development are additional complications.

**Question seven:** How familiar are you with artificial intelligence in education?

Table 3.6

*Familiarity with Artificial Intelligence in Education*

| | Number | Percentage (%) |
|---|---|---|
| Not familiar at all | 0 | 0% |
| Somewhat familiar | 8 | 61.53% |
| Very familiar | 5 | 38.46% |
| Total | 13 | 100% |

The majority of teachers (61.53%) are somewhat familiar with the concept of artificial intelligence in education, indicating a general awareness. Meanwhile, (38.46%) of teachers are very familiar with AI, signifying interest and knowledge base within the teaching community about AI's applications in education.

**Question Eight:** Have you used any AI-powered educational tools or platforms in your teaching? (If yes, mention one)

Table 3.7

*Usage of AI-Powered Educational Tools or Platforms*

| | Number | Percentage (%) |
|---|---|---|
| a. Yes | 5 | 38.46% |
| b. No | 8 | 61.53% |
| Total | 13 | 100% |

The use of AI-powered educational tools among teachers is relatively limited, with (61.53%) of educators not having used any. Suggesting tendencies towards traditional method. However, (38.46%) of teachers have incorporated AI tools into their teaching such as Canva.com, Open AI, and QuillBot .This indicates that there is a segment of educators who are open concerning AI integration in education.

**Section Four: Personalized Learning in the AI era**

**Question Nine:** In what ways do you think AI can enhance personalized learning? (Select all that apply)

Table 3.8

*Ways for the AI That Can Enhance PL*

| | Number | Percentage (%) |
|---|---|---|
| a) Adapting content to individual student needs | 0 | 0% |
| b) Providing real-time feedback | 1 | 7.69% |
| c) Automating administrative tasks | 0 | 0% |
| d) Personalized tutoring | 0 | 0% |
| e) Other (Please mention) | 0 | 0% |
| a-b-c-d | 1 | 7.69% |
| a-b-c | 1 | 7.69% |
| a-b | 1 | 7.69% |
| a-d | 2 | 15.38% |
| a-b-d | 2 | 15.38% |

| | | |
|---|---|---|
| b-d | 4 | 30.76% |
| c-d | 1 | 7.69% |
| Total | 13 | 100% |

The above table indicates that (30.76%) of teachers believe that through real-time feedback and personalized tutoring, AI can significantly enhance personalized learning, as these options are frequently selected in combination with others.

**Question Ten:** What concerns do you have about the use of AI in education? (Select all that apply)

Table 3.9

*Concerns about AI Use in Education*

| | Number | Percentage (%) |
|---|---|---|
| a) Privacy issues | 0 | 0% |
| b) Equity and access concerns | 0 | 0% |
| c) Loss of human touch in teaching | 3 | 23.07% |
| d) Job displacement for teachers | 1 | 7.69% |
| e) Other | 2 | 15.38% |
| a-b-c-e | 1 | 7.69% |
| a-c | 1 | 7.69% |
| a-c-d | 1 | 7.69% |
| b-c-d | 2 | 15.38% |

| | | |
|---|---|---|
| b-c | 1 | 7.69% |
| c-d | 1 | 7.69% |
| Total | 13 | 100% |

From the results obtained in the previous table, it reveals clearly that the most significant concern among teachers regarding the use of AI in education is the loss of human touch in teaching, with (23.07%). This reflects a fear that AI might reduce essential personal interactions between teachers and students. Other concerns include job displacement for teachers (7.69%) and equity and access issues (7.69%). In addition, (15.38%) mentioned other concerns such as ethical considerations and the impact on the quality of education, indicating broader worries about AI's role in the educational landscape. These findings highlight the need to address these concerns for effective AI integration in education.

**Question Eleven:** What challenges do you foresee in implementing personalized learning in the era of artificial intelligence?

Table 3.10

*Challenges of Personalized Learning Implementation in AI Era*

| | Number | Percentage (%) |
|---|---|---|
| a) Lack of resources | 0 | 0% |
| b) Technological barriers | 0 | 0% |
| c) Ethical concerns | 0 | 0% |
| d) Resistance from stakeholders | 0 | 0% |
| e) Other (please specify) | 0 | 0% |

| | | |
|---|---|---|
| a-b-c-d | 1 | 7.69% |
| a-b-c | 6 | 46.15% |
| a-c | 1 | 7.69% |
| a-d | 1 | 7.69% |
| b-c-d | 1 | 7.69% |
| b-c | 1 | 7.69% |
| c-d | 2 | 15.38% |
| Total | 13 | 100% |

(46.15%) of teachers foresee several challenges in implementing personalized learning with AI. The most significant combination include lack of resources, technological barriers, and ethical concerns. This implies that a tailored approach is needed to address these obstacles, including financial support for the technology, training for teachers, and addressing ethical problems to support the effective integration of AI in personalized learning.

**Question Twelve:** How can educational institutions effectively adopt personalized learning in the era of AI?

Table 3.11

*Techniques for Educational Institutions on How to Adopt Effectively PL in AI-Era*

| | Number | Percentage (%) |
|---|---|---|
| a) Differentiated instruction | 0 | 0% |
| b) Project-based learning | 3 | 23.07% |
| c) Flipped classroom | 0 | 0% |

| | | |
|---|---|---|
| d) Individual learning plans | 0 | 0% |
| e) Others | 0 | 0% |
| a and b and c and d | 2 | 15.38% |
| a and b and c | 3 | 23.07% |
| a and b | 1 | 7.69% |
| a and c | 2 | 15.38% |
| a and c and d | 2 | 15.38% |
| Total | 13 | 100% |

Results in table 3.11 indicates that (23.07%) of teachers leverage project-based learning. Therefore, educational institutions can effectively adopt it as a technique of personalized learning in the AI era. Furthermore, a multifaceted approach, integrating various personalized learning techniques, is preferred. This indicates that a combination of strategies, supported by resources, can address diverse student needs more effectively, facilitating the adoption of AI-enhanced personalized learning.

### 3.1.5. Interpretation of the Results

The results from the teachers' questionnaire provide a comprehensive understanding of their attitudes towards personalized learning and the integration of artificial intelligence (AI) in education.

The demographic data of the first section revealed that most of English teachers that answered back the questionnaire are females with a long period of teaching experience. This lends reliability to our findings.

Moving to section two, most of the teachers have a substantial understanding and a generally positive outlook towards PL approach. Although they appreciate its benefits, such as addressing student needs and enhancing autonomy, they also face significant challenges, particularly in implementation within large and diverse classrooms.

In practice, the use of different personalized learning techniques by teachers, including differentiated instruction and project-based learning, highlights the flexibility and adaptability of them in implementing PL in their classrooms, yet time constraints and resource limitations pose notable obstacles. These challenges suggest that teachers require more support and resources for effective implementation of personalized learning strategies.

Section three analysis implies that the majority of teachers are somewhat familiar with AI in education, suggesting a general awareness but also a need for a deeper understanding. The limited use of AI-powered tools highlights a tendency towards traditional teaching methods, or the exist of barriers such lack of access. However, a significant number of teachers have used platforms like Canva and OpenAI, showing openness towards AI integration and a willingness to embrace its potential benefits.

Teachers see considerable potential for AI to enhance personalized learning, particularly through real-time feedback and personalized tutoring. These capabilities can make personalized learning more responsive and tailored to each student needs. Nonetheless, concerns about the potential loss of the human touch in teaching, job displacement, and ethical issues, emphasize the need of careful implementation strategies that address these issues.

In embracement, the primary challenges in adopting AI-enhanced personalized learning include a lack of resources, technological barriers, and ethical concerns. Teachers foresee considerable obstacles in implementing these innovations without adequate support. For effective incorporate, a multifaceted approach is recommended. This approach should integrate

various techniques, such as project-based learning and differentiated instruction, supported by enough resources and professional development for teachers.

## 3.2 Students' Questionnaire

The questionnaire is a data collection tool or an instrument used to gather information and knowledge about EFL students' attitudes towards Personalized Learning in the Era of Artificial Intelligence. It is designed to answer the research questions and to meet the research goal.

### 3.2.1. Population and Sampling

The population of this research consists of 179 First - Year Master students for the academic year 2023-2024 at the University of 8 Mai 1945- Guelma. Participants of this questionnaire are 122 students who were randomly selected. However, only 100 questionnaires were answered back. Thus, the exact number of participants is one hundred (100). The questionnaire has been handed out and collected by the researchers. The majority of participants in this questionnaire are females.

### 3.2.2. Administration of the Questionnaire

The questionnaire has been administered to First - Year Master students at Guelma University during the second semester of the academic year 2023-2024. The one hundred and twenty-two (122) copies were distributed to First - Year Master EFL students in Guelma University and the process took about 9 days. Most students were interested in the topic and answered back our questionnaire immediately; whereas, few students did not respond to our request.

### 3.2.3. Description of the Questionnaire

This questionnaire aims at investigating students' perspectives towards the use of AI in PL. The questionnaire is divided into four sections which contain two types of questions, closed questions where students are asked to choose the appropriate answer, and yes or no questions. The first section of this questionnaire contains general information about students. The second

section is concerned with the use of Personalized Learning in EFL students' learning. Moreover, the third section is devoted to the students' information about Artificial Intelligence and the last section is dedicated to the Students' perspectives towards the use of AI in Personalized Learning.

Section one is related to students' gender and general information. It contains four main questions (Q1, Q2, Q3, Q4) which aim at giving an idea about the students and how long they have been studying English, their level in it, and level of motivation to study it.

Section two is devoted to investigate students' general background concerning the term "Personalized Learning". It consists of five questions (Q5 to Q9), students are asked to give their impression and views about PL.

Section three is about artificial intelligence and contains four questions from ten to thirteen (Q10 to Q13) mainly about its definition, usage, and role.

Section four consists of four questions (Q14 to Q17) students in this section are expected to provide the researchers with their perspectives towards the use of AI in PL. The questionnaire ends with an open question for further suggestions where students can add their comments and/or suggestions about the topic. When administering the questionnaire not all students answer it and few of them did not return it at all. However the conditions were good we did not face any other obstacles.

### 3.2.4. Analysis of the Results

**Section One: General Information**

**Question One:** What is your age?

**Table 3.12**

*Students' Age*

| | Number | Percentage (%) |
|---|---|---|
| 22 years | 57 | 57% |
| 23 years | 26 | 26% |
| 24 years | 17 | 17% |
| Total | 100 | 100% |

The first question asked about students' age; the results showed that students' age ranges between 22, 23 and 24 years old. The majority of them (57%) are 22 years old which is the expected age of Master I students. However, 26 (26%) students are 23 years old which means they have repeated a year or changed their field of study. Only (17%) o students are 24 years old which is over the expected age of Master I students. Age plays a significant role in the use of personalized learning in the era of AI, as it influences technological familiarity, learning preferences, and cognitive development.

**Question Two:** How many years have you been studying English?

**Table 3.13**

*Students' English Learning Background*

| | Number | Percentage (%) |
|---|---|---|
| 11 years | 71 | 71% |
| 12 years | 20 | 20% |
| 13 years | 09 | 09% |
| Total | 100 | 100% |

Students' English study background differed from one another. The majority of the informants (71%) have studied English for 11 years, (20%) have studied it for 10 years and finally, (09%) have studied it for 13 years. The results showed that our sample students are familiar with the English language and then can be said to master it to a certain degree. Their study average can be said to be 12 years.

**Question Three:** How do you consider your level of English?

**Table 3.14**

*Students' English Level*

| | Number | Percentage (%) |
|---|---|---|
| Beginner | 00 | 00% |
| Intermediate | 75 | 75% |
| Advanced | 25 | 25% |
| Total | 100 | 100% |

This question seeks to know students' English level. The results reported in Table 3.14, below have revealed that more than half of the participants (75%) claimed that they are intermediate English learners, while the remaining (25%) admitted that they are advanced. Consequently, the obtained results imply that the majority of the respondents have intermediate English level. All in all, participants that took part in the questionnaire have different levels in English, indicating that they have an excellent command of the language in addition to developing a good linguistic competence required for Master level in English.

**Question Four:** How is your motivation to study English?

**Table 3.15**

*Students' Motivation to Study English*

| | Number | Percentage (%) |
|---|---|---|
| Low | 00 | 00% |
| Average | 58 | 58% |
| High | 42 | 42% |
| Total | 100 | 100% |

According to Table 3.15, the majority of Master I students are motivated to study English, with 42% showing high motivation and 58% displaying average motivation. This indicates that nearly all students have some level of engagement with their English studies. However, there is still room for improvement, especially in increasing the percentage of highly motivated students.

**Section Two: The Use of Personalized Learning in EFL Students' Learning.**

**Question Five:** How familiar are you with the concept of Personalized Learning?

**Table 3.16**

*Students' Familiarity with the Concept of Personalized Learning*

| | Number | Percentage (%) |
|---|---|---|
| Not familiar at all | 13 | 13% |
| Somewhat familiar | 76 | 76% |
| Very familiar | 11 | 11% |
| Total | 13 | 100% |

Concerning the students' familiarity with the concept of Personalized Learning, the majority of the participants (76%) are somewhat familiar with the concept of PL. (13%) of students claimed that they are not familiar with this concept, whereas (11%) said they are very familiar. Consequently, the majority of the Master I students are familiar with the concept of PL.

**Question Six:** Have you ever participated in any personalized learning programs or platforms before?

**Table 3.17**

*Students' Experiences with PL Programs or Platforms*

| | Number | Percentage (%) |
|---|---|---|
| Yes | 77 | 77% |
| No | 23 | 23% |
| Total | 13 | 100% |

According to Table 3.17, the majority of students (77%) answered 'yes'; i.e. they have participated in PL programs. Whereas (23%) chose 'no' indicating that they have not participated in PL programs. This distribution suggests that a significant number of the student population has experience with PL programs, highlighting the widespread implementation and acceptance of these programs within their learning process. On the contrary, 23% of those who did not participate may indicate that they did not have the opportunity to participate or that they simply did not want to participate.

**Question Seven:** If yes, which of these personalized learning programs have you used before?

**Table 3.18**

*PL Programs Used by Students*

| | Number | Percentage (%) |
|---|---|---|
| Khan Academy | 4 | 5.19% |
| IXL learning | 0 | 00% |
| Duolingo | 72 | 93.51% |
| Other | 1 | 1.30% |
| Total | 100 | 100% |

As indicated in Table 3.18, the almost majority of students (93.51 %) used Duolingo to learn foreign languages. (5, 19%) said that they used Khan Academy; while only (1.30%) chosen other, specifically mentioning the "Talk to Me in Korean" program. This demonstrates Duolingo's dominance and popularity among students as a preferred tool for language personalized learning, indicating its perceived effectiveness. The lower use of Khan Academy and mention of an alternative program indicates a minority of students seeking diverse language learning resources.

**Question Eight:** Do you think that the use of Personalized Learning in EFL students' learning is useful?

**Table 3.19**

*Students' Perceptions towards the Use of PL in EFL Students' Learning*

| | Number | Percentage (%) |
|---|---|---|
| Yes, it is useful | 93 | 93% |
| No, it is not useful | 7 | 7% |

| | | |
|---|---|---|
| Total | 100 | 100% |

This results indicated that the vast majority of the participants (93%) claimed that they think the use of Personalized Learning in EFL students' learning is useful; whereas, (7%) answered 'no' and ensured that they do not think that the use of Personalized Learning in EFL students' learning is useful. This shows that the majority of Master I students are aware about the beneficial use of PL in learning EFL.

**Question Nine:** Do you agree that the use of Personalized Learning facilitates the learning of EFL?

**Table 3.20**

*The Role of PL in Facilitating the Learning of EFL*

| | Number | Percentage (%) |
|---|---|---|
| Strongly disagree | 0 | 0% |
| Disagree | 5 | 5% |
| Neither agree nor disagree | 26 | 26% |
| Agree | 61 | 61% |
| Strongly agree | 8 | 8% |
| Total | 100 | 100% |

From the analysis of this question, we can notice that more than half of the sample (61%) agreed that the use of PL facilitates the learning of EFL for them. This majority suggests a strong positive perception of PL's effectiveness in enhancing their EFL learning experience. (26%) neither agreed nor disagreed with this question, which indicates a level of ambivalence

or uncertainty about the impact of PL. (8%) of the sample strongly agreed, demonstrating a particularly high level of satisfaction and belief in the benefits of PL for learning EFL. Conversely, only (5%) of students disagreed, reflecting minimal opposition to the perceived role of PL in facilitating EFL learning. These responses underscore a generally positive attitude towards lifelong learning, while highlighting the need to address the ambivalence expressed by a significant minority.

**Question Ten:** How effective do you consider personalized learning in enhancing your learning experience?

**Table 3.21**

*Students' Perceptions about the Effectiveness of Personalized Learning in Enhancing the Learning Experience*

| | Number | Percentage (%) |
|---|---|---|
| Not effective | 7 | 7% |
| Moderately effective | 30 | 30% |
| Effective | 53 | 53% |
| Very effective | 10 | 10% |
| Total | 100 | 100% |

Concerning the effectiveness of PL in enhancing students' learning experience, (53%) believed that the use of PL is effective. (30%) of students claimed that it is moderately effective. (10%) declared that it is very effective, whereas (7%) said that it is not effective. These results suggest that a significant majority of students (93%) recognize some level of effectiveness in

PL, with varying degrees of perceived impact. This overall positive perception highlights the potential of PL in addressing individual learning needs.

**Section Three: Artificial Intelligence.**

**Question Eleven:** How would you define Artificial Intelligence in your own words?

Students' definitions of AI can be summed up as follows:

- The simulation of human intelligence by software coded heuristics.
- Electronic device used to provide answers for anything.
- Developed programs with a lot of data.
- AI is developed technology tool.
- AI is an advanced tool that facilitates life.

According to these definitions, one can say that each definition differs from the other one according to students' perceptions; it seems students have almost common key notions in their definitions of Artificial Intelligence; as being a developed technology tool, the simulation of human intelligence.

**Question Twelve:** Have you used any educational tools or platforms that incorporate artificial intelligence?

**Table 3.22**

*Students Usage of Educational Tools or Platforms that Incorporate AI*

| | Number | Percentage (%) |
|---|---|---|
| Yes, I did | 94 | 94% |
| No, I did not | 6 | 6% |
| Total | 100 | 100% |

As indicated in Table 3.22, the overwhelming majority of the participants (94%) answered ‘yes’; which means that they used educational tools or platforms that incorporate AI. This high percentage demonstrates a significant level of engagement with AI-driven educational technologies among the participants. However, just (6%) answered’ no’ and declared that they did not use any educational tools or platforms that incorporate AI. This suggests that despite the spread of AI technology, there are still some participants who have not yet interacted with these tools.

**Question Thirteen:** How do you consider the role of the artificial intelligence in the learning process?

**Table 3.23**

*Students’ Opinions about the Importance of AI in the Learning Process*

| | Number | Percentage (%) |
|---|---|---|
| Not important | 6 | 6% |
| Important | 36 | 36% |
| Very important | 58 | 58% |
| Total | 100 | 100% |

Concerning the importance of AI in the learning process, (58%) believed that it is very important. This importance lies in improving and facilitating their learning process, making it more efficient and personalized. (36%) of students claimed that it is important, indicating a strong recognition of its benefits, whereas (6%) declared that it is not important. Suggesting that while the vast majority sees value in AI, there remains a fraction of students who do not perceive it as beneficial to their learning experience.

**Question Fourteen:** How often do you use Artificial Intelligence in your studies?

**Table 3.24**

*The Frequency of Students' Use of AI for Studying*

| | Number | Percentage (%) |
|---|---|---|
| Not important | 6 | 6% |
| Important | 36 | 36% |
| Very important | 58 | 58% |
| Total | 100 | 100% |

As indicated in Table 3.24, the participants are asked to provide their frequency of using AI for studying. As it is noticed, (58%) of the participants sometimes use AI for studying, which indicates a moderate level of interaction with artificial intelligence technologies. While (36%) of participants often use it, demonstrating a higher frequency of reliance on AI tools for their academic work. By contrast to the previous answers, (6%) of the informants rarely or never use it for studying, suggesting that a small minority have minimal to no interaction with AI in their educational activities. This distribution highlights varying levels of adoption and integration of AI tools among the participants.

## Section Four: Students' perspectives towards the use of AI in Personalized Learning.

**Question Fifteen:** Do you think artificial intelligence could enhance personalized learning experiences?

**Table 3.25**

*Students' Views about the Role of AI in Enhancing PL Experiences*

| | Number | Percentage (%) |
|---|---|---|
| Yes | 96 | 96% |

| | | |
|---|---|---|
| NO | 4 | 4% |
| Total | 100 | 100% |

As shown in Table 3.25, the vast majority of the participants (96%) claimed that AI could enhance PL experiences. This high percentage signifies a widespread awareness among the participants of the powerful role of AI in improving and enriching learning experiences; whereas, only (6%) declared that AI could not enhance PL experiences. This minority viewpoint suggests that while nearly all participants recognize the benefits of AI, there are still a few who remain unconvinced of its potential impact on personalized learning.

**Question Sixteen:** Do you agree that personalized learning with AI technologies is more effective than traditional classroom instruction?

**Table 3.26**

*Students' Opinions about the Effectiveness of PL with AI technologies Compared to Traditional Classroom Instruction*

| | Number | Percentage (%) |
|---|---|---|
| Strongly disagree | 3 | 3% |
| Disagree | 11 | 11% |
| Neither agree nor disagree | 20 | 20% |
| Agree | 38 | 38% |
| Strongly agree | 28 | 28% |
| Total | 100 | 100% |

The results observed in Table 3.26, indicated a general trend towards acceptance and approval of PL with AI technologies among Master 1 students. With 66% expressing positive

sentiments, it suggests that AI technologies in personalized learning are seen as beneficial by the majority. However, the presence of 20% neutrality and a smaller fraction expressing negative views, suggests that there is room for further investigation and education on the benefits and effectiveness of AI in learning.

**Question Seventeen:** Would you be open to trying personalized learning aided by AI technologies?

**Table3.27**

*Students' Openness to Try Personalized Learning Aided by AI Technologies*

| | Number | Percentage (%) |
|---|---|---|
| Yes | 87 | 87% |
| NO | 13 | 13% |
| Total | 100 | 100% |

Concerning the openness to try Personalized Learning Aided by AI Technologies, the overwhelming majority of the participants (87%) answered 'yes'; indicating a strong willingness to embrace this innovative approach to learning. t This suggests that students are aware about the potential benefits that such technologies could offer, such as tailored learning experiences, improved engagement, and enhanced learning outcomes. While (13%) said that they are not ready to try it, this shows that there are some concerns or barriers to acceptance among a minority of students. For example, there are concerns that AI-based learning may reduce opportunities for personal interaction with teachers and peers or fears that over-reliance on AI might hinder the development of independent learning skills.

**Question Eighteen:** How satisfied or dissatisfied you are about the use of AI on EFL students' Personalized Learning?

**Table 3.28**

*Students' Level of Satisfaction about the Use of AI on EFL Students' PL*

| | Number | Percentage (%) |
|---|---|---|
| Very dissatisfied | 0 | 0% |
| Dissatisfied | 3 | 3% |
| Neither satisfied nor dissatisfied | 59 | 59% |
| Satisfied | 33 | 33% |
| Very satisfied | 5 | 5% |
| Total | 100 | 100% |

As shown in table 3.28, there is a significant level of satisfaction (38%) with the use of AI in personalized learning among Master 1 students, the majority of students (59%) are neutral, and small minorities (3%) are dissatisfied. This highlights the potential for further improvement and better communication of the benefits of AI in personalized learning to enhance overall student satisfaction.

**Question Nineteen:** Further suggestions

Only 6 students (6%) added suggestions and comments which can be summed up as follows:

- I think we need to apply personalized learning as soon as possible for better learning.
- I believe that this e right time to change the traditional classroom instruction with new ones.

- I think that AI can make every learning process better.
- I use ChatGPT and it is very useful but I did not use PL but I think it is worth to try it.
- I think if we really use PL we will be able to know more about ourselves and our goals.
- I see that if we change the traditional classroom instructions with new ones no one will be unmotivated to learn.

It seems from the above suggestions that students are aware of the importance of artificial intelligence and personalized learning and the role they can play in improving their learning process.

### 3.2.5. Summary of Results and Findings.

The analysis of the first section of the students' questionnaire reveals that the sampled students exhibit age variation, indicating their diverse perspectives and experiences regarding the personalized learning approach. The second and third questions revealed that although most students had studied English for over twelve years, they rated their proficiency level as intermediate. The results of the fourth question showed that sample students displayed average motivation to learn EFL, with a notable proportion exhibiting high motivation. This distribution underscores the importance of exploring factors influencing motivation levels and their impact on language learning outcomes within the research framework.

The second section of the questionnaire aimed to explore the students' perspectives on the use of personalized learning (PL) in EFL students' learning. The analysis revealed that the sample students had a significant level of familiarity with the concept of "personalized learning" among the majority of respondents, indicating a promising foundation for further investigation into its implementation and efficacy. Moreover, the prevalence of participation in personalized learning programs, notably Duolingo, suggests a tangible interest and utilization of such platforms within the student population. Furthermore, the overwhelmingly positive perception of personalized learning's benefits underscores its perceived effectiveness

in augmenting and streamlining EFL learning processes, affirming its relevance and potential as an educational tool within the context of language acquisition.

The third section of the questionnaire focused on gaining insights about students' views about artificial intelligence (AI).Students reported that they had a unanimous understanding regarding AI, conceptualizing it as a sophisticated technological tool aimed at enhancing daily life. Moreover, students confirmed their utilization of AI-driven educational technologies, recognizing AI's pivotal role in augmenting their learning journey. While some students occasionally integrated AI into their studies, others frequently leverage AI tools, indicating varying degrees of engagement with AI-enhanced learning methodologies. These insights underscore the significance of educators investigating students' perceptions and utilization patterns of AI in education, paving the way for tailored interventions to optimize learning experiences.

The fourth section of the questionnaire entitled: 'Students' perspectives towards the use of AI in Personalized Learning'. The participants emphasized in the potential of AI to enhance personalized learning (PL) experiences, highlighting its perceived efficiency compared to traditional classroom instruction. This recognition underscores the acknowledgment of AI's capacity to optimize educational outcomes through tailored learning approaches. Furthermore, the overwhelming majority of participants express openness to engaging with personalized learning aided by AI technologies, reflecting an awareness of the multifaceted benefits associated with this approach. These benefits encompass personalized learning experiences, heightened engagement, improved learning outcomes, enhanced flexibility, immediate feedback, and more effective progress tracking. However, students' satisfaction with the use of AI in personalized learning for EFL students appears neutral, reflecting a lack of implementation of AI-incorporated personalized learning in their current studies. This suggests

a need for further exploration and integration of AI technologies to better understand their potential impact on satisfaction levels and overall learning experiences.

Finally, students were asked to add any further comments or suggestions. To sum, the findings of this section suggest that first-year Master students recognize the significance of artificial intelligence and personalized learning in enhancing their educational experience. This awareness highlights a potential readiness among students to embrace innovative technologies and pedagogical approaches, underscoring the relevance of exploring further how these tools can be effectively integrated into educational practices to optimize learning outcomes. However, EFL teachers may encounter challenges in its implementation such as requiring sufficient budget allocation, training, and technological investment to effectively adopt and integrate AI-driven personalized learning methodologies. Hence, they need to be aware of the different ways to incorporate it effectively to suit their context and teaching practices. Consequently, the above results obtained from students' questionnaire analysis showed that students have positive attitudes towards AI-powered personalized learning.

In conclusion, the questionnaire findings offer a thorough understanding of both teachers' and students' attitudes towards personalized learning and AI integration. Teachers generally support personalized learning due to its benefits but also acknowledge facing substantial challenges in its implementation. Similarly, the analysis of students' responses indicates that they have positive attitudes towards AI-powered personalized learning. Together, these findings demonstrated a shared recognition of the potential advantages of AI in personalized education, despite the practical challenges involved.

## Conclusion

The field investigation chapter focuses entirely on the practical aspect of the investigated theme. The findings obtained from the research tools used in this study indicate a correlation between the use personalized learning (PL) and artificial intelligence. The analysis of the questionnaires clearly demonstrates that the majority of teachers and students, under investigation have a strong appreciation for AI-powered personalized learning and its various applications. This finding answers the research questions; that teachers and students have positive attitudes towards AI-powered personalized learning. Furthermore, both EFL teachers and students recognize the significant impact of AI-powered personalized learning on educational outcomes. This approach acknowledges the diversity in students' learning preferences and rejects the one-size-fits-all method of instruction. Notably, the study highlights that adaptive learning systems and intelligent tutoring are the most beneficial AI applications among EFL students. Consequently, it is recommended that AI-powered personalized learning be integrated into the EFL curriculum. By doing so, AI can customize learning experiences; address individual student needs, and enhance their engagement and proficiency in English. Interestingly, the results of the questionnaire analysis confirm the achievement of the aims set forth in the study.

# General Conclusion

## Concluding Remarks

This research aims to investigate teachers' and first-year Master students' attitudes towards AI-powered personalized learning at the Department of Letters and English Language, University 8 Mai 1945, Guelma. The study addresses the challenges faced by EFL teachers and learners, such as varying levels of engagement, difficulty in accessing personalized resources, resistance to new technology, anxiety and boredom, and the complexities of meeting diverse learning needs, which significantly impact overall language competence and academic success. The research thoroughly examines AI-powered personalized learning and its potential to enhance the EFL teaching and learning process in separate theoretical chapters, followed by a practical investigation in the third chapter. Utilizing quantitative and qualitative methods, data were collected through questionnaires administered to both teachers and students. The findings show that AI-powered personalized learning may have positive impacts on EFL teaching and learning process. Teachers demonstrated support for integrating AI technologies into the classroom, recognizing their potential to tailor educational experiences to individual student needs. The study also revealed that students have a positive attitude towards AI-driven personalized learning, appreciating its ability to address their unique learning preferences and challenges. Consequently, it is recommended that teachers incorporate AI technologies in their lesson planning, course content, and teaching materials to improve students' learning experiences and outcomes. Engaging students in AI-supported activities tailored to their individual learning needs can lead to greater academic success and language proficiency.

## 1. Pedagogical Implications

This study investigated teachers' and students' attitudes towards PL in the era of AI. The findings from the teachers' and students' questionnaires contributed to achieving a set of pedagogical implications that are detailed in the following lines. There are some implications for teachers, the faculty, and some instructions for EFL learners.

It is recommended for teachers to make their students aware of the concept of PL and its associated strategies, as well as the concept of Artificial Intelligence (AI) and its relevant skills because awareness is the first step of mastering. They might provide their students with activities that allow them to discover practical applications and engage in hands-on experiences, fostering a deeper understanding and proficiency in these areas. Moreover, instructors have to implement some strategies, such as the use of technological tools, competency-based education, and personal competencies that aim at developing their learners' personalized learning skills; since the participants agreed upon the importance of enhancing these skills in the development of their students' academic achievements. Furthermore, educators should inform their students about the application and benefits of AI tools in their studies. For example, they can inform their students about learning platforms that can tailor educational content to individual student needs, AI-powered platforms that can deliver personalized reading materials, writing prompts, and language exercises tailored to a student's proficiency level and AI tools that can highlight grammatical errors, suggest vocabulary improvements, and provide structural advice, helping students improve their writing skills.

For students, it is advisable to acknowledge the importance of personalized learning and artificial intelligence (AI) in their educational journey, as these tools can provide personalized learning experiences that meet individual needs and improve learning outcomes. Actively participating in personalized learning experiences and utilizing AI-driven tools can foster

critical thinking skills and enhance their overall academic performance. Additionally, engaging in collaborative discussions with peers and instructors within personalized learning environments, such as participating in online study groups where AI suggests relevant topics and resources based on individual progress can facilitate the exchange of ideas and perspectives, further enriching their learning experience and promoting proficiency in various subject areas. On the other hand, decision makers have the responsibility to integrate personalized learning and AI as a central educational aim across the curriculum. As a result, at this level, curricular designers have to implement some modules that are directed toward teaching personalized learning strategies and AI skills.

## 2. Limitations of the Study

Undoubtedly, research conduction encounters obstacles and difficulties that act as barriers to its successful completion. The current study is no exception, as various limitations constrained its progress and prevented us from having a deep investigation of the present topic. First, the researchers encountered challenges in finding recent resources related to both variables due to limited availability of free books online. It would be beneficial for the university to provide accessible platforms that offer authentic and reliable resources such as books, articles, or journals. Second, the teacher sample size was limited to 13 teachers because of the low response rate to the questionnaire. Many teachers either ignored the questionnaire or promised to answer but never did. Third, the students sample was limited to 100 students instead of 122 because of the low response rate to the questionnaire. Furthermore, data collection was intended to be done through interviews. However, due to unforeseen circumstances, including time limitation, limited availability of teachers and their refusal to participate necessitated a shift to the use of questionnaires to accommodate time constraints and secure broader participation.

### 3. Recommendations for Further Research

Through this study, valuable insights have been gained regarding the impact of AI-powered personalized learning on improving English as a Foreign Language (EFL) teaching and learning. While the perspectives and attitudes of both students and teachers were examined, there is room for future research to expand and enhance these insights. Therefore, the following areas hold potential for further investigation in subsequent studies.

- Further research is recommended to determine the influence of AI-powered personalized learning on students' learning outcomes.
- More study can be conducted to investigate EFL teachers' attitudes about EFL teaching through AI-based personalized learning tools.
- Examine the long-term impact of AI-powered personalized learning on student overall educational outcomes in EFL settings.
- Compare AI-powered personalized learning with traditional teaching methods to evaluate identify best practices.

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# APPENDICES

## Appendix A

## Teachers 'Questionnaire

Dear teachers,

You are kindly invited to answer the questionnaire, which is part of Master dissertation. The questionnaire aims at gathering data about EFL students' attitudes towards Personalized Learning in the Era of Artificial Intelligence. Your answers are of great value to our research, and will be treated with great confidentiality and anonymously.

Thank you for your collaboration!

Nedjouai Safa

Labadlia Achouak

Department of English Language

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University of 8 Mai 1945 Guelma

2024

**General Information**

1- Gender :

- Male ☐
- Female ☐

2- How long have you been teaching English ?

- Less than 5 years ☐
- 5-10 years ☐
- More than 10 years ☐

## Section one: Personalized Learning

**Experience with Personalized Learning**

3- On a scale of 1 to 5, how familiar are you with the concept of personalized learning?

| | | | | |
|---|---|---|---|---|
| 1(Not familiar at all) | 2 | 3 | 4 | 5 (Very familiar) |

4- What are your general attitudes towards personalized learning? (Why?)

- Very positive ☐
- Positive ☐
- Neutral ☐
- Negative ☐
- Very negative ☐

……

……

5- Which personalized learning techniques do you currently use in your classroom? (Select all that apply)

a) Differentiated instruction ☐

b) Project-based learning ☐

c) Flipped classroom ☐

d) Individual learning plans ☐

e) Others (Please mention ) ☐

……

……

6- What challenges do you face when implementing personalized learning in your classroom?

……

……

## Section 2: Artificial Intelligence

**Integration of Artificial Intelligence**

7- How familiar are you with artificial intelligence in education?

- Not familiar at all ☐
- Somewhat familiar ☐
- Very familiar ☐

8- Have you used any AI-powered educational tools or platforms in your teaching? (If yes, mention one)

a. Yes ☐ b. No ☐

……

## Section Three: Personalized Learning in the AI era

9- In what ways do you think AI can enhance personalized learning? (Select all that apply)

a) Adapting content to individual student needs ☐

b) Providing real-time feedback ☐

c) Automating administrative tasks ☐

d) Personalized tutoring ☐

e) Other (Please mention) ☐

……

……

**Challenges and Concerns**

10- What concerns do you have about the use of AI in education? (Select all that apply)

a) Privacy issues ☐

b) Equity and access concerns ☐

c) Loss of human touch in teaching ☐

d) Job displacement for teachers ☐

e) Other ☐

……

……

11- What challenges do you foresee in implementing personalized learning in the era of artificial intelligence?

a) Lack of resources ☐

b) Technological barriers ☐

c) Ethical concerns ☐

d) Resistance from stakeholders ☐

e) Other (please specify) ☐

……

……

**Future Outlook**

12- How can educational institutions effectively adopt personalized learning in the era of AI?

a) Provide training and resources for teachers ☐

b) Invest in AI-powered educational tools ☐

c) Develop clear policies and guidelines ☐

d) Collaborate with AI experts and researchers ☐

e) Other (please specify) ☐

……

……

**Additional Comments**

- Please share any additional thoughts or insights related to personalized learning and AI in education

……

**Thank you**

# APPENDICES

## Appendix B

## Students 'Questionnaire

Dear students,

You are kindly invited to answer the questionnaire which is part of Master dissertation. The questionnaire aims at gathering data about EFL students' attitudes towards Personalized Learning in the Era of Artificial Intelligence. Your answers are of great value to our research, and will be treated with great confidentiality and anonymously.

Thank you for your collaboration!

Nedjouai Safa

Labadlia Achouak

Department of English Language

Faculty of Letters and Languages

University of 8 Mai 1945 Guelma

2024

## Section One: General Information.

1- What is your age?

……

2- For how many years have you been studying English?

……

3- How do you consider is your level of English?

a. Beginner ☐

b. Intermediate ☐

c. Advanced ☐

4- How is your motivation to study English?

a. Low ☐

b. Average ☐

c. High ☐

## Section Two: The Use of Personalized Learning in EFL students' learning.

- Personalized learning is an educational approach that aims to customize learning for each student's strengths, needs, skills, and interests.

5- How familiar are you with the concept of Personalized Learning?

a. Very familiar ☐

b. Somewhat familiar ☐

c. Not familiar ☐

6- Have you ever participated in any personalized learning programs or platforms before?

Yes ☐ No ☐

If yes, which of these personalized learning programs have you used before?

a. Khan Academy ☐

b. IXL learning ☐

c. Duolingo ☐

If you use other programs you can mention them.

……..

7- Do you think that the use of Personalized Learning in EFL students' learning is useful?

Yes ☐ No ☐

8- Do you agree that the use of Personalized Learning facilitates the learning of EFL?

a. Strongly disagree ☐

b. Disagree ☐

c. Neither agree nor disagree ☐

d. Agree ☐

E. Strongly agree ☐

9- How effective do you consider personalized learning in enhancing your learning experience?

a. Not effective ☐

b. Moderately effective ☐

c. Effective ☐

d. Very effective ☐

## Section Three: Artificial Intelligence.

10- How would you define Artificial Intelligence in your own words?

……

11_ Have you used any educational tools or platforms that incorporate artificial intelligence?

Yes ☐ No ☐

12- How do you consider the role of the artificial intelligence in the learning process?

a. Not important ☐

b. Important ☐

c. Very important ☐

13- How often do you use Artificial Intelligence in your studies?

a. Never/Rarely ☐

b. Sometimes ☐

c. Often ☐

## Section Four: Students' Perspectives Towards the Use of AI in Personalized Learning.

14- Do you think artificial intelligence could enhance personalized learning experiences?

Yes ☐ No ☐

15- Do you agree that personalized learning with AI technologies is more effective than traditional classroom instruction?

a. Strongly disagree ☐

b. Disagree ☐

c. Neither agree nor disagree ☐

d. Agree ☐

E. Strongly agree ☐

16- Would you be open to trying personalized learning aided by AI technologies?

Yes ☐ No ☐

17_ How satisfied or dissatisfied you are about the use of AI on EFL students' Personalized Learning?

a. Very dissatisfied ☐

b. Dissatisfied ☐

c. Neither satisfied nor dissatisfied ☐

d. Satisfied ☐

e. Very satisfied ☐

- Is there anything else you would like to share about personalized learning, artificial intelligence, or your learning experiences in general?

……

**Thank you.**

**Résumé**

L'apprentissage personnalisé est une approche pédagogique qui vise à adapter l'enseignement aux besoins, objectifs et compétences individuels des apprenants. L'avancée rapide de l'intelligence artificielle a grandement contribué au développement du processus éducatif, permettant progressivement à l'apprentissage personnalisé de remplacer les méthodes d'enseignement traditionnelles. Dans de nombreuses classes d'anglais comme langue étrangère, les élèves ont des styles d'apprentissage et des préférences différents, et afin de faciliter l'apprenant et de répondre à leurs besoins, les enseignants ont commencé à utiliser un enseignement personnalisé. Cette dissertation vise à explorer les attitudes des enseignants et des étudiants envers l'apprentissage personnalisé à l'ère de l'intelligence artificielle. Elle cherche à déterminer si les enseignants et les étudiants ont des attitudes positives envers cette approche dans le contexte de l'IA. Pour atteindre cet objectif, une combinaison de méthodes quantitatives et qualitatives a été utilisée. Deux questionnaires ont été employés un a été distribué à 122 étudiants de première année de master choisis au hasard parmi l'ensemble de la population, et un a été administré à 19 enseignants de première année de master du Département des Lettres et de la Langue Anglaise à l'Université du 8 Mai 1945-Guelma. L'analyse et l'interprétation des données collectées ont révélé des attitudes positives parmi les enseignants et les étudiants envers l'approche de l'apprentissage personnalisé à l'ère de l'intelligence artificielle.

**ملخص**

**التعلم المخصص هو نهج تعليمي يهدف إلى تكييف التعليم وفقًا لاحتياجات وأهداف ومهارات المتعلمين الفردية. ساهم التقدم السريع في الذكاء الاصطناعي إلى حد بعيد في تطوير العملية التعليمية، مما ساعد تدريجيًا التعلم المخصص على استبدال طرق التدريس التقليدية. في العديد من أقسام اللغة الإنجليزية، قد يكون لدى الطلاب أنماط تفضيلات تعليمية مختلفة، ومن أجل تسهيل التعلم وتلبية احتياجاتهم، بدأ المعلمون في استخدام التعلم المخصص. تهدف هذه الدراسة إلى استكشاف مواقف كل من الأساتذة والطلبة في ما يخص التعلم المخصص في عصر الذكاء الاصطناعي. تسعى الدراسة إلى التحقيق فيما إذا كانت مواقف المعلمين والطلاب إيجابية تجاه نهج التعلم المخصص في عصر الذكاء الاصطناعي. لتحقيق هذا الهدف، تم إستخدام مزيج من الأساليب الكمية والنوعية. تم استخدام استبيانين وُزِّع واحد على 122 طالبًا من السنة الأولى ماستر تم اختيارهم عشوائيًا من بين جميع الطلاب وواحد إلى 19 معلمًا من السنة الأولى ماستر من قسم الأدب واللغة الإنجليزية بجامعة 8 ماي 1945 -قالمة. أظهر تحليل وتفسير البيانات المجمعة عن مواقف إيجابية بين المعلمين والطلاب تجاه نهج التعلم المخصص في عصر الذكاء الاصطناعي.**