# Personalized Learning Program

**LBYCPA1 - EEQ2**

MEMBERS

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## I. INTRODUCTION

Personalization in the context of personalized learning refers to pursuing progression which solely focuses on the individual's needs and requirements. This puts premium on the demands of the individuals' fluidity in their way of understanding and their choices. With learning, it is then the acquisition of knowledge from different kinds of sources. To fully state that an individual has learned a concept, he or she must be able to articulate the topic in his or her own words. This is one of the ways to fully determine if a student has fully grasped the topic. Combined, personalized learning pertains to a modified version of education with which the specific needs and goals of students are catered to, individually speaking, equating to a much more interactive and productive course of learning.

This approach is aimed towards the elevation of literacy necessary for students, as individuals, in the status quo. Personalized learning systems, albeit difficult to create and much less optimize, have been a branch of education that has gained notable recognition in the context of digital learning. This environment of teaching assesses specific aspects of a student's learning techniques like one's analytical process and level of creativity. As this differs from person to person, it is imperative to create a learning interface that is adaptive and categorizes user-given results to create patterns and individualize diagnostic teaching methods. This serves as the primary motivation in the creation of this project, where it is expected to be able to classify a user's level of expertise in Python-specific programming and provide interactive modules based on it.

The purpose of this paper is to elaborate on the details for each process from the conceptualization up to the actual application of the program. The following sections break down these elaborations based on specific topics to be discussed. Overall, the paper aims to paint a picture of the proposed project for the user, highlight important features, and discuss important details of the program in general.

# II. REVIEW OF RELATED LITERATURE

## An Operationalized Understanding of Personalized Learning

In this dissertation, the analysis of personalized learning as a concept was prioritized to create a descriptive analysis of what constitutes a personalized learning environment and how it is able to function properly to accomodate all types of learners, even those with disabilities. It was stated by James Basham and his team back in 2016 that personalized learning systems do not focus on technological functions and algorithms to function properly. Technology only serves as a medium for which the personalized learning environment is implemented, accessed, and monitored. Trends in the technological aspect like online and blended learning systems were stated to provide context to the advancements in online learning. These improvements were then used to support the claim that, although efficient and accessible, these technological trends alone cannot become the source of a personalized learning system. The adaptability of a program such as that would require real-time monitoring, visualizing, and personalizing educational materials based on the needs of each specific user which requires an evident implementation of student self-regulation throughout the learning environment. Basham also determined that with the implementation and further improvements of personalized learning systems, it has the potential to encourage commendable educational growth outcomes from its learners.

## Key Design Considerations for Personalized Learning on the Web

Technological advances in the field of education are constantly and rapidly progressing towards the actualization of an adaptive learning system. Margaret Martinez describes the crucial concepts required for this personalized learning system and how many important levels of understanding are still unavailable in most online learning environments. The study focuses on determining how students learn in online educational environments, how some may learn more than others, and what a proper personalized learning system needs to adapt to those types of situations. It was then determined that a comprehensive set of factors are necessary in identifying the key sources in the identification of individual learning variations.

## Python for Teaching Introductory Programming: A Quantitative Evaluation

This study focuses on two specific advances to teaching the fundamentals of Python programming using a quantitative approach to student assessments in a classroom. These two approaches to learning Python involve the emphasis of necessary principles and the introduction of basic programming concepts, features, and rules. It depicts experimental results when comparing the two proposed approaches to Python learning to determine the similarities and differences between them. Results showed a significant favoring of the second approach over the first that were based on specific criteria by the researchers. Although theoretically sound, the entire dissertation only considers one case study that may be contextual to an extent that would significantly manipulate the results shown at the end of the experiment.

# III. METHODS AND MATERIALS

## Python

Python is a high-level programming language widely used by students and businesses alike. Its simple interface and easy-to-learn syntax provides ample accessibility and potential for beginners and seasoned programmers to create programs of tremendous complexity. Python serves as the programming language of choice in the creation of the source code of the project. The course LBYCPA1 throughout the term has provided the fundamentals of Python programming along with the necessary analytical skills to assess and solve problems that most Python programmers encounter.

## Jupyter Notebook

The Jupyter Notebook is an online open-source workspace used for a multitude of documents, some of which include the visualization of ideas, statistical analyses, and in this case, programming with Python. This is the required platform for the project to be implemented and run on. This online application has been the workspace of all LBYCPA1 discussions this term and it was only fitting that the final project be in the format of a jupyter notebook file. Although effective on its own to serve as a place to code using Python, the Jupyter Notebook is too broad of an application to be able to efficiently experiment exclusively with Python functions. To address this need, the majority of the source codes were made using Python IDLE.

## Python IDLE

Python IDLE, also known as the Python Integrated Development and Learning Environment, is a multi-platform integrated development environment (IDE) exclusive for the Python programming language. It serves as an editor for Python which can be used to create and edit programs using the Python programming language. Aside from the Jupyter Notebook, this program is another IDE that is used in the creation of the personalized learning program as it provides a workspace to experiment with features and functions that could be implemented in the final draft of the project.

## Tkinter

Tkinter is Python's ideal interface used for the implementation of graphical user interfaces (GUI) in programs. Although it is not the only toolkit that allows the implementation of GUIs in Python, it is one of the most commonly known and widely used modules for this purpose. It allows easy application of widgets and other features associated with the module. This interface is what was used for the creation of the personalized learning program. Tutorials were provided to provide a modest introduction to the basics of Tkinter features and widgets. These tutorials served as lessons on how to create the project the way it is intended to be made.

## IV. DISCUSSION/CONCLUSION

The program in its completion serves as a humble start for the creation of personalized learning systems and programs alike. It operates as it should and seems to serve as a prudent reference material in learning about Python programming. Modules are properly distributed and most were made for users with a "beginner" proficiency level to put a premium on introducing users to Python programming rather than helping already experienced users improve their skills. Although the system works well and as intended, its overall interface could be greatly improved upon, especially in terms of design and optimization. Tkinter overall served as an effective learning tool and an interesting module to further improve the members' programming skills and problem-solving capabilities in the field of software design and creation. However, given that Tkinter was only introduced to the programmers recently and were not as adept in its functions and available features as one may suspect, the limits to the design of the program and its interface were greatly affected. This is hoped to be improved upon in the future, whether by the same programmers or different researchers aiming to create a similar system using the same functions and materials used in this one.

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